5. Above the bentonite seal, an annular seal of cement-bentonite grout will be placed. The cement-bentonite grout will be installed continuously in one operation from the bottom of the space to be grouted to the ground surface through a tremie pipe. The tremie pipe must be plugged at the bottom and have small openings along the sides of the bottom 1-foot length of pipe. This will allow the grout to discharge laterally into the borehole and not disturb the bentonite pellet seal.
6. Well Completion
7. For monitoring wells that will be completed above-grade, a locking steel protective casing set in a concrete pad will be installed. The steel protective casing will extend at least 2 feet into the ground and 3 feet above ground but should not penetrate the bentonite seal. The concrete pad will be square, approximately 2 feet per side (unless otherwise specified in the project plans) and poured into wooden forms. The concrete will be sloped away from the protective casing.
8. Guard posts may be installed in high-traffic areas for additional protection. Four steel guard posts will be installed around the protective casing, within the edges of the concrete pad. Guard posts will be concrete-filled, at least 2 inches in diameter, and will extend at least 2 feet into the ground and 3 feet above the ground. The protective casing and guard posts will be painted with an epoxy paint to prevent rust.
9. For monitoring wells with flush-mount completions, Morrison 9-inch or 12-inch 519 manhole cover or equivalent, with a rubber gasket and drain will be installed. The top of the manhole cover will be positioned approximately 1 inch above grade. A square concrete pad, approximately 2 feet per side (unless otherwise specified in the project plans), will be installed as a concrete collar surrounding the road box cover, and will slope uniformly downward to the adjacent grade. The road box and installation thereof will be of sufficient strength to withstand normal vehicular traffic.
10. Concrete pads installed at all wells will be a minimum of 6 inches below grade. The concrete pad will be 12-inches thick at the center and taper to 6-inch thick at the edge. The surface of the pad should slope away from the protective casing to prevent water from pooling around the casing. Protective casing, guard posts, and flush mounts will be installed into this concrete.
11. Each well will be properly labeled on the exterior of the locking cap or protective casing with a metal stamp indicating the permanent well number.

C. Well Development

1. Well development will be accomplished using a combination of surging throughout the well screen and pumping, until the physical and chemical parameters of the discharge water that are measured in the field have stabilized and the turbidity of the discharge water is substantially reduced. Fine-grained materials in the surficial aquifer at the site may not allow low turbidity results to be achieved.

2. The surging apparatus will include a tight-fitting surge block. Well development will begin by surging the well screen, starting at the bottom of the screen and proceeding upwards, throughout the screened zone. Following surging, the well will be pumped to remove the fine materials that have been drawn into the well. During pumping, measurements of pH, temperature, turbidity and specific conductance will be recorded.
3. Development will continue by alternately surging and pumping until the discharge water is free from sand and silt, the turbidity is substantially reduced, and the pH, temperature, and specific conductance have stabilized at regional background levels, based on historical data. Development will continue for a minimum of one hour until the water removed from the well is as clear of turbidity as practicable.
4. Well development equipment will be decontaminated prior to initial use and after the development of each well. Decontamination procedures are detailed in SOP *Decontamination of Personnel and Equipment*. Water generated during well development will be contained and managed as detailed in the SOP *Disposal of Waste Fluids and Solids* and the Investigation Derived Waste Management Plan.

IV. Attachments

- Schematic diagram of shallow monitoring well construction (MWSingleDiag.xls)

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PROJECT NUMBER	WELL NUMBER
	SHEET 1 OF 1

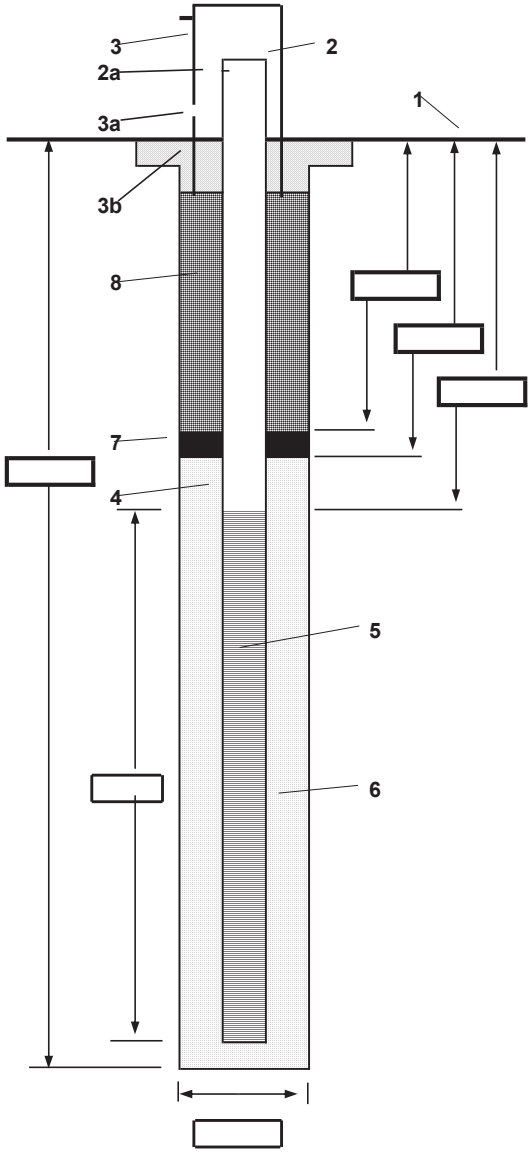
WELL COMPLETION DIAGRAM

PROJECT : LOCATION :

DRILLING CONTRACTOR :

DRILLING METHOD AND EQUIPMENT USED :

WATER LEVELS : START : END : LOGGER :



1- Ground elevation at well _____

2- Top of casing elevation _____
a) vent hole? _____

3- Wellhead protection cover type _____
a) weep hole? _____
b) concrete pad dimensions _____

4- Dia./type of well casing _____

5- Type/slot size of screen _____

6- Type screen filter _____
a) Quantity used _____

7- Type of seal _____
a) Quantity used _____

8- Grout
a) Grout mix used _____
b) Method of placement _____
c) Vol. of well casing grout _____

Development method _____

Development time _____

Estimated purge volume _____

Comments _____

Water-Level Measurements

I. Purpose and Scope

The purpose of this procedure is to provide a guideline for the measurement of the depth to groundwater in piezometers and monitoring wells, even where a second phase of floating liquid (e.g., gasoline) is encountered, and on staff gauges in surface-water bodies. This SOP includes guidelines for discrete measurements of static water levels and does not cover the use of continuously recording loggers (see SOP *Use of Data Loggers and Pressure Transducers)*.

II. Equipment and Materials

- Electronic water-level meter (Solinst® or equivalent) with a minimum 100-foot tape; the tape should have graduations in increments of 0.01 feet or less
- Interface probe (Solinst® Model 122 Interface Meter or equivalent)

III. Procedures and Guidelines

Verify that the unit is turned on and functioning properly. Slowly lower the probe on its cable into the piezometer or well until the probe just contacts the water surface; the unit will respond with a solid tone or light signal. Note the depth from a reference point indicated on the piezometer or well riser. Typically, this is the top of the PVC casing. If no reference is clearly visible, measure the depth to water from the northern edge of the PVC casing. If access to the top of the PVC casing is difficult, sight across the top of the locking casing adjacent to the measuring point, recording the position of the cable when the probe is at the water surface.

Measure the distance from this point to the closest interval marker on the tape and record the water level reading in the logbook. Water levels will be measured to the nearest 0.01-foot. Also, when specified in the project plans, measure and record the depth of the piezometer or well. The depth of the piezometer or well may be measured using the water-level probe with the instrument turned off.

Free product light or dense nonaqueous phase liquid may be present in the piezometer or well. If the presence of free product is suspected, the thickness of the product should be determined using appropriate equipment (e.g., Solinst® Model 122 Interface Meter). The depth to water also is determined with this equipment and the water-level meter should not be used in the piezometer or well as long as product is present. Typically, a constant sound is emitted from the device when free product is encountered and an alternating on/off beep sound is emitted when water is encountered.

The apparent elevation of the water level in the well or piezometer is determined by measuring both the apparent depth to water and the thickness of free product. The corrected water-level elevation is calculated by the following equation:

$WL_c = Wl_a$ + (Free-product thickness x 0.80)

Where WL_c = Corrected water-level elevation

Wl_a = Apparent water-level elevation

0.80 = Typical value for the density of petroleum hydrocarbon products.

If free product is detected on the surface of the water in the piezometer or well, the value of sampling should be reconsidered because of the potential for contaminating the sampling equipment.

Staff gauges may be installed in some surface-water bodies. These facilities typically are constructed by attaching a calibrated, marked staff gage to a wood or metal post, driving the post into the bottom of the surface-water body, and surveying the elevation of the top of the post to a resolution or 0.01-foot. The elevation of the water in the surface-water body then can be determined by reading off the distance the water level is from the top of the post. A shield or other protection may be needed to calm the fluctuations in water level if the gauge is installed at a location exposed to wind or wave.

IV. Attachments

None.

V. Key Checks

- Before each use, verify that the battery is charged by pressing the test button on the water-level meter.
- Verify that the unit is operating correctly by testing the probe in distilled or de-ionized water. Leave the unit turned off when not in use.

Civil Surveying

I. Purpose and Scope

The SOP describes survey procedures to be used on CLEAN projects. Modified third-order survey procedures will be used for most surveying. Geographic Positioning System techniques will be used for measurement of some horizontal coordinates. These procedures are general guidelines only and are in no way intended to replace the specifications in the surveyor's subcontract.

A. Records and Definitions

All field notes should be kept in bound books. Each book should have an index. Each page of field notes should be numbered and dated and should show the initials of all crew members. The person taking field notes will be identified in the log. Information on weather (wind speed/wind direction, cloud cover, etc.) and on other site conditions should also be entered in the notes. Notes should also include instrument field identification number and environmental settings. Graphite pencils or waterproof ballpoint pens should be used. Erasing is not acceptable; use a single-strike-through and initial it. The notekeeping format should conform to the Handbook of Survey Notekeeping by William Pafford. A survey work drawing with grid lines and at the scale of the topographic map should be prepared for all survey field work. Field notebooks will be available on site.

The following terms are defined to clarify discussion in this SOP:

- North American Datum (NAD) -The standard geodetic datum on the North American continent.
- National Geodetic Vertical Datum (NGVD) - The vertical-control datum used (1929 or later) by the National Geodetic Survey for vertical control.
- Horizontal Control - Horizontal location of an object from surveyed corners or other features on permanent land monuments in the immediate site area. Will be based on North American Datum (NAD) 1983 and state plane grid systems.
- Vertical Control - Vertical location of an object compared to the adjacent ground surface.
- Bench Mark - Precisely determined elevation above or below sea level. May also have horizontal control (northing, easting) determined for location.

II. Surveying

A. Horizontal Survey

Horizontal angular measurements shall be made with a 20-second or better theodolite or transit. When using a 20-second instrument the horizontal angles shall be turned four times (two each direct and inverted) with the mean of the fourth angle being within 5 seconds of the mean of the

second angle. When using a 10-second or better instrument the angles shall be doubled (once each direct and inverted), with the mean of the second angle within 5 seconds of the first angle. The minimum length of any traverse courses shall be 300 feet.

Distance measurements shall be made with a calibrated steel tape corrected for temperature and tension or a calibrated electronic distance meter (EDM). When using an EDM the parts per million (PPM), curvature and refraction corrections shall be made. Vertical angle measurements used for distance slope corrections shall be recorded to the nearest 20 seconds of arc deviation from the horizontal plane. Horizontal locations will be surveyed to within 0.05-foot of the true location.

Horizontal traverse stations shall be established and referenced for future use. All stations shall be described in the field notes with sufficient detail to facilitate their recovery at a later date. The station shall consist of a permanent mark scribed on facilities such as sidewalks, curbs, concrete slabs, or iron rod and cap.

The horizontal location will be referenced to NAD83 and the appropriate state plane grid system.

Some horizontal coordinates will be measured using Geographic Positioning System (GPS) equipment. This approach will be used in particular for determining the coordinates of surface-water and sediment sampling locations, and may be used also for determining the locations of piezometers and monitoring wells. The GPS survey will be performed by staff trained in the use of the equipment and will conform to guidance provided by the manufacturer.

B. Vertical Survey

When practical, vertical control will be referenced to the National Geodetic Vertical Datum (NGVD) of 1929, obtained from a permanent benchmark. If practical, level circuits should close on a known benchmark other than the starting benchmark. The following criteria shall be met in conducting the survey:

- Instruments shall be pegged weekly or after any time it is dropped or severely jolted.
- Foresight and backsight distances shall be reasonably balanced and shall not be greater than 250 feet in length.
- No side shot shall be used as a beginning or ending point in another level loop.
- Rod readings shall be made to 0.01-foot and estimated to 0.005-foot.
- Elevations shall be adjusted and recorded to 0.01-foot.

Temporary benchmarks (TBMs) shall be established and referenced for future use. All TBMs shall be described in the field notes with sufficient detail to facilitate their recovery at a later date. The TBMs shall consist of a permanent mark scribed on facilities such as sidewalks, curbs, concrete slabs, etc. or spikes set in the base of trees (not power poles), or tops of anchor bolts for transmission line towers, etc. (Horizontal traverse stations will not be considered as a TBM but may be used as a permanent turning point.)

1. Traverse Computations and Adjustments

   Traverses will be closed and adjusted in the following manner:

- Step One—Coordinate closures will be computed using unadjusted bearings and unadjusted field distances.
- Step Two—Coordinate positions will be adjusted (if the traverse closes within the specified limits) using the compass rule.
- Step Three—Final adjusted coordinates will be labeled as "adjusted coordinates." Field coordinates should be specifically identified as such.
- Step Four—The direction and length of the unadjusted error of closure, the ratio of error, and the method of adjustment shall be printed with the final adjusted coordinates.

2. Level Circuit Computations and Adjustments

   Level circuits will be closed and adjusted in the following manner:

   - For a single circuit, elevations will be adjusted proportionally, provided the raw closure is within the prescribed limits for the circuit.
   - In a level net where the elevation of a point is established by more than one circuit, the method of adjustment should consider the length of each circuit, the closure of each circuit, and the combined effect of all the separate circuit closures on the total net adjustments.

C. Piezometer and Monitoring-Well Surveys

Piezometer and monitoring-well locations will be surveyed only after the installation of the protective casing, which is set in concrete. The horizontal plane survey accuracy is +0.05-foot and is measured to any point on the protective-casing cover. The vertical plane survey must be accurate to +0.01-foot. The following two elevations will be measured at piezometers and monitoring wells:

- Top of the piezometer or well riser (not on the protective casing), preferably on the north side
- Ground surface, preferably on the north side of the well

If no notch or mark exists, the point at which the elevation was measured on the inner casing shall be described so that water-level measurements may be taken from the same location.

D. Grid Surveys

Selected soil boring locations may be located by the survey crew after the soil borings are complete. The selected borings will be staked in the field by the field team leader. The stake will be marked with the boring number for reference. The horizontal plane survey accuracy is + 1 foot and is measured to any point on the ground surface immediately adjacent to the stake.

Exhibit A. Standards for Modified Third-order Plane Surveys

Traverse	
Max Number of bearing course between azimuth checks	30
Astronomical bearings: standard error of results	6”
Azimuth closure at azimuth checkpoint not to exceed	20" $\sqrt{N}$
Standard error of the mean for length measurements	1 in 50,000
Position closure per loop in feet before azimuth adjustment	1:10,000
Leveling	
Levels error of closure per loop in feet	0.05 $\sqrt{M}$

N = the number of stations for carrying bearing

M = the distance in miles

Sampling Contents of Tanks and Drums

I. Scope and Application

This procedure provides an overview approach and guidelines for the routine sampling of drums and tanks. Its purpose is to describe standard procedures and precautions which are applied in sampling drums and tanks. Procedures for opening drums with the individual instruments are included in **Attachment D**.

The samples obtained may be used to obtain physical chemical or radiological data. The resulting data may be qualitative or quantitative in nature and are appropriate for use in preliminary surveys as well as confirmatory sampling.

II. Summary of Methods

Drums are generally sampled by means of sampling tubes such as glass sample tubes or COLIWASA samplers. In either case, the sampling tube is manually inserted into the waste material. A sample of the drum contents is withdrawn by the sampling device. Should a drum contain bottom sludge, a glass tube will be used to retrieve a sample of this as well.

Storage tank and tank trailers, because of their greater depths, require sampling devices that can be lowered from the top, filled at a particular depth, and then withdrawn. Such devices are a COLIWASA, a Kemmerer depth sampler, or a Bacon Bomb. Where samples of bottom sludge are desired, a gravity corer can be utilized. This heavy tube with a tapered nose piece will penetrate the sludge as it free falls through the tank.

III. Comments

The sampling of tanks, containers, and drums present unique problems not associated with environmental samples. Containers of this sort are generally closed except for small access ports, manways, or hatches on the larger vessels, or taps and bungs on smaller drums. The physical size, shape, construction material, and location of access limit the types of equipment and methods of collection that can be used.

When liquids are contained in sealed vessels, gas vapor pressure can build up, sludges can settle out, and density layerings (stratification) can develop. Bulging drums may be under pressure and extreme caution should be exercised. The potential exists for explosive reactions or the release of noxious gases when containers are opened. All vessels should be opened with extreme caution. Check the HSP for the level of personnel protection to be worn. A preliminary sampling of any headspace gases is warranted. As a minimum, a preliminary check with a MultiRAE or equivalent may be of aid in selecting a sampling method.

In most cases it is impossible to observe the contents of these sealed or partially sealed vessels. Since some layering or stratification is likely in any solution left undisturbed over time, a sample must be taken that represents the entire depth of the vessel.

IV. Required Equipment and Apparatus

1. **Health and safety equipment/materials:** As listed in the site safety plan.
2. **Sampling equipment:** COLIWASA, glass sample tubes, Kemmerer depth sampler, Bacon Bomb, gravity corer.
3. **Tools:** Rubber mallet, bung wrench, speed wrench with socket, etc., (all non-sparking), paint marker.
4. **Heavy equipment:** Backhoe equipped with explosion shield, drum grappler, and 3-foot copper-beryllium (non-sparking) spike with 6-inch collar (to puncture top of drums for sampling, if necessary).
5. **Sample Containers:** As specified in the field sampling plan.

V. Procedures

A. Drums

NOTE: DO NOT open more than one drum at a time. Each drum must be handled and sampled as a separate entity to reduce vapors in the sampling area.

1. Drums will be sampled on an area-by-area basis. Drums will be sampled after they have been placed in overpack drums but before they are transferred from the excavation to the onsite storage area.
2. Record, in logbook, all pertinent information from visual inspection of drum (e.g., physical condition, leaks, bulges, and labels). Label each drum with a unique identifying number.
3. If possible, stage drums for easy access.
4. If necessary, attach ground strap to drums and grounding point.
5. Remove any standing material (water, etc.) from container top.
6. Using non-sparking tools, carefully remove the bung or lid while monitoring air quality with appropriate instruments. If necessary (and as a last resort), the non-sparking spike affixed to the backhoe can also be used to puncture the drum for sampling. See Attachment D for method of drum opening. Record air-quality monitoring results.
7. When sampling a previously sealed vessel, a check should be made for the presence of bottom sludge. This is accomplished by measuring the depth to apparent bottom, then comparing it to the known interior depth.
8. Agitation to disrupt the layers and rehomogenize the sample is physically difficult and almost always undesirable. If the vessel is greater than 3 feet in depth (say, a 55-gallon drum), the appropriate sampling method is to slowly lower the sampling device (i.e., suction line of peristaltic pump, glass tube) in known increments of length. Discrete samples can be collected from various depths, then combined or analyzed separately. If the depth of the vessel is greater than the lift capacity of the pump, an at-depth water sampler, such as the Kemmerer or Bacon Bomb type, may be required.

9. Extract a representative sample from the drum using a glass rod, COLIWASA, Bacon Bomb, Kemmerer bottle, or gravity corer (See Attachments). Ensure that the entire depth of material is penetrated. Depending on the size of the opening of the drum, three to four takes should be collected from random locations across the drum surface, to ensure a representative sample. Any observed stratification must be recorded in logbook, including number and thickness of the layers and a conceptualized sketch.
10. Record a visual description of the sample (e.g., liquid, solid, color, viscosity, and percent layers).
11. When possible, sampling equipment (like glass tubes) should be expendable and be left inside the drum for disposal with drum contents, once sampling is completed.
12. Place lid, bung, cap, etc., back in place on drum. Tighten hand tight. If necessary, the sampling port can be sealed using a cork.
13. Wipe up spilled material with lab wipes. Wipe off sample containers.
14. Mark the drum with a unique sample identification number and date using a paint marker.
15. Samples will be handled as high hazard samples. Samples will be placed in containers defined according to the analytical needs, wiped clean, and then packed in paint cans for shipping. Packaging, labeling, and preparation for shipment procedures will follow procedures as specified in the field sampling plan.

B. Underground Storage Tanks

1. A sampling team of at least two people is required for sampling—one will collect samples, the other will relay required equipment and implements.
2. Sampling team will locate a sampling port on the tank. Personnel should be wearing appropriate protective clothing at this time and carrying sampling gear.
3. Do not attempt to climb down into tank. Sampling MUST BE accomplished from the top.
4. Collect a sample from the upper, middle, and lower section of the tank contents with one of the recommended sampling devices.
5. If compositing is necessary, ship samples to laboratory in separate containers for laboratory compositing.
6. Samples will be handled as hazardous. Samples will be placed in appropriate containers and packed with ice in a cooler. Packaging, labeling, and preparation for shipment will follow procedures specified in the field sampling plan.

C. Tank Trailers or Above-Ground Storage Tanks

1. A sampling team of two is required. One will collect samples, the other will relay required equipment and implements.

2. Samples will be collected through the manhole (hatch) on top of the tanker or the fill port. Do not open valves at the bottom. Before opening the hatch, check for a pressure gauge or release valve. Open the release valve slowly to bring the tank to atmospheric pressure.
3. If tank pressure is too great, or venting releases large amounts of toxic gas, discontinue venting and sampling immediately. Measure vented gas with organic vapor analyzer and explosimeter.
4. If no release valve exists, slowly loosen hatch cover bolts to relieve pressure in the tank. (Again, stop if pressure is too great.)
5. Once pressure in tank has been relieved, open the hatch and withdraw sample using one of the recommended sampling devices.
6. Sample each trailer compartment.
7. If compositing is necessary, ship samples to laboratory in separate containers for laboratory compositing.
8. Samples will be handled as hazardous. Samples will be placed in appropriate containers and packed with ice in a cooler. Packaging, labeling, and preparation for shipment will follow procedures specified in the field sampling plan.

D. Refer to Attachment B for procedures for sampling with appropriate devices as follows:

1. Drum

Glass tube	Procedure 1
COLIWASA	Procedure 2

2. Storage Tank and Tank Trailer

COLIWASA	Procedure 2
Bacon Bomb	Procedure 3
Gravity Corer (for bottom sludge)	Procedure 4

E. Contamination Control

Sampling tools, instruments, and equipment will be protected from sources of contamination prior to use and decontaminated after use as specified in SOP *Decontamination of Personnel and Equipment*. Liquids and materials from decontamination operations will be handled in accordance with the waste management plan. Sample containers will be protected from sources of contamination. Sampling personnel shall wear chemical resistant gloves when handling any samples. Gloves will be decontaminated or disposed of between samples.

F. Attachments

1. Collection of Liquid-Containerized Wastes Using Glass Tubes
2. Sampling Containerized Wastes Using the Composite Liquid Waste Sample (COLIWASA)
3. Sampling Containerized Wastes Using the Bacon Bomb Sampler
4. Gravity Corer for sampling Sludges in Large Containers
5. Construction of a Typical COLIWASA
6. Drum Opening Techniques and Equipment

G. References

A Compendium of Superfund Field Operations Methods, EPA/540/P-87/001, U.S. Environmental Protection Agency, Washington, D.C., 1987.

Data Quality Objectives for Remedial Activities - Development Process, EPA/540/G-87/003, U.S. Environmental Protection Agency, Washington, D.C., 1987.

Annual Book of ASTM Standards, *Standard Recommended Practices for Sampling Industrial Chemicals*, ASTM-E-300, 1986.

Test Method for Evaluating Solid Waste, SW-846, Volume II, Field Methods, Second Edition, U.S. Environmental Protection Agency, Washington, D.C., 1982.

U.S. Environmental Protection Agency, *Characterization of Hazardous Waste Sites — A Method Manual: Volume II, Available Sampling Methods*, USEPA Environmental Monitoring Systems Laboratory, Las Vegas, EPA-600/4-84-076, December, 1984.

Environmental Surveillance Procedures, Quality Control Program, Martin Marietta Energy Systems, ESH/Sub/87-21706/1, Oak Ridge, TN, September 1988.

VI. Field Checklist

_____ Sampling Instruments

_____ Tools

_____ Rubber Mallet

_____ Logbook

_____ Safety Glasses or Monogoggles

_____ Safety Shoes

_____ Ice/Cooler, as required

_____ Custody Seals, as required

_____ Chain-of-Custody Forms

_____ Drum Labels, as required

_____ Paint Marker, if drum sampling

_____ Black Indelible Pen

_____ Monitoring Instruments

_____ Labels

_____ Sampling and Analysis Plan

_____ Health and Safety Plan

_____ Decontamination Equipment

_____ Lab Wipes

_____ Lab Spatulas or Stainless Steel Spoons

_____ Chemical Preservatives, as required

_____ Appropriate Containers for Waste and Equipment

_____ Duct Tape

_____ Plastic Sheeting

ATTACHMENT A

Collection of Liquid-Containerized Wastes Using Glass Tubes

I. Discussion

Liquid samples from opened containers (i.e., 55-gallon drums) are collected using lengths of glass tubing. The glass tubes are normally 122 centimeters long and 6 to 16 millimeters inside diameter. Larger diameter tubes may be used for more viscous fluids if sampling with the small diameter tube is not adequate. The tubing is broken and discarded in the container after the sample has been collected, eliminating difficult cleanup and disposal problems. This method should not be attempted with less than a two-person sampling team.

A. Uses

This method provides for a quick, relatively inexpensive means of collecting concentrated containerized wastes. The major disadvantage is from potential sample loss that is especially prevalent when sampling low-viscosity fluids. Splashing can also be a problem and proper protective clothing should always be worn.

Note: A flexible tube with an aspirator attached is an alternative method to the glass tube and allows various levels to be sampled discretely.

B. Procedures for Use

1. Remove cover from sample container.
2. Insert glass tubing almost to the bottom of the container. Tubing should be of sufficient length so that at least 30 centimeters extend above the top of the container.
3. Allow the waste in the drum to reach its natural level in the tube.
4. Cap the top of the tube with a safety-gloved thumb or a stopper.
5. Carefully remove the capped tube from the drum. If the tube has passed through more than one layer, the boundary should be apparent in the glass tube.
6. Insert the bottom, uncapped end into the sample container.
7. Partially release the thumb or stopper on the top of the tube and allow the sample to slowly flow into the sample container. If separation of phases is desired, cap off tube before the bottom phase has completely emptied. It may be advisable to have an extra container for “waste,” so that the fluid on either side of the phase boundary can be directed into a separate container, allowing collection of pure phase liquids in the sample containers. The liquid remaining after the boundary fluid is removed is collected in yet a third container. NOTE: It is not necessary to put phases in separate containers if analysis of separate phases is not desired.

8. Repeat steps 2 through 6 if more volume is needed to fill the sample container.

9. Remove the tube from the sample container and replace the tube in the drum, breaking it, if necessary, in order to dispose of it in the drum.

Optional Method (if sample of bottom sludge is desired)

1. Remove the cover from the container opening.

2. Insert glass tubing slowly almost to the bottom of the container. Tubing should be of sufficient length so that at least 30 cm extends above the top of the container.

3. Allow the waste in the drum to reach its natural level in the tube.

4. Gently push the tube towards the bottom of the drum into the sludge layer. Do not force it.

5. Cap the top of the tube with a safety-gloved thumb or stopper.

6. Carefully remove the capped tube from the drum and insert the uncapped end into the sample container.

7. Release the thumb or stopper on the top of the tube and allow the sample container to fill to approximately 90 percent of its capacity. If necessary, the sludge plug in the bottom of the tube can be dislodged with the aid of the stainless-steel laboratory spatula.

8. Repeat if more volume is needed to fill sample container and recap the tube.

Note:

1. If a reaction is observed when the glass tube is inserted (violent agitation, smoke, light, etc.), the investigators should leave the area immediately.

2. If the glass tube becomes cloudy or smoky after insertion into the drum, the presence of hydrofluoric acid maybe indicated, and a comparable length of rigid plastic tubing should be used to collect the sample.

3. When a solid is encountered in a drum (either layer or bottom sludge) the optional method described above may be used to collect a core of the material, or the material may be collected with a disposable scoop attached to a length of wooden or plastic rod.

ATTACHMENT B

Sampling Containerized Wastes using the Composite Liquid Waste Sampler (COLIWASA)

I. Discussion

The COLIWASA is a much-cited sampler designed to permit representative sampling of multiphase wastes from drums and other containerized wastes. The sampler is commercially available or can be easily fabricated from a variety of materials, including PVC, glass, or Teflon. In its usual configuration it consists of a 152 cm by 4 cm (inside diameter) section of tubing with a neoprene stopper at one end attached by a rod running the length of the tube to a locking mechanism at the other end. Manipulation of the locking mechanism opens and closes the sampler by raising and lowering the neoprene stopper. See Attachment E: Construction of a COLIWASA.

II. Uses

The COLIWASA is primarily used to sample containerized liquids. The PVC COLIWASA is reported to be able to sample most containerized liquid wastes except for those containing ketones, nitrobenzene, dimethylforamide, mesityloxide, and tetrahydrofuran. A glass COLIWASA is able to handle all wastes unable to be sampled with the plastic unit except strong alkali and hydrofluoric acid solutions. Due to the unknown nature of many containerized wastes, it would therefore be advisable to eliminate the use of PVC materials and use samplers composed of glass or Teflon.

The major drawback associated with using a COLIWASA is concern for decontamination and costs. The sampler is difficult, if not impossible, to decontaminate in the field, and its high cost in relation to alternative procedures (glass tubes) makes it an impractical throwaway item. It still has applications, however, especially in instances where a true representation of a multiphase waste is absolutely necessary.

III. Procedures for Use

1. Check to make sure the sampler is functioning properly. Adjust the locking mechanism, if present, to make sure the neoprene rubber stopper provides a tight closure.
2. Put the sampler in the open position by placing the stopper rod handle in the T-position and pushing the rod down until the handle sits against the sampler's locking block.
3. Slowly lower the sampler into the liquid waste. Lower the sampler at a rate that permits the levels of the liquid inside and outside the sampler tube to be about the same. If the level of the liquid in the sample tube is lower than that outside the sampler, the sampling rate is too fast and will result in a non-representative sample.
4. When the sampler stopper hits the bottom of the waste container, push the sampler tube downward against the stopper to close the sampler. Lock the sampler in the closed position by turning the T-handle until it is upright and one end rests tightly on the locking block.

5. Slowly withdraw the sampler from the waste container with one hand while wiping the sampler tube with a laboratory wipe with the other hand. A phase boundary, if present, can be observed through the tube.

6. Carefully discharge the sample into a suitable sample container by slowly pulling the lower end of the T-handle away from the locking block while the lower end of the sampler is positioned in a sample container.

7. Unscrew the T-handle of the sampler and disengage the locking block.

ATTACHMENT C

Sampling Containerized Wastes using the Bacon Bomb Sampler

I. Discussion

The Bacon Bomb is designed for the withdrawal of samples from various levels within a storage tank. It consists of a cylindrical body with an internal tapered plunger that acts as a valve to admit the sample. A line attached to the top of the plunger is used to open and close the valve. A removable cover provides a point of attachment for the sample line and has a locking mechanism to keep the plunger closed after sampling. The Bacon Bomb is usually constructed of chrome-plated brass and bronze with a rubber O-ring acting as the plunger-sealing surface. Stainless steel versions are also available. The volumetric capacity is 8, 16, or 32 oz (237, 473, or 946 ml).

II. Uses

The Bacon Bomb is a heavy sampler suited best for viscous materials held in large storage tanks or in lagoons. If a more non-reactive sampler is needed, the stainless steel version would be used, or any of the samplers could be coated with Teflon.

III. Procedures for Use

1. Attach the sample line and the plunger line to the sampler.
2. Measure and then mark the sampling line at the desired depth.
3. Gradually lower the sampler by the sample line until the desired level is reached.
4. When the desired level is reached, pull up on the plunger line and allow the sampler to fill for a sufficient length of time before releasing the plunger line to seal off the sampler.
5. Retrieve the sampler by the sample line, being careful not to pull up on the plunger line, thereby accidentally opening the bottom valve.
6. Wipe off the exterior of the sampler body.
7. Position the sampler over the sample container and release its contents by pulling up on the plunger line.

ATTACHMENT D

Gravity Corer for Sampling Sludges in Large Containers

I. Discussion

A gravity corer is a metal tube with a replaceable tapered nosepiece on the bottom and a ball or other type of check valve on the top. The check valve allows water to pass through the corer on descent but prevents a washout during recovery. The tapered nosepiece facilitates cutting and reduces core disturbance during penetration. Most corers are constructed of brass or steel and many can accept plastic liners and additional weights.

II. Uses

Corers are capable of collecting samples of most sludges and sediments. They collect essentially undisturbed samples that represent the strata profile that may develop in sediments and sludges during variations in the deposition process. Depending on the density of the substrate and the weight of the corer, penetration to depths of 75 cm (30 in.) can be attained. Exercise care when using gravity corers in vessels or lagoons that have liners because penetration depths could exceed those of the substrate; this could result in damage to the liner material.

III. Procedures for Use

1. Attach a precleaned corer to the required length of sample line. Solid braided 5-mm (3/16-in.) nylon line is sufficient; however, 20-mm (3/4-in.) nylon is easier to grasp during hand hoisting. An additional weight can be attached to the outside of the corer if necessary.
2. Secure the free end of the line to a fixed support to prevent accidental loss of the corer.
3. Allow corer to free fall through the liquid to the bottom.
4. Retrieve corer with a smooth, continuous, up-lifting motion. Do not bump corer because this may result in some sample loss.
5. Remove nosepiece from corer and slide sample out of corer into stainless steel or Teflon pan (preferred).
6. Transfer sample into appropriate sample bottle with a stainless steel lab spoon or laboratory spatula.

ATTACHMENT E

Construction of a Typical COLIWASA

The sampling tube consists of a 1.52-m (5-ft) by 4.13-cm (1-5/8 in) I.D. translucent plastic pipe, usually polyvinyl chloride (PVC) or borosilicate glass plumbing tube. The closure-locking mechanism consists of a short-length, channeled aluminum bar attached to the sampler's stopper rod by an adjustable swivel. The aluminum bar serves both as a T-handle and lock for the samplers' closure system. When the sampler is in the open position, the handle is placed in the T-position and pushed down against the locking block. This manipulation pushes out the neoprene stopper and opens at the sampling tube. In the closed position, the handle is rotated until one leg of the T is squarely perpendicular against the locking block. This tightly seats the neoprene stopper against the bottom opening of he sampling tube and positively locks the sampler in the closed position. The closure tension can be adjusted by shortening or lengthening the stopper rod by screwing it in or out of the T-handle swivel. The closure system of the sampler consists of a sharply tapered neoprene stopper attached to a 0.95-cm (3/8-in) O.D. rod, usually PVC. The upper end of the stopper rod is connected to the swivel of the aluminum T-handle. The sharply tapered neoprene stopper can be fabricated according to specifications by plastic-products manufacturers at an extremely high price, or it can be made in-house by grinding down the inexpensive stopper with a shop grinder.

COLIWASA samplers are typically made out of plastic or glass. The plastic type consists of translucent plastic (usually PVC) sampling tube. The glass COLIWASA uses borosilicate glass plumbing pipe as the sampling tube and a Teflon plastic stopper rod. For purpose of multiphase sampling, clear plastic or glass is desirable in order to observe the profile of the multiphase liquid.

The sampler is assembled as follows:

- Attach the swivel to the T-handle with the 3.18-cm (1-1/4 in) long bolt and secure with the 0.48-cm (3/16-in) National Coarse (NC) washer and lock nut.
- Attach the PFTE stopper to one end of the stopper rod and secure with the 0.95-cm (3/8-in) washer and lock nut.
- Install the stopper and stopper rod assembly in the sampling tube.
- Secure the locking block sleeve on the block with glue or screw. This block can also be fashioned by shaping a solid plastic rod on a lathe to the required dimension.
- Position the locking block on top of the sampling tube such that the sleeveless portion of the block fits inside the tube, the sleeve sits against the top end of the tube, and the upper end of the stopper rod slips though the center hole of the block.
- Attach the upper end of the stopper rod to the swivel of the T-handle.
- Place the sampler in the close position and adjust the tension on the stopper by screwing the T-handle in or out.

ATTACHMENT F

Drum Opening Techniques and Equipment [1]

I. Introduction

The opening of closed drums prior to sampling entails considerable risk if not done with the proper techniques, tools, and safety equipment. The potential for vapor exposure, skin exposure due to splash or spraying, or even explosion resulting from sparks produced by friction of the tools against the drum, necessitate caution when opening any closed container. Both manual drum opening and remote drum opening will be discussed in the following paragraphs. When drums are opened manually risks are greater than when opened remotely; for this reason, the remote opening of drums is advised whenever possible.

Prior to sampling, the drums should be staged to allow easy access. Also, any standing water or other material should be removed from the container top so that the representative nature of the sample is not compromised when the container is opened. There is also the possibility of encountering a water-reactive substance.

II. Manual Drum Opening

A. Bung Wrench

A common method for opening drums manually is using a universal bung wrench. These wrenches have fittings made to remove nearly all commonly encountered bungs. They are usually constructed of cast iron, brass, or a bronze-beryllium (a non-sparking alloy formulated to reduce the likelihood of sparks). The use of bung wrenches marked “NON SPARKING” is encouraged. However, the use of a “NON SPARKING” wrench does not completely eliminate the possibility of spark being produced. Such a wrench only prevents a spark caused by wrench-to-bung friction, but it cannot prevent sparking between the threads on the drum and the bung.

A simple tool to use, the fitting on the bung wrench matching the bung to be removed is inserted into the bung and the tool is turned counterclockwise to remove the bung. Since the contents of some drums may be under pressure (especially, when the ambient temperature is high), the bung should be turned very slowly. If any hissing is heard, the person opening the drum should back off and wait for the hissing to stop. Since drums under pressure can spray out liquids when opened, the wearing of appropriate eye and skin protection in addition to respiratory protection is critical.

B. Drum Deheader

One means by which a drum can be opened manually when a bung is not removable with a bung wrench is by using a drum deheader. This tool is constructed of forged steel with an alloy steel blade and is designed to cut the lid of a drum off or part way off by means of a scissors-like cutting action. A limitation of this device is that it can be attached only to closed head drums (i.e.,

1 Taken from EPA Training Course: “Sampling for Hazardous Materials,” U.S. Environmental Protection Agency, Office of Emergency and Remedial Response Support Division, March 24, 1987.

DOT Specification 17E and 17F drums); drums with removable heads must be opened by other means.

Drums are opened with a drum deheader by first positioning the cutting edge just inside the top chime and then tightening the adjustment screw so that the deheader is held against the side of the drum. Moving the handle of the deheader up and down while sliding the deheader along the chime will enable the entire top to be rapidly cut off if so desired. If the top chime of a drum has been damaged or badly dented it may not be possible to cut the entire top off. Since there is always the possibility that a drum may be under pressure, the initial cut should be made very slowly to allow for the gradual release of any built-up pressure. A safer technique would be to employ a remote pressure release method prior to using the deheader.

C. Hand Pick or Spike

When a drum must be opened and neither a bung wrench nor a drum deheader is suitable, then it can be opened for sampling by using a hand pick, pickaxe, or spike. These tools are usually constructed of brass or a non-sparking alloy with a sharpened point that can penetrate the drum lid or head when the tool is swung. The hand picks or pickaxes that are most commonly used are commercially available, whereas the spikes are generally uniquely fabricated 4-ft long poles with a pointed end. Often the drum lid or head must be hit with a great deal of force in order to penetrate it. Because of this, the potential for splash or spraying is greater than with other opening methods and therefore this method of drum opening is not recommended, particularly when opening drums containing liquids. Some spikes used for drum opening have been modified by the addition of a circular splash plate near the penetrating end. This plate acts as a shield and reduces the amount of splash in the direction of the person using the spike. Even with this shield, good splash gear is essential.

Since drums, some of which may be under pressure, cannot be opened slowly with these tools, “sprayers” may result and appropriate safety measures must be taken. The pick or spike should be decontaminated after each drum is opened to avoid cross contamination and/or adverse chemical reaction from incompatible materials.

III. Remote Opening

A. Backhoe Spike

The most common means used to open drums remotely for sampling is the use of a metal spike attached or welded to a backhoe bucket. In addition to being very efficient, this method can greatly reduce the likelihood of personnel exposure.

Drums should be “staged,” or placed in rows with adequate aisle space to allow ease in backhoe maneuvering. Once staged, the drums can be quickly opened by punching a hole in the drum head or lid with the spike.

The spike should be decontaminated after each drum is opened to prevent cross contamination. Even though some splash or spray may occur when this method is used, the operator of the backhoe can be protected by mounting a large shatter-resistant shield in front of the operator’s cage. This, combined with the normal sampling safety gear, should be sufficient to protect the

operator. Additional respiratory protection can be afforded by providing the operator with an on-board airline system. The hole in the drum can be sealed with a cork.

B. Hydraulic Devices

Recently, remotely operated hydraulic devices have been fabricated to open drums remotely. One such device is discussed here. This device uses hydraulic pressure to pierce through the wall of a drum. It consists of a manually operated pump that pressurizes oil through a length of hydraulic line. A piercing device with a metal point is attached to the end of this line and is pushed into the drum by the hydraulic pressure. The piercing device can be attached so that a hole for sampling can be made in either the side or the head/lid of the drum. Some of the metal piercers are hollow or tube-like so that they can be left in place, if desired, and serve as a permanent tap or sampling port. The piercer is designed to establish a tight seal after penetrating the container.

C. Pneumatic Devices

Pneumatically-operated devices utilizing compressed air have been designed to remove drum bungs remotely. A pneumatic bung remover consists of a compressed air supply (usually SCBA cylinders) that is controlled by a heavy-duty, 2-stage regulator. A high pressure air line of desired length delivers compressed air to a pneumatic drill that is adapted to turn a bung fitting (preferably, a bronze-beryllium alloy) selected to fit the bung to be removed. An adjustable bracketing system has been designed to position and align the pneumatic drill over the bung. This bracketing system must be attached to the drum before the drill can be operated. Once the bung has been loosened, the bracketing system must be removed before the drum can be sampled. This attachment and removal procedure is time- consuming and is the major drawback of this device. This remote bung opener does not permit the slow venting of the container, and therefore appropriate precautions must be taken. It also requires the container to be upright and relatively level. Bungs that are rusted shut cannot be removed with this device.

IV. Summary

The opening of closed containers is one of the most hazardous site activities. Maximum efforts would be made to ensure the safety of the sampling team. Proper protective equipment and a general wariness of the possible dangers will minimize the risk inherent to sampling operations. Employing proper drum opening techniques and equipment will also safeguard personnel. The use of remote sampling equipment whenever feasible is highly recommended.

Global Positioning System

I. Purpose

The procedure describes the calibration, operation, and functions associated with a Trimble® GeoExplorer® 6000 series. The GeoExplorer 6000 series includes the GeoXH™ and GeoXT™ handhelds. These handhelds combine a Trimble GNSS receiver with a field computer powered by Microsoft Windows Mobile version 6.5 operating system. If using a different instrument, the operation manual supplied by the manufacturer should be consulted for instructions.

II. Scope

This procedure provides information regarding the field operation and general maintenance of a Trimble® GeoExplorer® 6000 series. The information contained herein presents the operation procedures for this equipment. Review of the equipment's instruction manual is a necessity for more detailed descriptions pertaining to the operation and maintenance of the equipment.

III. Definitions

GPS: Global Positioning System - A system of satellites developed and operated by the US DOD. Continuous 3D coordinate information is broadcast free of charge on a worldwide basis enabling precise positional location. The GeoExplorer 6000 series handheld includes an integrated GNSS receiver that enables the collection of GPS and GLONASS data for incorporating into a GIS or for managing assets.

GPS (Global Positioning System) and GLONASS (GLObal NAvigation Satellite System) are Global Navigation Satellite Systems (GNSS). Each system consists of a constellation of satellites that orbit the earth. GNSS provides worldwide, all-weather, 24-hour time and position information.

IV. Procedures and Guidelines

The procedure for calibration, operation, and maintenance of the GPS unit is outlined below. Daily calibration and battery recharging is typical operating procedure; frequencies other than daily shall be noted in the logbook and reason for increased frequency recorded. If using a different instrument, the operation manual supplied by the manufacturer should be consulted for instructions.

The procedures described below include additional features pre-programmed into the GPS datalogger to aid the data collection process.

A. GeoExplorer 6000 Unit

Parts of the GeoExplorer 6000 series handheld

The following diagrams show the main parts of the handheld.

Keypad buttons

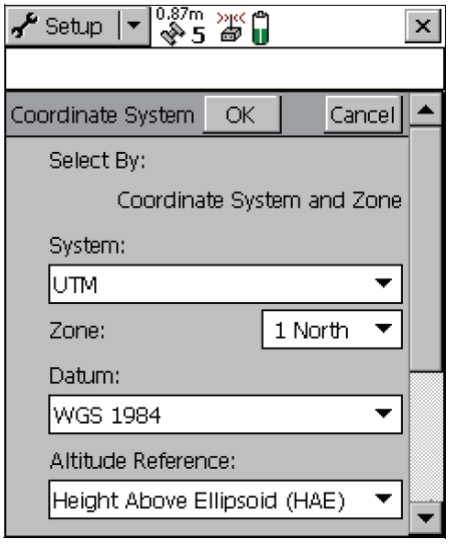
The GeoExplorer 6000 series handheld has a keypad for fast, easy access to common actions. LEDs provide visual notifications of system events.

B. Operations for Surveying Coordinates of a Location

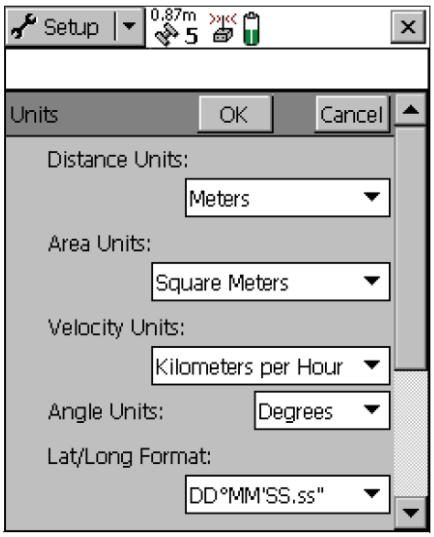
The TerraSync software consists of five sections as described below:

Use this section ...	to ...
 Map	view features, background files, and the GPS trail graphically
 Data	work with data files: • create a new data file or open an existing data file • log base station data to file or broadcast real-time corrections • collect new features or maintain existing features • move, copy, delete, or rename data and background files
 Navigation	navigate to features using the *Direction Dial* and *Close-up* screens, or the graphical lightbar
 Status	view information about: • the satellites the TerraSync software is tracking, their relative positions in the sky, and your current position • the predicted satellite constellation and position quality over the next 12 hours • communication ports that the TerraSync software is using • your GPS receiver and real-time correction source • the current UTC time • the TerraSync software version and trademark information
 Setup	configure the TerraSync software

1. Configure coordinate settings: To open the **Coordinate System** form, tap Coordinate System in the Setup screen. Use this form to specify the coordinate system you want the TerraSync software to display foreground and background files.



2. Configure unit settings: To open Units form, tap Units in the Setup screen. Use this form to specify the units used for measurements and display.



3. Starting the TerraSync Software:

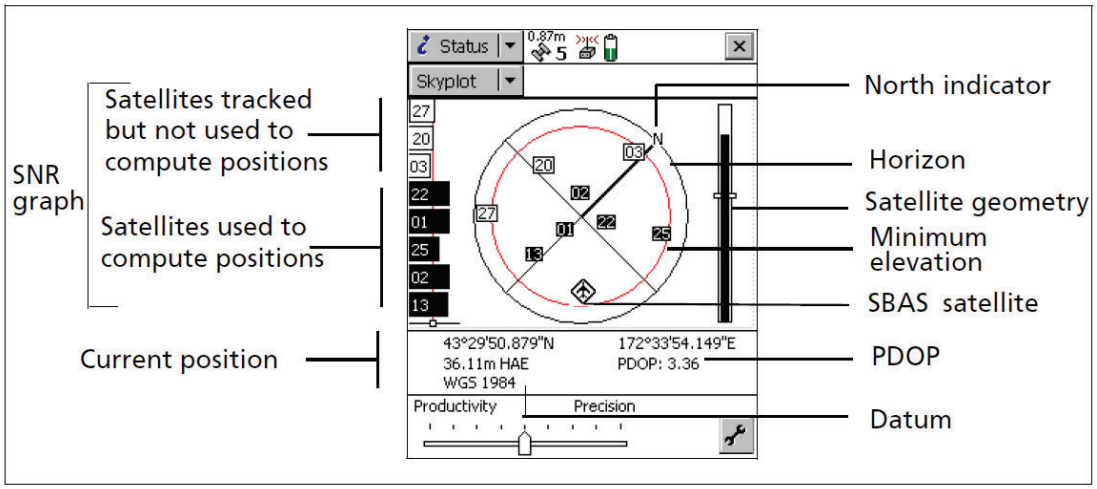
   - When you are outside and ready to begin, switch on your data collector and start the TerraSync software. The GPS receiver should activate automatically.
   - On the Microsoft Windows® or Windows Mobile® taskbar, tap the windows icon and the select Programs/TerraSync. While the software is loading, a Trimble identification screen appears.

4. Getting a clear view of the sky. Move to a location where the receiver has a clear view of the sky. Signals can be received from any direction. Satellite signals can be blocked by

people, buildings, heavy tree cover, large vehicles, or powerful transmitters. GPS signals can go through leaves, plastic, and glass, but they will weaken the signal.

5. Checking the GPS status. When you start the TerraSync software, it automatically connects to the GPS receiver and begins to track visible satellites to calculate its current position. Use the satellite icon on the status bar to check whether the receiver is computing GPS positions.

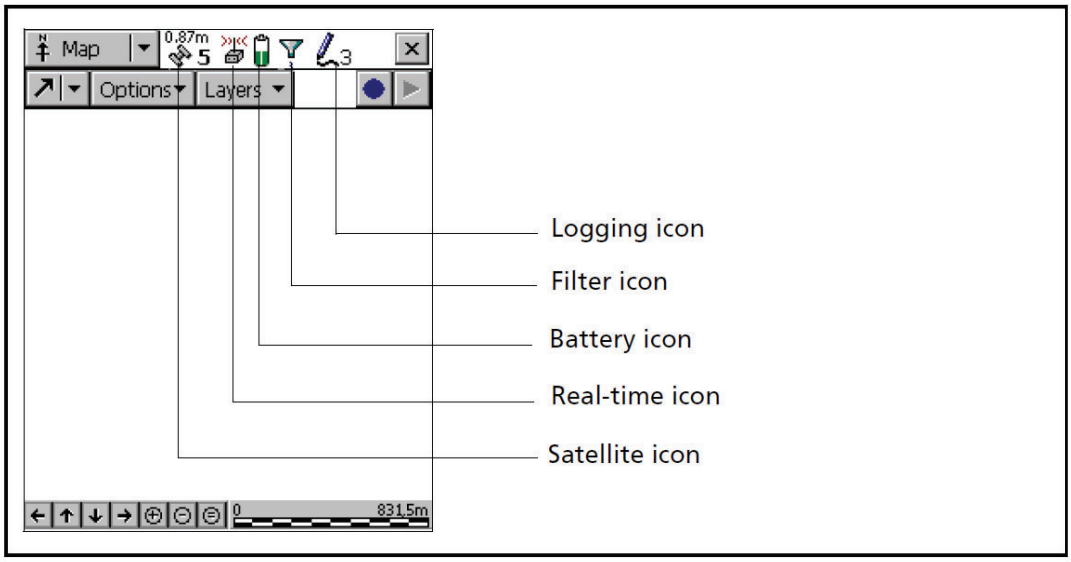
6. To view the GPS status: The Skyplot screen appears when you first run the TerraSync software. If this screen is not visible, tap the Section button, select Status, tap the Subsection list button and then select Skyplot.



- Filled black boxes represent satellites that the receiver is using to compute its current GPS position.
- White boxes represent satellites that the receiver is getting signals from but is not using because the signals are too weak.

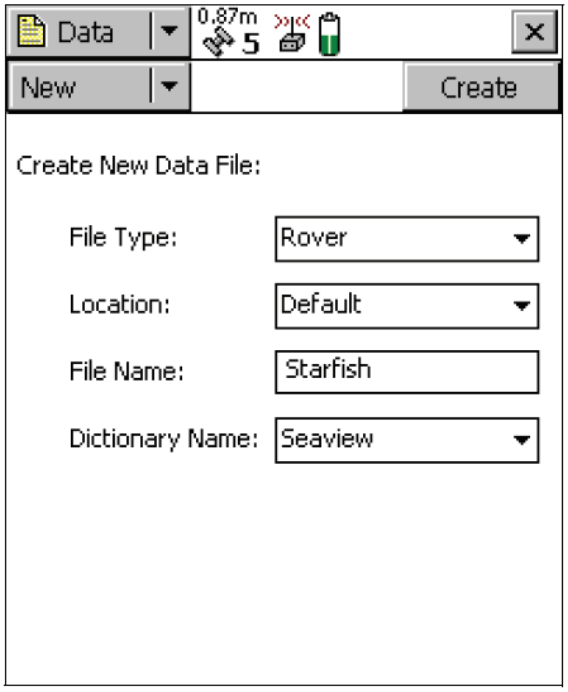
7. You need a minimum of four satellites with good geometry to computer a 3D GPS position.

8. Status Bar: The status bar appears in the top row of the TerraSync screen. It is always visible, but the icons displayed depend on the current status of the TerraSync software.

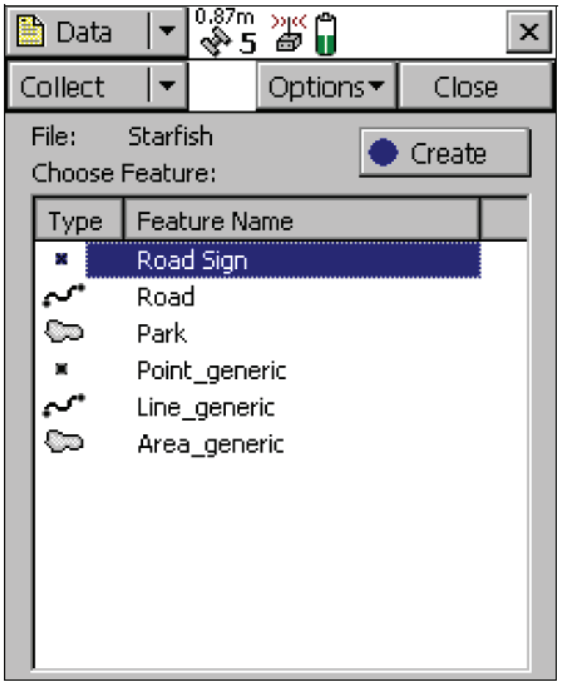


9. Creating a New Data File: Before starting the data collection session, you need t create a new data file to store the new features and attributes you collect. Use the Data section to do this.

   - Tap the Section list button and then select Data
   - Tap the Subsection list button and then select New.



- In the Dictionary Name field, select a data dictionary.
- Tap **Create**. The Collect Features screen appears:

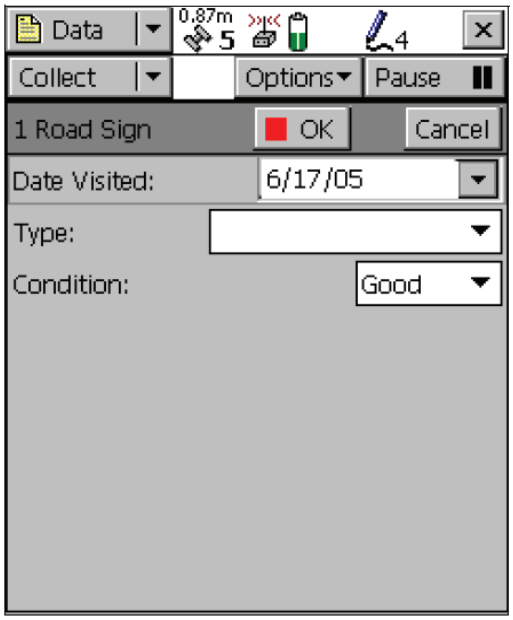


10. Collecting a Point Feature: When you record a point feature, you remain stationary for some time. The TerraSync software logs a number of GPS positions during this time. These positions are averaged together to compute the final GPS position of the point feature.

    When the TerraSync software is logging GPS positions, the logging icon appears in the status bar. The number beside the icon indicates how many positions have been logged for the selected feature. It is recommended that a minimum of 20 positions are logged prior to recording the feature.

    To record a Point Feature:

    - Make sure the Collect Features screen is open.
    - In the Choose Feature list, highlight an appropriate point feature and then tap **Create**. The attribute entry form for the feature type appears:
    - Fill in the attribute field with appropriate values



- Once you have reached the desired amount of positions, tap OK to close the road sign feature. The attribute entry form closes and you are returned to the Collect Features screen.
- Refer to the TerraSync Orientation Guide for steps on how to collect other features.

11. Ending the data collection session: When the data collection session is complete, close the data file and then exit the Terra Sync software.

- In the Collect Features screen, tap **Close**.
- A message appears asking you to confirm that you want to close the open file. Tap **Yes** to close.
- Tap the X button in the top right corner of the screen.
- A message appears asking you to confirm that you want to close the TerraSync software. Tap **Yes** to close.

C. Preventive Maintenance

Data should be downloaded from the datalogger a minimum of once daily, twice daily is preferred. At the end of each day the receiver batteries should be recharged. For technical assistance call the rental company through which you acquired the Trimble® unit. Guidance is also provided in the manual and at http://www.trimble.com.

V. References

GeoExplorer® 6000 series, Trimble, February 2011.

TerraSync and GPS Pathfinder Office Software Guide, December 2006

Equipment Blank and Field Blank Preparation

I. Purpose

To prepare blanks to determine whether decontamination procedures are adequate and whether any cross-contamination is occurring during sampling due to contaminated air and dust.

II. Scope

The general protocols for preparing the blanks are outlined. The actual equipment to be rinsed will depend on the requirements of the specific sampling procedure.

III. Equipment and Materials

- Blank liquid (use ASTM Type II or lab grade deionized water)
- Sample bottles as appropriate
- Gloves
- Preservatives as appropriate

IV. Procedures and Guidelines

A. Decontaminate all sampling equipment that has come in contact with sample according to Standard Operating Procedure 003, *Decontamination of Personnel and Equipment.*

B. To collect an equipment blank for volatile analysis from the surfaces of sampling equipment other than pumps, pour blank water over one piece of equipment and into two or three (laboratory dependent) 40-millilter vials until there is a positive meniscus, then seal the vials. Note the sample number and associated piece of equipment in the field notes as well as the type and lot number of the water used.

For non-volatiles analyses, one aliquot is to be used for equipment. For example, if a pan and trowel are used, place trowel in pan and pour blank fluid in pan such that pan and trowel surfaces which contacted the sample are contacted by the blank fluid. Pour blank fluid from pan into appropriate sample bottles.

Do not let the blank fluid come in contact with any equipment that has not been decontaminated.

C. When collecting an equipment blank from a pump, run an extra gallon of deionized water through the pump while collecting the pump outflow into appropriate containers. Make sure the flow rate is low when sampling volatile organic compounds. If a submersible pump with disposable tubing is used, remove the disposable tubing after sampling but before decontamination. When decontamination is complete, put a 3- to 5-foot segment of new tubing onto the pump to collect the equipment blank.

D. To collect a field blank, slowly pour ASTM Type II or laboratory grade deionized water directly into sample containers.

E. Document and ship samples in accordance with the procedures for other samples.

F. Collect next field sample.

V. Attachments

None.

VI. Key Checks and Items

- Wear gloves.
- Do not use any non-decontaminated equipment to prepare blank.
- Use ASTM-Type II or labortatory grade deionized water.

Chain-of-Custody

I. Purpose

The purpose of this SOP is to provide information on chain-of-custody procedures to be used under the CLEAN Program.

II. Scope

This procedure describes the steps necessary for transferring samples using Chain-of-Custody Records. A Chain-of-Custody Record is required, without exception, for the tracking and recording of samples collected for on-site or off-site analysis (chemical or geotechnical) during program activities (except wellhead samples taken for measurement of field parameters). Use of the Chain-of-Custody Record Form creates an accurate written record that can be used to trace the possession and handling of the sample from the moment of its collection through analysis. This procedure identifies the necessary custody records and describes their completion. This procedure does not take precedence over region specific or site-specific requirements for chain-of-custody.

III. Definitions

Chain-of-Custody Record Form - A Chain-of-Custody Record Form is a printed two-part form that accompanies a sample or group of samples as custody of the sample(s) is transferred from one custodian to another custodian. One copy of the form must be retained in the project file.

Custodian - The person responsible for the custody of samples at a particular time, until custody is transferred to another person (and so documented), who then becomes custodian. A sample is under one's custody if:

- It is in one's actual possession.
- It is in one's view, after being in one's physical possession.
- It was in one's physical possession and then they locked it up to prevent tampering.
- It is in a designated and identified secure area.

Sample - A sample is physical evidence collected from a facility or the environment, which is representative of conditions at the point and time that it was collected.

IV. Procedures

The term "chain-of-custody" refers to procedures which ensure that evidence presented in a court of law is valid. The chain-of-custody procedures track the evidence from the time and place it is first obtained to the courtroom, as well as providing security for the evidence as it is moved and/or passed from the custody of one individual to another.

Chain-of-custody procedures, recordkeeping, and documentation are an important part of the management control of samples. Regulatory agencies must be able to provide the chain-of-possession and custody of any samples that are offered for evidence, or that form the basis of analytical test results introduced as evidence. Written procedures must be available and followed whenever evidence samples are collected, transferred, stored, analyzed, or destroyed.

A. Sample Identification

The method of identification of a sample depends on the type of measurement or analysis performed. When in situ measurements are made, the data are recorded directly in bound logbooks or other field data records with identifying information.

Information which shall be recorded in the field logbook, when in-situ measurements or samples for laboratory analysis are collected, includes:

- Field Sampler(s),
- Contract Task Order (CTO) Number,
- Project Sample Number,
- Sample location or sampling station number,
- Date and time of sample collection and/or measurement,
- Field observations,
- Equipment used to collect samples and measurements, and
- Calibration data for equipment used

Measurements and observations shall be recorded using waterproof ink.

B. Sample Label

Samples, other than for in situ measurements, are removed and transported from the sample location to a laboratory or other location for analysis. Before removal, however, a sample is often divided into portions, depending upon the analyses to be performed. Each portion is preserved in accordance with the Sampling and Analysis Plan. Each sample container is identified by a sample label (**Attachment 1**). Sample labels are provided, along with sample containers, by the analytical laboratory. The information recorded on the sample label includes:

- **Project:** Name of project site.
- **Sample Identification:** The unique sample number identifying this sample.
- **Date:** A six-digit number indicating the day, month, and year of sample collection (for example, 05/21/17).
- **Time:** A four-digit number indicating the 24-hour time of collection (for example: 0954 is 9:54 a.m., and 1629 is 4:29 p.m.).
- **Medium:** Water, soil, sediment, sludge, waste, etc.
- **Sample Type:** Grab or composite.
- **Preservation:** Type and quantity of preservation added.

- **Analysis:** VOA, BNAs, PCBs, pesticides, metals, cyanide, other.
- **Sampled By:** Printed name or initials of the sampler.
- **Remarks:** Any pertinent additional information.

The field team should always follow the sample ID system prepared by the Project Chemist and reviewed by the Project Manager.

C. Chain-of-Custody Procedures

After collection, separation, identification, and preservation, the sample is maintained under chain-of-custody procedures until it is in the custody of the analytical laboratory and has been stored or disposed.

D. Field Custody Procedures

- Samples are collected as described in the site Sampling and Analysis Plan. Care must be taken to precisely record the sample location and to ensure that the sample number on the label matches the Chain-of-Custody Record exactly.
- A Chain-of-Custody Record will be prepared for each individual cooler shipped and will include only the samples contained within that cooler. The Chain-of-Custody Record for that cooler will then be sealed in a zip-log bag and placed in the cooler prior to sealing. This ensures that the laboratory properly attributes trip blanks with the correct cooler and allows for easier tracking should a cooler become lost during transit.
- The person undertaking the actual sampling in the field is responsible for the care and custody of the samples collected until they are properly transferred or dispatched.
- When photographs are taken of the sampling as part of the documentation procedure, the name of the photographer, date, time, site location, and site description are entered sequentially in the site logbook as photos are taken. Once downloaded to the server or developed, the electronic files or photographic prints shall be serially numbered, corresponding to the logbook descriptions; photographic prints will be stored in the project files. To identify sample locations in photographs, an easily read sign with the appropriate sample location number should be included.
- Sample labels shall be completed for each sample, using waterproof ink unless prohibited by weather conditions (e.g., a logbook notation would explain that a pencil was used to fill out the sample label if the pen would not function in freezing weather.)

E. Transfer of Custody and Shipment

Samples are accompanied by a Chain-of-Custody Record Form. A Chain-of-Custody Record Form must be completed for each cooler and should include only the samples contained within that cooler. A Chain-of-Custody Record Form example is shown in **Attachment 2**. When transferring the possession of samples, the individuals relinquishing and receiving will sign, date, and note the time on the Record. This Record documents sample custody transfer from the sampler,

often through another person, to the analyst in the laboratory. The Chain-of-Custody Record is filled out as given below:

- Enter header information (CTO number, samplers, and project name).
- Enter sample specific information (sample number, media, sample analysis required and analytical method grab or composite, number and type of sample containers, and date/time sample was collected).
- Sign, date, and enter the time under "Relinquished by" entry.
- Have the person receiving the sample sign the "Received by" entry. If shipping samples by a common carrier, print the carrier to be used and enter the airbill number under "Remarks," in the bottom right corner.
- Place the original (top, signed copy) of the Chain-of-Custody Record Form in a plastic zipper-type bag or other appropriate sample-shipping package. Retain the copy with field records.
- Sign and date the custody seal, a 1-inch by 3-inch white paper label with black lettering and an adhesive backing. **Attachment 3** is an example of a custody seal. The custody seal is part of the chain-of-custody process and is used to prevent tampering with samples after they have been collected in the field. Custody seals shall be provided by the analytical laboratory.
- Place the seal across the shipping container opening (front and back) so that it would be broken if the container were to be opened.
- Complete other carrier-required shipping papers.

The custody record is completed using waterproof ink. Any corrections are made by drawing a line through and initialing and dating the change, then entering the correct information. Erasures are not permitted.

Common carriers will usually not accept responsibility for handling Chain-of-Custody Record Forms; this necessitates packing the record in the shipping container (enclosed with other documentation in a plastic zipper-type bag). If custody forms are sealed inside the shipping container and the custody seals are intact, commercial carriers are not required to sign the custody form.

The laboratory representative who accepts the incoming sample shipment signs and dates the Chain-of-Custody Record, completing the sample transfer process. It is then the laboratory's responsibility to maintain internal logbooks and custody records throughout sample preparation and analysis.

V. Quality Assurance Records

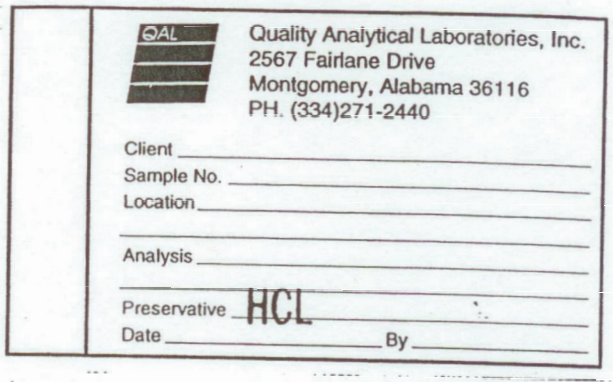
Once samples have been packaged and shipped, the Chain-of-Custody copy and airbill receipt become part of the quality assurance record.

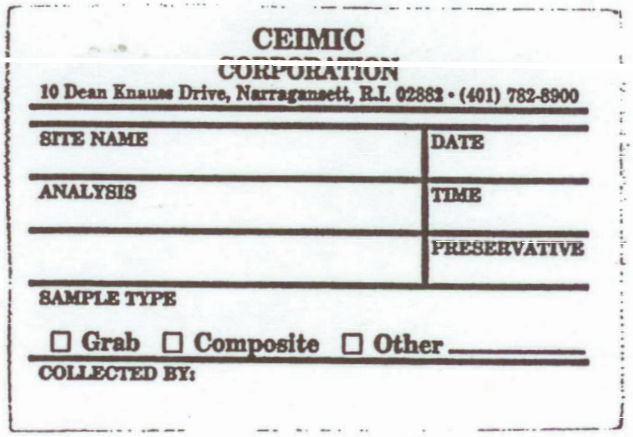
VI. Attachments

1. Sample Label
2. Chain of Custody Form
3. Custody Seal

VII. References

USEPA. User's Guide to the Contract Laboratory Program. Office of Emergency and Remedial Response, Washington, D.C. (EPA/540/P-91/002), January 1991.


QAL
Quality Analytical Laboratories, Inc.
2567 Fairlane Drive
Montgomery, Alabama 36116
PH. (334)271-2440
Client
Sample No.
Location
Analysis
Preservative HCL
Date
By


CEIMIC
CORPORATION
10 Dean Knauss Drive, Narragansett, R.I. 02882 • (401) 782-8900
SITE NAME
DATE
ANALYSIS
TIME
PRESERVATIVE
SAMPLE TYPE
☐ Grab ☐ Composite ☐ Other
COLLECTED BY:

CH2M HILL
APPLIED SCIENCES LABORATORY

CHAIN OF CUSTODY RECORD AND AGREEMENT TO PERFORM SERVICES

CH2M Hill Project # ☐☐☐☐☐☐☐☐.☐☐.☐☐ | Purchase Order #

Project Name

Company Name CH2M HILL Office

Project Manager & Phone # | Report Copy to:
Mr. [ ]
Ms. [ ]
Dr. [ ]

Requested Completion Date: | Sampling Requirements: SDWA ☐ NPDES ☐ RCRA ☐ OTHER ____ | Sample Disposal: Dispose ☐ Return ☐

Sampling Date	Sampling Time	Type COMP	Type GRAB	Matrix WATER	Matrix SOIL	Matrix AIR	CLIENT SAMPLE ID (9 CHARACTERS)	# OF CONTAINERS	LAB TEST CODES	ANALYSES REQUESTED	REMARKS	LAB 1 ID	LAB 2 ID

SHADED AREA– FOR LAB USE ONLY

Lab 1 # | Lab 2 #

Quote # | Kit Request #

Project #

No. of Samples | Page ___ of ___

Login | LIMS Ver

Sampled By & Title (Please sign and print name) | Date/Time | Relinquished By (Please sign and print name) | Date/Time | QC Level: 1 2 3 Other: ____

Received By (Please sign and print name) | Date/Time | Relinquished By (Please sign and print name) | Date/Time | COC Rec | ICE

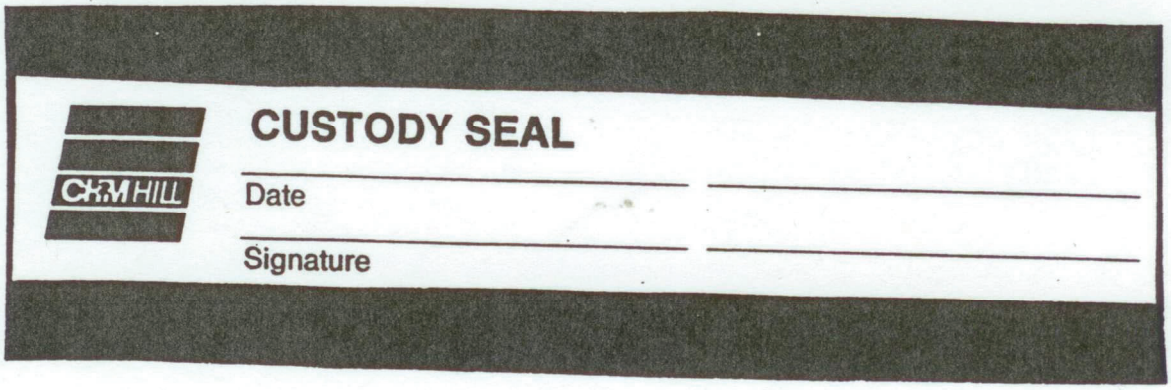
Received By (Please sign and print name) | Date/Time | Relinquished By (Please sign and print name) | Date/Time | Ana Req | TEMP

Received By (Please sign and print name) | Date/Time | Shipped Via UPS BUS Fed-Ex Hand Other ____ | Shipping # | Cust Seal | Ph

Work Authorized By (Please sign and print name) | Remarks

Instructions and Agreement Provisions on Reverse Side

DISTRIBUTION: Original - LAB, Yellow - LAB, Pink - Client
REV 3/94 FORM 340


CH2M HILL
CUSTODY SEAL
Date
Signature

Packaging and Shipping Procedures for Low-Concentration Samples

I. Purpose and Scope

The purpose of this guideline is to describe the packaging and shipping of low-concentration samples of various media to a laboratory for analysis.

II. Scope

The guideline only discusses the packaging and shipping of samples that are anticipated to have low concentrations of chemical constituents. Whether or not samples should be classified as low-concentration or otherwise will depend upon the site history, observation of the samples in the field, odor, and photoionization-detector readings.

If the site is known to have produced high-concentration samples in the past or the sampler suspects that high concentrations of contaminants might be present in the samples, then the sampler should conservatively assume that the samples cannot be classified as low-concentration. Samples that are anticipated to have medium to high concentrations of constituents should be packaged and shipped accordingly.

If warranted, procedures for dangerous-goods shipping may be implemented. Dangerous goods and hazardous materials pose an unreasonable risk to health, safety, or property during transportation without special handling. As a result only employees who are trained under Jacobs Dangerous Goods Shipping course may ship or transport dangerous goods. Employees should contact a designated Jacobs HazMat advisor with questions.

A. Equipment and Materials

- Coolers
- Clear tape
- Strapping tape
- Contractor bags
- Absorbent pads or equivalent
- Resealable bags
- Bubble bags (for glass bottle ware)
- Bubble wrap (if needed)
- Ice
- Chain-of-Custody form (completed)
- Custody seals

B. Procedures and Guidelines

1. Low-Concentration Samples

   A. Prepare coolers for shipment:

      - Tape drains shut.
      - Place mailing label with laboratory address on top of coolers.
      - Fill bottom of coolers with absorbent pads or similar material.
      - Place a contractor bag inside the cooler.

   B. Affix appropriate adhesive sample labels to each container. Protect with clear packing tape.

   C. Arrange decontaminated sample containers in groups by sample number. Consolidate VOC samples into one cooler to minimize the need for trip blanks. Cross check CoC to ensure all samples are present.

   D. Seal each glass sample bottle within a separate bubble bag (VOCs grouped per sample location). Sample labels should be visible through the bag. Whenever possible, group samples per location for all analytes and place in resealable bags. Make sure to release as much air as practicable from the bag before sealing.

   E. Arrange sample bottles in coolers so that they do not touch.

   F. If ice is required to preserve the samples, cubes should be repackaged in resealable bags and placed on and around the containers.

   G. Fill remaining spaces with bubble wrap if needed.

   H. Complete and sign chain-of-custody form (or obtain signature) and indicate the time and date it was relinquished to Federal Express or the courier.

   I. Close lid and latch.

   J. Carefully peel custody seals from backings and place intact over lid openings (right front and left back). Cover seals with clear packing tape.

   K. Tape cooler shut on both ends, making several complete revolutions with strapping tape. Cover custody seals with clear packing tape to avoid seals being able to be peeled from the cooler.

   L. Relinquish to Federal Express or to a courier arranged with the laboratory. Scan air bill receipt and CoC and send to the sample documentation coordinator along with the other documentation.

C. Medium- and High-Concentration Samples:

Medium- and high-concentration samples are packaged using the same techniques used to package low-concentration samples, with potential additional restrictions. If applicable, the sample handler must refer to instructions associated with the shipping of dangerous goods for the necessary procedures for shipping by Federal Express (preferred) or other overnight carrier (if necessary). If warranted, procedures for

dangerous-goods shipping may be implemented. Dangerous goods and hazardous materials pose an unreasonable risk to health, safety, or property during transportation without special handling. As a result, only employees who are trained under Jacobs Dangerous Goods Shipping course may ship or transport dangerous goods. Employees should contact a designated Jacobs HazMat advisor with questions.

III. Attachments

None.

IV. Key Checks and Items

- Be sure laboratory address is correct on the mailing label
- Pack sample bottles carefully, with adequate packaging and without allowing bottles to touch
- Be sure there is adequate ice
- Include chain-of-custody form
- Include custody seals

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Logging of Soil Borings

I. Purpose and Scope

This SOP provides guidance to obtain accurate and consistent descriptions of soil characteristics during soil-sampling operations. The characterization is based on visual examination and manual tests, not on laboratory determinations.

II. Equipment and Materials

- Indelible pens
- Tape measure or ruler
- Field logbook
- Spatula
- HCL, 10 percent solution
- Squirt bottle with water
- Rock- or soil-color chart (e.g., Munsell)
- Grain-size chart
- Hand lens
- Unified Soil Classification System (USCS) index charts and tables to help with soil classification (attached)

III. Procedures and Guidelines

This section covers several aspects of soil characterization: instructions for completing the soil boring log form (attached), field classification of soil, and standard penetration test procedures.

A. Instructions for Completing Soil Boring Logs

Soil boring logs will be completed in the field log books or on separate soil boring log sheets. Information collected will be consistent with that required for ASTM D1586, a standard soil boring log form (attached), or an equivalent form that supplies the same information.

The information collected in the field to perform the soil characterization is described below.

Field personnel should review completed logs for accuracy, clarity, and thoroughness of detail. Samples also should be checked to see that information is correctly recorded on both sample jar labels and on the log sheets.

B. Heading Information

1. **Boring/Well Number.** Enter the boring/well number. A numbering system should be chosen that does not conflict with information recorded for previous exploratory work done at the site. Number the sheets consecutively for each boring.
2. **Location.** If station, coordinates, mileposts, or similar project layout information is available, indicate the position of the boring to that system using modifiers such as “approximate” or “estimated” as appropriate.
3. **Elevation.** Elevation will be determined at the conclusion of field activities through a survey.
4. **Drilling Contractor.** Enter the name of the drilling company and the city and state where the company is based.
5. **Drilling Method and Equipment.** Identify the bit size and type, drilling fluid (if used), and method of drilling (e.g., rotary, hollow-stem auger, sonic). Information on the drilling equipment (e.g., CME 55, Mobile B61) also is noted.
6. **Water Level and Date.** Enter the depth below ground surface to the apparent water level in the borehole. The information should be recorded as a comment. If free water is not encountered during drilling or cannot be detected because of the drilling method, this information should be noted. Record date and time of day (for tides, river stage) of each water level measurement.
7. **Date of Start and Finish.** Enter the dates the boring was begun and completed. Time of day should be added if several borings are performed on the same day.
8. **Logger.** Enter the first and last name.

C. Technical Data

1. **Depth Below Surface**. Use a depth scale that is appropriate for the sample spacing and for the complexity of subsurface conditions.
2. **Sample Interval.** Note the depth at the top and bottom of the sample interval.
3. **Sample Type and Number.** Enter the sample type and number. SS-1 = split spoon, first sample. Number samples consecutively regardless of type. Enter a sample number even if no material was recovered in the sampler.
4. **Sample Recovery.** Enter the length to the nearest 0.1-foot of soil sample recovered from the sampler. Often, there will be some wash or caved material above the sample; do not include the wash material in the measurement. Record soil recovery in feet.
5. **Standard Penetration Test Results.** In this column, enter the number of blows required for each 6 inches of sampler penetration and the "N" value, which is the sum of the blows in the middle two 6-inch penetration intervals. A typical standard penetration test involving successive blow counts of 2, 3, 4, and 5 is recorded as 2-3-4-5 and (7). The standard penetration test is terminated if the sampler encounters refusal. Refusal is a penetration of less than 6 inches with a blow count of 50. A partial penetration of 50 blows for 4 inches is

recorded as 50/4 inches. Penetration by the weight of the slide hammer only is recorded as "WOH."

6. Samples should be collected using a 140-pound hammer and 2-inch diameter split spoons. Samples may be collected using direct push sampling equipment. However, blow counts will not be available. A pocket penetrometer may be used instead to determine relative soil consistency of fine grained materials (silts and clays).
7. Sample also may be collected using a 300-pound hammer or 3-inch-diameter split-spoon samples at the site. However, use of either of these sample collection devices invalidates standard penetration test results and should be noted in the comments section of the log. The 300-pound hammer should only be used for collection of 3-inch-diameter split-spoon samples. Blow counts should be recorded for collection of samples using either a 3-inch split-spoon, or a 300-pound hammer. An "N" value need not be calculated.
8. **Soil Description.** The soil classification should follow the format described in the "Field Classification of Soil" subsection below.
9. **Comments.** Include all pertinent observations (changes in drilling fluid color, rod drops, drilling chatter, rod bounce as in driving on a cobble, damaged Shelby tubes, and equipment malfunctions). In addition, note if casing was used, the sizes and depths installed, and if drilling fluid was added or changed. You should instruct the driller to alert you to any significant changes in drilling (changes in material, occurrence of boulders, and loss of drilling fluid). Such information should be attributed to the driller and recorded in this column.
10. Specific information might include the following:
    - The date and the time drilling began and ended each day
    - The depth and size of casing and the method of installation
    - The date, time, and depth of water level measurements
    - Depth of rod chatter
    - Depth and percentage of drilling fluid loss
    - Depth of hole caving or heaving
    - Depth of change in material
    - Health and safety monitoring data
    - Drilling interval through a boulder

D. Field Classification of Soil

This section presents the format for the field classification of soil. In general, the approach and format for classifying soils should conform to ASTM D 2488, Visual-Manual Procedure for Description and Identification of Soils.

The Unified Soil Classification System is based on numerical values of certain soil properties that are measured by laboratory tests. It is possible, however, to estimate these values in the field with reasonable accuracy using visual-manual procedures (ASTM D 2488). In addition, some elements of a complete soil description, such as the presence of cobbles or boulders, changes in strata, and the relative proportions of soil types in a bedded deposit, can be obtained only in the field.

Soil descriptions should be precise and comprehensive without being verbose. The correct overall impression of the soil should not be distorted by excessive emphasis on insignificant details. In general, similarities rather than differences between consecutive samples should be stressed.

Soil descriptions must be recorded for every soil sample collected. The format and order for soil descriptions should be as follows:

- Soil name (synonymous with ASTM D 2488 Group Name) with appropriate modifiers. Soil name should be in all capitals in the log, for example “POORLY-GRADED SAND.”
- Group symbol, in parentheses, for example, “(SP).”
- Color, using Munsell color designation
- Moisture content
- Relative density (coarse grained) or consistency (fine grained)
- Soil structure, mineralogy, or other descriptors

This order follows, in general, the format described in ASTM D 2488.

E. Soil Name

The basic name of a soil should be the ASTM D 2488 Group Name on the basis of visual estimates of gradation and plasticity. The soil name should be capitalized.

Examples of acceptable soil names are illustrated by the following descriptions:

- A soil sample is visually estimated to contain 15 percent gravel, 55 percent sand, and 30 percent fines (passing No. 200 sieve). The fines are estimated as either low or highly plastic silt. This visual classification is SILTY SAND WITH GRAVEL, with a Group Symbol of (SM).
- Another soil sample has the following visual estimate: 10 percent gravel, 30 percent sand, and 60 percent fines (passing the No. 200 sieve). The fines are estimated as low plastic silt. This visual classification is SANDY SILT. The gravel portion is not included in the soil name because the gravel portion was estimated as less than 15 percent. The Group Symbol is (ML).

The gradation of coarse-grained soil (more than 50 percent retained on No. 200 sieve) is included in the specific soil name in accordance with ASTM D 2488. There is no need to further document the gradation. However, the maximum size and angularity or roundness of gravel and sand-sized particles should be recorded. For fine-grained soil (50 percent or more passing the No. 200 sieve), the name is modified by the appropriate plasticity/elasticity term in accordance with ASTM D 2488.

Interlayered soil should each be described starting with the predominant type. An introductory name, such as “Interlayered Sand and Silt,” should be used. In addition, the relative proportion of each soil type should be indicated (see Table 1 for example).

Where helpful, the evaluation of plasticity/elasticity can be justified by describing results from any of the visual-manual procedures for identifying fine-grained soils, such as reaction to shaking, toughness of a soil thread, or dry strength as described in ASTM D 2488.

F. Group Symbol

The appropriate group symbol from ASTM D 2488 must be given after each soil name. The group symbol should be placed in parentheses to indicate that the classification has been estimated.

In accordance with ASTM D 2488, dual symbols (e.g., GP-GM or SW-SC) can be used to indicate that a soil is estimated to have about 10 percent fines. Borderline symbols (e.g., GM/SM or SW/SP) can be used to indicate that a soil sample has been identified as having properties that do not distinctly place the soil into a specific group. Generally, the group name assigned to a soil with a borderline symbol should be the group name for the first symbol. The use of a borderline symbol should not be used indiscriminately. Every effort should be made to first place the soil into a single group.

G. Color

The color of a soil must be given. The color description should be based on the Munsell system. The color name and the hue, value, and chroma should be given.

H. Moisture Content

The degree of moisture present in a soil sample should be defined as dry, moist, or wet. Moisture content can be estimated from the criteria listed on **Table 2**.

I. Relative Density or Consistency

Relative density of a coarse-grained (cohesionless) soil is based on N-values (ASTM D 1586). If the presence of large gravel, disturbance of the sample, or non-standard sample collection makes determination of the in situ relative density or consistency difficult, then this item should be left out of the description and explained in the Comments column of the soil boring log.

Consistency of fine-grained (cohesive) soil is properly based on results of pocket penetrometer or torvane results. In the absence of this information, consistency can be estimated from N-values. Relationships for determining relative density or consistency of soil samples are given in **Tables 3 and 4**.

J. Soil Structure, Mineralogy, and Other Descriptors

Discontinuities and inclusions are important and should be described. Such features include joints or fissures, slickensides, bedding or laminations, veins, root holes, and wood debris.

Significant mineralogical information such as cementation, abundant mica, or unusual mineralogy should be described.

Other descriptors may include particle size range or percentages, particle angularity or shape, maximum particle size, hardness of large particles, plasticity of fines, dry strength, dilatancy, toughness, reaction to HCl, and staining, as well as other information such as organic debris, odor, or presence of free product.

K. Equipment and Calibration

Before starting the testing, the equipment should be inspected for compliance with the requirements of ASTM D 1586. The split-barrel sampler should measure 2-inch or 3-inch OD, and should have a split tube at least 18 inches long. The minimum size sampler rod allowed is “A” rod (1-5/8-inch OD). A stiffer rod, such as an “N” rod (2-5/8-inch OD), is required for depths greater than 50 feet. The drive weight assembly should consist of a 140-pound or 300-pound hammer weight, a drive head, and a hammer guide that permits a free fall of 30 inches.

IV. Attachments

- Soil Boring Log (Sample Soil Boring Log.xls)
- Soil Boring Log Site 56 Example (Soil Boring Log_Site 56_Example)
- Soil Boring Log Form with a completed example (Soil_Log_Examp.pdf)
- Tables 1 through 4 (Tables 1-4.pdf)

V. Key Checks and Preventive Maintenance

- Check entries to the soil-boring log and field logbook in the field; because the samples will be disposed of at the end of fieldwork, confirmation and corrections cannot be made later.
- Check that sample numbers and intervals are properly specified.
- Check that drilling and sampling equipment is decontaminated using the procedures defined in SOP *Decontamination of Drilling Rigs and Equipment*.

VI. References

ASTM D2488-17e1, Standard Practice for Description and Identification of Soils (Visual-Manual Procedures), ASTM International, West Conshohocken, PA, 2017, www.astm.org

ASTM D1586 / D1586M-18, Standard Test Method for Standard Penetration Test (SPT) and Split-Barrel Sampling of Soils, ASTM International, West Conshohocken, PA, 2018, www.astm.org

SOIL BORING LOG	PROJECT NUMBER	BORING NUMBER

PROJECT : LOCATION :

ELEVATION : DRILLING CONTRACTOR :

DRILLING METHOD AND EQUIPMENT USED :

ATD WATER LEVEL : START : END : LOGGER :

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	SAMPLE #/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N')	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	USCS	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. DRILLING ACTIONS/DRILLER COMMENTS PID Readings: Breathing Zone: Above Hole:

SOIL BORING LOG	PROJECT NUMBER 663482CH	BORING NUMBER PX-S56-SO32

PROJECT: Patuxent NAS Site 6 Remedial Investigation — LOCATION : PX-S56-SO32

ELEVATION : TBD — DRILLING CONTRACTOR: A-Zone

DRILLING METHOD AND EQUIPMENT USED : 3.4" outer diameter, using DPT GeoProbe 7822DT

ATD WATER LEVEL : 20 ft bgs — START : 3/4/2020 — END : 3/4/2020 — LOGGER : E. Anzinger

DEPTH BELOW SURFACE (FT)	INTERVAL (FT)	RECOVERY (FT)	SAMPLE #/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N')	SOIL DESCRIPTION (SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.)	USCS	COMMENTS (DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. DRILLING ACTIONS/DRILLER COMMENTS) PID Readings: Breathing Zone: Above Hole:
0.0 - 0.5	5	4	Surface Interval (0 - 1')	NA	Dark brown sandy clayey silt **MC**, 10YR 4/4, dry, loose	MC	0.0 ppm
0.5 - 1.25					Brown clayey fine to coarse sand, well graded **SW**, 10YR 4/4, moist , loose with some sub round to subangular gravel and silt; some vegetation and twigs	SW	0.0 ppm
1.25 - 3.5					Tan/orange clayey fine to coarse sand, well graded **SW** 10YR 4/6, with trace subangular gravel and large cobble (35mm+), moist, medium dense	SW	0.0 ppm
3.5 - 6.0					Light brown/tan fine to coarse sand, well graded **SW** 10YR 6/6 with subround to subangular gravels, moist, medium dense	SW	0.0 ppm
6.0 - 10.0	10	3.5	NA	NA	Light brown/gray fine to coarse sand, well graded **SW** 2.5YR 6/2 with some subround to subangular gravels, some large cobbles (35mm+) moist, medium dense	SW	0.0 ppm
10.0 - 13.0	15	5	Midpoint (15 - 16')	NA	Light brown/gray fine to coarse sand, poorly graded **SP** 2.5YR 6/2 with some subround to subangular gravels, some large cobbles (35mm+) moist, medium dense	SP	0.0 ppm
13 - 14.5					Dark brown medium sand, poorly graded **SP** 10YR 4/4 with trace large subround cobbles moist, medium dense	SP	0.0 ppm
14.5 - 16.0					Tan/orange fine to coarse sand, well graded **SW** 10YR 6/6, with trace subround to subangular gravel and large cobbles (35mm+), moist, medium dense	SW	0.0 ppm
16.0 - 21.5	20	4	Above Water (19 - 20')	NA	Tan/orange very fine to fine sand poorly graded, 10YR 6/6, with trace small subround to subangular gravels throughout, moist to saturated (saturated from 20' - 21.5' bgs), dense	SP	Water at 20 feet bgs, well screen set from 20 - 30 feet bgs. 0.0 ppm.
21.5 - 24.0	25	5	NA	NA	Light gray/orange/tan very fine to fine sand poorly graded **SP** 2.5YR 6/2, with trace subround gravel, saturated at top of interval (moist to wet), dense	SP	0.0 ppm
24.0 - 26.0					Light brown/gray fine sand, poorly graded **SP** 2.5YR 6/2, moist to wet, dense	SP	0.0 ppm
26.0 - 28.0	30	5	NA	NA	Tan/orange/brown fine sand, poorly graded **SP** 10YR 5/6 trace subangular gravel and cobbles, moist to wet, dense	SP	0.0 ppm
28.0 - 30.0					Orange/tan fine to medium sand, well graded **SW** 10YR 5/6 moist, medium dense	SW	0.0 ppm

Table 1
EXAMPLE SOIL DESCRIPTIONS

POORLY GRADED SAND (SP), light brown, moist, loose, fine sand size

FAT CLAY (CH), dark gray, moist, stiff

SILT (ML), light greenish gray, wet, very loose, some mica, lacustrine

WELL-GRADED SAND WITH GRAVEL (SM), reddish brown, moist, dense, subangular gravel to 0.6 inches max

POORLY GRADED SAND WITH SILT (SP-SM), white, wet, medium dense

ORGANIC SOIL WITH SAND (OH), dark brown to black, wet, firm to stiff but spongy undisturbed, becomes soft and sticky when remolded, many fine roots, trace of mica

SILTY GRAVEL WITH SAND (GM), brownish red, moist, very dense, subrounded gravel to 1.2 inches max

INTERLAYERED SILT (60 percent) AND CLAY (40 percent): SILT WITH SAND (ML), medium greenish gray, nonplastic, sudden reaction to shaking, layers mostly 1.5 to 8.3 inches thick; LEAN CLAY (CL), dark gray, firm and brittle undisturbed, becomes very soft and sticky when remolded, layers 0.2 to 1.2 inches thick

SILTY SAND WITH GRAVEL (SM), light yellowish brown, moist, medium dense, weak gravel to 1.0 inches max, very few small particles of coal, fill

SANDY ELASTIC SILT (MH), very light gray to white, wet, stiff, weak calcareous cementation

LEAN CLAY WITH SAND (CL/MH), dark brownish gray, moist, stiff

WELL-GRADED GRAVEL WITH SILT (GW-GM), brown, moist, very dense, rounded gravel to 1.0 inches max

Table 2
CRITERIA FOR DESCRIBING MOISTURE CONDITION

Description	Criteria
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp, but no visible water
Wet	Visible free water, usually soil is below water table

Table 3
RELATIVE DENSITY OF COARSE-GRAINED SOIL
(Developed from Sowers, 1979)

Blows/Ft	Relative Density	Field Test
0-4	Very loose	Easily penetrated with ½-in. steel rod pushed by hand
5-10	Loose	Easily penetrated with ½-in. steel rod pushed by hand
11-30	Medium	Easily penetrated with ½-in. steel rod driven with 5-lb hammer
31-50	Dense	Penetrated a foot with ½-in. steel rod driven with 5-lb hammer
>50	Very dense	Penetrated only a few inches with ½-in. steel rod driven with 5-lb hammer

Table 4
CONSISTENCY OF FINE-GRAINED SOIL
(Developed from Sowers, 1979)

Blows/Ft	Consistency	Pocket Penetrometer (TSF)	Torvane (TSF)	Field Test
<2	Very soft	<0.25	<0.12	Easily penetrated several inches by fist
2-4	Soft	0.25-0.50	0.12-0.25	Easily penetrated several inches by thumb
5-8	Firm	0.50-1.0	0.25-0.5	Can be penetrated several inches by thumb with moderate effort
9-15	Stiff	1.0-2.0	0.5-1.0	Readily indented by thumb, but penetrated only with great effort
16-30	Very stiff	2.0-4.0	1.0-2.0	Readily indented by thumbnail
>30	Hard	>4.0	>2.0	Indented with difficulty by thumbnail

Shallow Soil Sampling

I. Purpose

To provide general guidelines for the collection and handling of surface soil samples during field operations.

II. Scope

The method described for surface soil sampling is applicable for loosely packed earth and is used to collect disturbed-soil samples.

III. Equipment and Materials

- Sample jars.
- A hand auger or other device that can be used to remove the soil from the ground. Stainless-steel is preferred. However, split spoons, which are most commonly available in carbon steel are acceptable for use only if they are not rusty.
- A stainless-steel spatula or disposable plastic scoop should be used to remove material from the sampling device.
- Unpainted wooden stakes or pin flags
- Fiberglass measuring tape (at least 200 feet in length)
- GPS Unit (if available)

IV. Procedures and Guidelines

Wear protective gear, as specified in the Health and Safety Plan.

To locate samples, identify the correct location using the pin flags or stakes. Proceed to collect a sample from the undisturbed soil adjacent to the marker following steps C and D. If markers are not present, the following procedures will be used.

For samples on a grid:

- Use measuring tape to locate each sampling point on the first grid line as prescribed in the sampling plan. As each point is located, drive a numbered stake in the ground and record its location on the site map and in the logbook.
- Proceed to sample the points on the grid line.
- Measure to location where next grid line is to start and stake first sample. For subsequent samples on the line take two orthogonal measurements: one to the previous grid line, and one to the previous sample on the same grid line.

- Proceed to sample the points on the grid line as described in Section C below.
- Repeat 1c and 1d above until all samples are collected from the area.
- Or, a GPS unit can be used to identify each location based on map coordinated, if available.

For non-grid samples:

- Use steel measuring tape to position sampling point at location described in the sampling plan by taking two measurements from fixed landmarks (e.g., corner of house and fence post).
- Note measurements, landmarks, and sampling point on a sketch in the field notebook, and on a site location map.
- Proceed to sample as described in Section C below.
- Repeat 2a through 2c above until all samples are collected from the area.
- Or, a GPS unit can be used to identify each location based on map coordinated, if available.

To the extent possible, differentiate between fill and natural soil. If both are encountered at a boring location, sample both as prescribed in the field sampling plan. Do not locate samples in debris, tree roots, or standing water. In residential areas, do not sample in areas where residents' activities may impact the sample (e.g., barbecue areas, beneath eaves of roofs, driveways, garbage areas). If an obstacle prevents sampling at a measured grid point, move as close as possible, but up to a distance of one half the grid spacing in any direction to locate an appropriate sample. If an appropriate location cannot be found, consult with the Field Team Leader (FTL). If the FTL concurs, the sampling point will be deleted from the program. The FTL will contact the project manager (PM) immediately. The PM and Navy Technical Representative (NTR) will discuss whether the point should be deleted from the program. If it is deleted, the PM will follow-up with the NTR in writing.

To collect samples:

- Use a decontaminated stainless-steel scoop/trowel or disposable plastic scoop to scrape away surficial organic material (grass, leaves, etc.) adjacent to the stake. New disposable scoops or trowels may also be used to reduce the need for equipment blanks.
- If sampling:
  - Surface soil: Obtain soil sample by scooping soil using the augering scoop/trowel, starting from the surface and digging down to a depth of about 6 inches, or the depth specified in the workplan.
  - Subsurface soil: Obtain the subsurface soil sample using an auger down to the depths prescribed in the field sampling plan.
- Take a photo ionization detector (PID) reading of the sampled soil if organics are anticipated to be present and record the response in the field notebook. Also record lithologic description and any pertinent observations (such as discoloration) in the logbook.
- Empty the contents of the scoop/trowel into a decontaminated stainless-steel pan or dedicated sealable bag.
- Repeat this procedure until sufficient soil is collected to meet volume requirements.

- For TCL VOC and field GC aliquots, fill sample jars directly with the trowel or scoop or specialized sampling equipment (i.e. Encore® or Terra Core® sampler) and cap immediately upon filling. DO NOT HOMOGENIZE.
- For TCL pesticides/PCBs and SVOCs, TAL metals, and field XRF aliquots, homogenize cuttings in the pan using a decontaminated stainless-steel utensil in accordance with SOP *Decontamination of Drilling Rigs and Equipment*.
- For TCL PCBs, soil samples should include rocks and hard chunks encountered. The extraction procedure may require that the lab screen the soil to eliminate rocks larger than 3/8 inch in diameter, but the criteria are too complicated to allow a decision to be made in the field.
- Transfer sample for analysis into appropriate containers with a decontaminated utensil.
- Immediately upon collection, all samples for chemical analysis are to be placed in a closed container on ice unless it is not possible to do so. Although unusual and uncommon, there may be instances where it is not possible to have containers with ice at the sample location. In these instances, the samples should be placed on ice as soon as practical and during the time between collection and placing the samples on ice, the samples should be kept as cool as possible
- Backfill the hole with soil removed from the borehole. To the extent possible, replace topsoil and grass and attempt to return appearance of sampling area to its pre-sampled condition. For samples in non-residential, unmowed areas, mark the sample number on the stake and leave stake in place. In mowed areas, remove stake.

V. Attachments

None.

VI. Key Checks and Items

- Use phthalate-free latex or surgical gloves and other personal protective equipment.
- Transfer volatiles first, avoid mixing.
- Decontaminate utensils before reuse, or use dedicated, disposable utensils.

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Locating and Clearing Underground Utilities

I. Purpose

The purpose of this SOP is to provide general guidelines and specific procedures that must be followed on Navy CLEAN projects for locating underground utilities and clearing dig locations in order to maximize our ability to avoid hitting underground utilities and to minimize liabilities to Jacobs and its subcontractors and health and safety risks to our project staff.

This SOP shall be used by Activity Managers and Project Managers to, in-turn, develop Activity-specific and project-specific utility location procedures. The activity and project-specific procedures will become part of work plans and project instructions and will be used to prepare scopes of work (SOWs) for the procurement of utility location subcontractors to meet the needs of individual projects.

This SOP also identifies the types of utility locating services that are available from subcontractors and the various tools that are used to locate utilities, and discusses when each type of service and tool may or may not be applicable.

II. Scope

Depending on the Navy/Marine Activity we typically find ourselves in one of two scenarios:

A. Scenario 1

The Activity provides utility locating (or dig clearance) services through the public works department or similar organization, or has a contract with an outside utility clearance service. Some of these services are provided in the form of dig permits which are required before you can dig or drill. In other cases no official permit is required and the process is somewhat vague.

B. Scenario 2

The Activity does not get involved in any utility locating processes aside from possibly providing the most recent utility maps, and relies on Jacobs to clear the dig locations.

Scenario 1 is preferred because under this scenario the Navy tends to assume the responsibility if the location is improperly cleared, a utility is struck, and property damage results. However, our experience has been that the clearance services provided by the Navy do not meet the standards that we consider to be adequate, in that they often simply rely on available base maps to mark utilities and do not verify locations using field geophysics. And if they do use locating tools, they do not provide adequate documentation or marking to confirm that a location has been cleared. So, while the Navy's process may protect us from liability for property damage, it does not adequately protect our staff and subcontractors from health risks nor does it compensate us for down time, should a utility be hit.

Therefore, regardless of what services the Navy provides, in most cases we still need to supplement this effort with clearance services from our own third-party utility location subcontractor following the procedures and guideline outlined in Section IV of this SOP. The cost implications of providing this service will range from $500 to several $1,000 depending on the size of the project.

The scope of services that we ask our subcontractors to provide can involve utility marking/mapping or the clearing of individual dig locations. In the former we ask our subs to mark all utilities within a "site" and often ask them to prepare a map based on their work. In the later, we ask them to clear (identify if there are any utilities within) a certain radius of a proposed dig/drill location.

The appropriate requested scope of services for a project will depend on the project. Clearing individual boreholes is often less expensive and allows the sub to concentrate their efforts on a limited area. However if the scope of the investigation is fluid (all borehole locations are not predetermined) it may be best to mark and map an entire site or keep the subcontractor on call.

Clearance of individual dig locations should be done to a minimum 20-foot radius around the location.

An example SOW for a utility subcontractor procurement is provided in **Attachment 1**.

III. Services and Equipment

This section provides a general description of the services available to help us locate subsurface utilities and describes the types of equipment that these services may (or may not) use to perform their work. It identifies the capabilities of each type of equipment to help the PM specify what they should require from our utility location subs.

A. Services

The services that are available to us for identifying and marking underground utilities are:

- The local public/private utility-run service such as Miss Utility or 811
- Utility location subcontractors (hired by us)
- Jacobs internal Subsurface Utility Investigation team

Attachment 2 provides a detailed description of each type of organization. It also provides contact numbers and web sites for the various Miss-Utility-type organizations in the areas where we do work for the Navy and contacts and services provided by several subcontractors that we have used or spoken to in the past.

B. Equipment

Attachment 3 provides a summary of the various types of equipment used for subsurface utility location. It describes the capabilities and limitations of each in order to help the PM determine if the equipment being used by a subcontractor is adequate.

It is important to make the potential subcontractors aware of the possible types of utilities (and utility materials) that are at the site, and to have them explain in their bid what types of

equipment they will use to locate utilities /clear dig locations, and what the limitations of these equipment are.

A list of in-house experts that can be used to help you evaluate bids or answer questions you may have is provided in Appendix C.

IV. Procedures and Guidelines

This section presents specific procedures to be followed for the utility location work to be conducted by Jacobs and our subcontractors. In addition, a PM will have to follow the procedures required by the Activity to obtain their approvals, clearances and dig permits where necessary. These "dig permit" requirements vary by Activity and must be added to the project-specific SOP, or project instructions. It is preferable that the Activity perform their clearance processes before we follow up with our clearance work.

A. Activity Notification and Dig Permit Procedures

- Identify Activity-specific permit and/or procedural requirements for excavation and drilling activities. Contact the Base Civil Engineer and obtain the appropriate form to begin the clearance process.
- **Activity Specific:** To be provided by Activity or Project Manager

B. Jacobs Utility Clearance Procedures

Do not begin subsurface construction activities (e.g., trenching, excavation, drilling, etc.) until a check for underground utilities and similar obstructions has been conducted by Jacobs as a follow-up to the services provided by the Navy. The use of as-built drawings and utility company research will be compiled and must be supplemented with a geophysical or other survey by a qualified, independent survey contractor (subcontracted to Jacobs) to identify additional and undiscovered buried utilities.

Examples of the type of geophysical technologies include (these are further described in **Attachment 3**):

- **Ground Penetrating Radar (GPR),** which can detect pipes, including gas pipes, tanks, conduits, cables etc, both metallic and non-metallic at depths up to 30 feet depending on equipment. Sensitivity for both minimum object size and maximum depth detectable depends on equipment selected, soil conditions, etc.
- **Radio Frequency (RF),** involves inducing an RF signal in the pipe or cable and using a receiver to trace it. Some electric and telephone lines emit RF naturally and can be detected without an induced signal. This method requires knowing where the conductive utility can be accessed to induce RF field if necessary.
- **Dual RF,** a modified version of RF detection using multiple frequencies to enhance sensitivity but with similar limitations to RF

- **Ferromagnetic Detectors,** are metal detectors that will detect ferrous and non-ferrous utilities. Sensitivity is limited (such as, a 100 mm iron disk to a depth of about 1 meter, 25 mm steel paper clip to a depth of about 20 cm).
- **Electronic markers,** are emerging technologies that impart a unique electronic signature to materials such as polyethylene pipe to facilitate location and tracing after installation. Promising for future installations but not of help for most existing utilities already in place.

The following procedures shall be used to identify and mark underground utilities during subsurface construction activities on the project:

- Contact utility companies or the state/regional utility protection service (such as Miss Utility) at least two (2) working days prior to intrusive activities to advise of the proposed work and ask them to establish the location of the utility underground installations prior to the start of actual excavation: this is a law. These services will only mark the location of public-utility-owned lines and not Navy-owned utilities. In many cases there will not be any public-utility-owned lines on the Activity. There may also be Base-access issues to overcome.
- Procure and schedule the independent survey.
- The survey contractor shall determine the most appropriate geophysical technique or combinations of techniques to identify the buried utilities on the project site, based on the survey contractor's experience and expertise, types of utilities anticipated to be present and specific site conditions. The types of utilities must be provided to the bidding subcontractors in the SOW and procedures to be used must be specified by the bidder in their bid. It is extremely helpful to provide the sub with utility maps, with the caveat that all utilities are not necessarily depicted.
- The survey subcontractor shall employ the same geophysical techniques used to identify the buried utilities, to survey the proposed path of subsurface investigation/construction work to confirm no buried utilities are present.
- Obtain utility clearances for subsurface work on both public and private property.
- Clearances provided by both the "Miss Utility" service and the Jacobs-subcontracted service are to be in writing, signed by the party conducting the clearance. The Miss Utility service will have standard notification forms/letters which typically simply state that they have been to the site and have done their work. The Jacobs subcontractor shall be required to fill out the form provided in **Attachment 4** (this can be modified for a particular project) indicating that each dig/drill location has been addressed. This documentation requirement (with a copy of the form) needs to be provided in the subcontractor SOW.
- Marking shall be done using the color coding presented in **Attachment 5** defined by the American Public Works Association (APWA). The type of material used for marking must be approved by the Activity prior to marking. Some base commanders have particular issues with persistent spray paint on their sidewalks and streets. Any particular marking requirements need to be provided in the subcontractor SOW.

- Protect and preserve the markings of approximate locations of facilities until the markings are no longer required for safe and proper excavations. If the markings of utility locations are destroyed or removed before excavation commences or is completed, the Project Manager must notify the utility company or utility protection service to inform them that the markings have been destroyed.
- Perform a field check prior to drilling/digging (preferably while the utility location sub is still at the site) to see if field utility markings coincide with locations on utility maps. Look for fire hydrants, valves, manholes, light poles, lighted signs, etc to see if they coincide with utilities identified by the subcontractor.
- Underground utility locations must be physically verified (or dig locations must be physically cleared) by hand digging using wood or fiberglass-handled tools, air knifing, or by some other acceptable means approved by Jacobs when the dig location (e.g. mechanical drilling, excavating) is expected to be within 3 feet of a marked underground system. Hand clearance shall be done to a depth of four feet unless a utility cross-section is available that indicates the utility is at a greater depth. In that event, the hand clearance shall proceed until the documented depth of the utility is reached.
- Conduct a site briefing for employees at the start of the intrusive work regarding the hazards associated with working near the utilities and the means by which the operation will maintain a safe working environment. Detail the method used to isolate the utility and the hazards presented by breaching the isolation.
- Monitor for signs of utilities during advancement of intrusive work (e.g., sudden change in advancement of auger or split spoon during drilling or change in color, texture or density during excavation that could indicate the ground has been previously disturbed).

V. Attachments

1. Example SOW for Utility Location Subcontractor Procurement
2. Services Available for Identifying and Marking Underground Utilities
3. Equipment Used for Identifying Underground Utilities
4. Utility Clearance Documentation Form
5. Utility Marking Color Codes

Attachment 1, Example SOW for Subcontracting Underground Utilities Locating Services

- CTO-XXX
- Scope of Work
- Subsurface Utility Locating
- Site XX
- Navy Activity
- City, State

A licensed and insured utility locator will be subcontracted to identify and mark out subsurface utilities for an environmental investigation/remediation project at Site XX of <<insert name of base, city, and state>>. The subcontractor will need to be available beginning at <<insert time>> on <<insert date>>. It is estimated that the work can be completed within XX days.

Proposed Scope of Work

The subcontractor will identify and mark all subsurface utilities (CHOOSE 1) that lie within a radius of 20 feet of each of XX sampling locations at Site XX shown on the attached Figure 1; (OR) that lie within the bounds of Site XX as delineated on the attached Figure 1. (If multiple sites are to be cleared, provide maps of each site with sample locations or clearance boundaries clearly delineated and a scale provided.)

Utilities will be identified using all reasonably available as-built drawings, electronic locating devices, and any other means necessary to maintain the safety of drilling and sampling personnel and the protection of the base infrastructure. The location of utilities identified from as-built drawings or other maps must be verified in the field prior to marking.

Base utility drawings for the Site(s) (CHOOSE 1) can be found at <<insert specific department and address or phone number on the base>> and should be reviewed by the subcontractor and referenced as part of the utility locating. (OR), will be provided to the subcontractor by Jacobs upon the award of the subcontract. (OR), are not available. Utility drawings shall not be considered definitive and must be field verified.

Field verification will include detection using nonintrusive subsurface detection equipment (magnetometers, GPR, etc) as well as opening manhole covers to verify pipe directions. As part of the bid, the Subcontractor shall provide a list of the various subsurface investigation tools they propose to have available and use at the site and what the limitations are of each tool.

A Jacobs representative shall be present to coordinate utility clearance activities and identify points and features to be cleared.

Field Marking and Documentation

All utilities located within (CHOOSE 1) a 20-ft radius of the XX proposed soil boring locations (OR) within the boundary of the site(s) as identified on the attached figure(s) will be marked using paint (some Bases such as the WNY may have restrictions on the use of permanent paint) and/or pin flags color coded to indicate electricity, gas, water, steam, telephone, TV cable, fiber optic, sewer, etc. The color coding shall

match the industry standard as described on the attached form. In addition, the Buried Utility Location Tracking Form (attached) will be completed by the Subcontractor based upon what is identified in the field during the utility locating and submitted back to Jacobs (field staff or project manager) within 24 hours of completing the utility locating activities.

(OPTIONAL) The subcontractor shall also provide a map (or hand sketch) of the identified utilities to the Engineer within XX days of field demobilization. The map shall include coordinates or ties from fixed surface features to each identified subsurface utility.

Bid Sheet/Payment Units

The subcontractor will bid on a time and materials basis for time spent on site and researching utility maps. Mobilization (including daily travel to the site) should be bid as a lump sum, as well as the preparation of the AHA and any required mapping. The per diem line item should be used if the field crew will require overnight accommodations at the project site.

Health and Safety Requirements

The utility locating subcontractor is to provide and assume responsibility for an adequate corporate Health and Safety Plan for onsite personnel. Standard personal safety equipment including: hard hat, safety glasses, steel-toed boots, gloves are recommended for all project activities. Specific health and safety requirements will be established by the Subcontractor for each project. The health and safety requirements will be subject to the review of Jacobs.

The subcontractor shall also prepare and provide to the Engineer, at least 48 hours prior to mobilization, an acceptable Activity Hazard Analysis (AHA) using the attached AHA form or similar.

It is also required that all subcontractor personnel who will be on site attend the daily 15-minute health and safety tailgate meeting at the start of each day in the field.

Subcontractor personnel showing indications of being under the influence of alcohol or illegal drugs will be sent off the job site and their employers will be notified. Subcontractor personnel under the influence of prescription or over-the-counter medication that may impair their ability to operate equipment will not be permitted to do so. It is expected that the subcontractor will assign them other work and provide a capable replacement (if necessary) to operate the equipment to continue work.

Security

The work will be performed on US Navy property. Jacobs will identify the Subcontractor personnel who will perform the work to the appropriate Navy facility point-of-contact, and will identify the Navy point-of-contact to the Subcontractor crew. The Subcontractor bears final responsibility for coordinating access of his personnel onto Navy property to perform required work. This responsibility includes arranging logistics and providing to Jacobs, in advance or at time of entry as specified, any required identification information for the Subcontractor personnel. Specifically, the following information should be submitted with the bid package for all personnel that will perform the work in question (this information is required to obtain a base pass):

- Name
- Birth Place
- Birth Date
- Social Security Number
- Drivers License State and Number
- Citizenship

Please be advised that no weapons, alcohol, or drugs will be permitted on the Navy facility at any time. If any such items are found, they will be confiscated, and the Subcontractor will be dismissed.

Quality Assurance

The Subcontractor will be licensed and insured to operate in the State of <<state>> and will comply with all applicable federal, state, county and local laws and regulations. The subcontractor will maintain, calibrate, and operate all electronic locating instruments in accordance with the manufacturer's recommendations. Additionally, the Subcontractor shall make all reasonable efforts to review as-built engineering drawings maintained by Base personnel, and shall notify the Jacobs Project Manager in writing (email is acceptable) whenever such documentation was not available or could not be reviewed.

Subcontractor Standby Time

At certain periods during the utility locating activities, the Subcontractor's personnel may be asked to stop work and standby when work may normally occur. During such times, the Subcontractor will cease activities until directed by the Jacobs representative to resume operations. Subcontractor standby time also will include potential delays caused by the Jacobs representative not arriving at the site by the agreed-upon meeting time for start of the work day. Standby will be paid to the Subcontractor at the hourly rate specified in the Subcontractor's Bid Form attached to these specifications.

Cumulative Subcontractor standby will be accrued in increments no shorter than 15 minutes (i.e., an individual standby episode of less than 15 minutes is not chargeable).

During periods for which standby time is paid, the surveying equipment will not be demobilized and the team will remain at the site. At the conclusion of each day, the daily logs for the Subcontractor and Jacobs representative will indicate the amount of standby time incurred by the Subcontractor, if any. Payment will be made only for standby time recorded on Jacobs's daily logs.

Down Time

Should equipment furnished by the Subcontractor malfunction, preventing the effective and efficient prosecution of the work, or inclement weather conditions prevent safe and effective work from occurring, down time will be indicated in the Subcontractor's and Jacobs representative's daily logs. No payment will be made for down time.

Schedule

It is anticipated that the subsurface utility locating activities will occur on <<insert date>>. It is estimated that the above scope will be completed within XXX days.

Attachment 2, Services Available for Identifying and Marking Underground Utilities

The services that are available to us for identifying and marking underground utilities are:

- The Activity's PWC (or similar organization)
- The local public/private utility -run service such as Miss Utility or 811
- Utility location subcontractors (hired by Jacobs)
- Non-contact excavation (vacuum excavation) subcontractor

Each are discussed below.

Navy Public Works Department

A Public Works Department (PWD) is usually present at each Activity. The PWD is responsible for maintaining the public works at the base including management of utilities. In many cases, the PWD has a written permit process in place to identify and mark-out the locations of Navy-owned utilities [Note: The PWD is usually NOT responsible for the locations/mark-outs of non-Navy owned, public utilities (e.g., Washington Gas, Virginia Power, municipal water and sewer). Therefore, it is likely that we will have to contact other organizations besides the PWD to identify non-Navy owned, public utilities].

At some Activities, there may not be a PWD, the PWD may not have a written permit process in place, or the PWD may not take responsibility for utility locating and mark-outs. In these cases, the PWD should still be contacted since it is likely that they will have the best understanding of the utility locations at the Activity (i.e., engineering drawings, institutional knowledge, etc.). Subsequently, the PWD should be brought into a cooperative arrangement (if possible) with the other services employed in utility locating and mark-out in order to have the most comprehensive assessment performed.

At all Activities we should have a contact (name and phone number), and preferably an established relationship, with PWD, either directly or through the NAVFAC Atlantic, Mid-Atlantic, or Washington NTR or Activity Environmental Office that we can work with and contact in the event of problems.

Miss Utility or "811 One Call" Services for Public Utility Mark-outs

Miss Utility or "811 One Call" service centers are information exchange centers for excavators, contractors and property owners planning any kind of excavation or digging. The "811 One Call" center notifies participating public utilities of the upcoming excavation work so they can locate and mark their underground utilities in advance to prevent possible damage to underground utility lines, injury, property damage and service outages. In some instances, such with southeastern Virginia bases, the Navy has entered into agreement with Miss (?) Utilities and is part of the response process for Miss Utilities. Generally, a minimum of 48 hours is required for the public utility mark-outs to be performed. The "811 One Call" services are free to the public. Note that the "811 One Call" centers only coordinate with participating public utilities. There may be some public utilities that do NOT participate in the "One Call" center which may need to be contacted separately. For example, in Washington, DC, the Miss Utility "811 One Call" center does not locate and mark public sewer and water lines. Therefore, the municipal water and sewer authority must be contacted separately to have the sewer and water lines

marked out. The AM should contact the appropriate one-call center to determine their scope of services.

For the Mid-Atlantic region, the following “One Call” service centers are available.

Name	Phone	Website	Comments
Miss Utility of DELMARVA	800-257-7777	www.missutility.net	Public utility mark-outs in Delaware, Maryland, Washington, DC, and Northern Virginia
Miss Utility of Southern Virginia (One Call)	800-552-7001	not available	Public utility mark-outs in Southern Virginia
Miss Utility of Virginia	800-257-7777 800-552-7007	www.missutilityofvirginia.com	General information on public utility mark-outs in Virginia, with links to Miss Utility of DELMARVA and Miss Utility of Southern Virginia (One Call)
Miss Utility of West Virginia, Inc	800-245-4848	none	Call to determine what utilities they work with in West Virginia
North Carolina One Call Center	800-632-4949	www.ncocc.org/ncocc/default.htm	Public Utility Markouts in North Carolina

Private Subcontractors

Utility-locating support is required at some level for most all Jacobs field projects in "clearing" proposed subsurface boring locations on the project site. Utility location and sample clearance can include a comprehensive effort of GIS map interpretation, professional land surveying, field locating, and geophysical surveying. Since we can usually provide our own GIS-related services for projects and our professional land surveying services are normally procured separately, utility-locating subcontractors will normally only be required for some level of geophysical surveying support in the field. This level of geophysical surveying support can range widely from a simple electromagnetic (EM) survey over a known utility line, to a blind geophysical effort, including a ground-penetrating radar (GPR) survey and/or a comprehensive EM survey to delineate and characterize all unknown subsurface anomalies.

The level of service required from the subcontractor will vary depending on the nature of the site. At sites where utility locations are well defined on the maps and recent construction is limited, Jacobs may be confident with a limited effort from a traditional utility-locating subcontractor providing a simple EM survey. At sites where utility locations are not well defined, where recent constructions may have altered utility locations, or the nature of the site makes utility location difficult, Jacobs will require the services of a comprehensive geophysical surveying subcontractor, with a wide range of GPR and EM services available for use on an "as-needed" basis. Typical costs for geophysical surveying subcontractors will range from approximately $200 per day for a simple EM effort (usually one crew member and one instrument) to approximately $1,500 per day for a comprehensive geophysical

surveying effort (usually a two-person crew and multiple instruments). Comprehensive geophysical surveying efforts may also include field data interpretation (and subsequent report preparation) and non-destructive excavation to field-verify utility depths and locations.

The following table provides a list of recommended geophysical surveying support subcontractors that can be used for utility-locating services:

Company Name and Address	Contact Name and Phone Number	Equipment[b]					Other Services[c]		
		1	2	3	4	5	A	B	C
US Radar, Inc.[a] PO Box 319 Matawan, NJ 07747	Ron LaBarca 732-566-2035			√					
Utilities Search, Inc. [a]	Jim Davis 703-369-5758	√				√	√	√	√
So Deep, Inc. [a] 8397 Euclid Avenue Manassas Park, VA 20111	703-361-6005	√					√	√	√
Accurate Locating, Inc. 1327 Ashton Rd., Suite 101 Hanover, MD 21076	Ken Shipley 410-850-0280	√	√						
NAEVA Geophysics, Inc. P.O. Box 7325 Charlottesville, VA 22906	Alan Mazurowski 434-978-3187	√	√	√	√	√	√	√	√
Earth Resources Technology. Inc. 8106 Stayton Rd. Jessup, MD 20794	Peter Li 240-554-0161	√	√	√	√	√	√	√	
Geophex, Ltd. 605 Mercury Street Raleigh, NC 27603	I. J. Won 919-839-8515	√	√	√	√	√	√	√	√

[a] Companies denoted with an asterisk have demonstrated reluctance to assume responsibility for damage to underground utilities or an inability to accommodate the insurance requirements that Jacobs requests for this type of work at many Navy sites.

[b] Equipment types are:

- Simple electromagnetic instruments, usually hand-held
- Other, more innovative, electromagnetic instruments, including larger instruments for more area coverage
- Ground-penetrating radar systems of all kinds
- Audio-frequency detectors of all kinds
- Radio-frequency detectors of all kinds

[c] Other services include:

- Data interpretation and/or report preparation to provide a permanent record of the geophysical survey results and a professional interpretation of the findings, including expected accuracy and precision.
- Non-destructive excavation to field-verify the depths, locations, and types of subsurface utilities.
- Concrete/asphalt coring and pavement/surface restoration.

Non-Contact Excavation Subcontractors

In certain circumstances it may be necessary for utility location to be carried out by non-contact excavation (also known as vacuum excavation). Please refer to the reference list of non-contact excavation subcontractors.

Attachment 3, Equipment Used for Identifying Underground Utilities

This attachment provides a summary of the various types of equipment used for subsurface utility location. It describes the capabilities and limitations of each to help the AM and PM determine if the equipment being proposed by a subcontractor or Navy is adequate. A list of in-house experts that can be used to answer questions you may have is provided below.

Jacobs In-house Utility Location Experts

- Steve Saville/KNV
  Home Office Phone – 720-261-5367
- Nick Jones/DEN
  Home Office Phone- 303-478-0655

Electromagnetic Induction (EMI) Methods

EMI instruments, in general, induce an electromagnetic field into the ground (the primary field) and then record the response (the secondary field), if any. Lateral changes in subsurface conductivity, such as caused by the presence of buried metal or by significant soil variations, cause changes in the secondary field recorded by the instrument and thus enable detection and mapping of the subsurface features. It should be noted that EMI only works for electrically conductive materials--plastic or PVC pipes are generally not detected with EMI. Water and gas lines are commonly plastic, although most new lines include a copper “locator” strip on the top of the PVC to allow for detection with EMI.

EMI technology encompasses a wide range of instruments, each with inherent strengths and weaknesses for applications. One major division of EMI is between “time-domain” and “frequency-domain” instruments that differ in the aspect of the secondary field they detect. Another difference in EMI instruments is the operating frequency they use to transmit the primary field. Audio- and radio-frequencies are often used for utility detection, although other frequencies are also used. Consideration of the type of utility expected, surface features that could interfere with detection, and the “congestion” of utilities in an area, should be made when choosing a particular EMI instrument for a particular site.

One common EMI tool used for utility location is a handheld unit that can be used to quickly scan an area for utilities and allows for marking locations in “real time”. This method is most used by “dig-safe” contractors marking out known utilities prior to excavation. It should be noted that this method works best when a signal (the primary field) can be placed directly onto the line (i.e., by clamping or otherwise connecting to the end of the line visible at the surface, or for larger utilities such as sewers, by running a transmitter through the utility). These types of tools also have a limited capability to scan an area for unknown utilities. Usually this requires having enough area to separate a handheld transmitter at least a hundred feet from the receiver. Whether hunting for unknown, or confirming known, utilities, this method will only detect continuous lengths of metallic conductors.

In addition to the handheld EMI units, larger, more powerful EMI tools are available that provide more comprehensive detection and mapping of subsurface features. Generally, data with these methods are collected on a regular grid in the investigation area, and are then analyzed to locate linear anomalies

that can be interpreted as utilities. These methods will usually detect all subsurface metal (above a minimum size), including pieces of abandoned utilities. In addition, in some situations, backfill can be detected against native soils giving information on trenching and possible utility location. Drawbacks to these methods are that the secondary signals from utilities are often swamped (i.e., undetectable) close to buildings and other cultural features, and that the subsurface at heavily built-up sites may be too complicated to confidently interpret completely.

Hand-held metal detectors (treasure-finders) are usually based on EMI technology. They can be used to locate shallow buried metal associated with utilities (e.g., junctions, utility access holes [e.g., manholes], metallic locators). Advantages of these tools is the ease of use and real-time marking of anomalies. Drawbacks include limited depths of investigations and no data storage capacity.

Ground Penetrating Radar (GPR)

GPR systems transmit radio and microwave frequency (e.g., 80 megahertz to 1,000 megahertz) waves into the ground and then record reflections of those waves coming back to the surface. Reflections of the radar waves typically occur at lithologic changes, subsurface discontinuities, and subsurface structures. Plastic and PVC pipes can sometimes be detected in GPR data, especially if they are shallow, large, and full of a contrasting material such as air in a wet soil, or water in a dry soil. GPR data are usually collected in regular patterns over an area and then analyzed for linear anomalies that can be interpreted as utilities. GPR is usually very accurate in x-y location of utilities, and can be calibrated at a site to give very accurate depth information as well. A significant drawback to GPR is that depth of investigation is highly dependent on background soil conductivity, and it will not work on all sites. It is not uncommon to get only 1 to 2 feet of penetration with the signal in damp, clayey environments. Another drawback to GPR is that sites containing significant fill material (e.g., concrete rubble, scrap metal, garbage) will result in complicated anomalies that are difficult or impossible to interpret.

Magnetic Field Methods

Magnetic field methods rely on detecting changes to the earth's magnetic field caused by ferrous metal objects. This method is usually more sensitive to magnetic metal (i.e., deeper detection) than EMI methods. A drawback to this method is it is more susceptible to being swamped by surface features such as fences and cars. In addition, procedures must usually be implemented that account for natural variations in the earth's background field as it changes throughout the day. One common use of the method is to measure and analyze the gradient of the magnetic field, which eliminates most of the drawbacks to the method. It should be noted this method only detects ferrous metal, primarily iron and steel for utility location applications. Some utility detectors combine magnetic and EMI methods into a single hand-held unit.

Optical Methods

Down the hole cameras may be useful in visually reviewing a pipe for empty conduits and/or vaults.

Buried Utility Location Tracking Form

(Submit to Jacobs PM within 24 hrs of location activities)

Project Location:
Jacobs Project No.:
Jacobs Project Manager: Name/Phone:
Fax:
Email:
Jacobs Field Team Leader: Name/Phone:

Jacobs Purchase Order:

Utility Location Subcontractor:
Subcontractor POC:

Dates of location activities:

	Check each box using an "X" if a buried utility is present within 5 feet of a marked Station ID. If color of the flag or paint differs from listed color, note change in color on the form.																
Station ID	Gas (Yellow)	Electric (Red)	Fiber optic (Orange)	Cable (Orange)	Water (Blue)	San. Sewer (Green)	Storm Sewer (Green)	Steam (Yellow)	Petroleum (Yellow)	Compressed air (Yellow)	Other ____	Other ____	Other ____	Other ____	Date completed	Technician initials	Notes (methods/tools used

The findings of the buried utility location activities summarized herein were conducted in strict accordance with the Jacobs scope of work.

Subcontractor's Signature _____ Date _____

Attachment 5, Utility Marking Color Codes

The following is the standard color code used by industry to mark various types of utilities and other features at a construction site.

- White – Proposed excavations and borings
- Pink – Temporary survey markings
- Red – Electrical power lines, cables, conduits and lighting cables
- Yellow – Gas, oil, steam, petroleum or gaseous materials
- Orange – Communication, alarm or signal lines, cables, or conduits
- Blue – Potable water
- Purple – Reclaimed water, irrigation and slurry lines
- Green – Sewer and storm drain lines

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Groundwater Sampling for Per- and Polyfluoroalkyl Substances (PFAS)

I. Purpose and Scope

This SOP provides guidelines for groundwater sample collection for samples that will be analyzed for per- and polyfluoroalklyl substances (PFAS) via LC/MS/MS Compliant with the most recent version of the Quality Systems Manual (QSM) for which the lab is certified. This SOP should be used in conjunction with approved region-specific groundwater sampling SOPs which provide methods for general and low-flow groundwater sampling. In cases in which information in this SOP conflicts with region-specific groundwater sampling SOPs, this SOP will supersede the information in the general SOPs.

Standard techniques for collecting representative samples are summarized. These procedures are specific to the Navy Comprehensive Long-term Environmental Action Navy (CLEAN) Program. Materials, equipment, and procedures may vary; refer to the Sampling and Analysis Plan and operator's manuals for specific details.

II. Equipment and Materials

A. Equipment and Materials Required

- If installing wells, ensure driller does not use polytetrafluoroethylene (PFTE)-containing drill lube or other drilling lubes containing PFAS. Biolube has been determined to be an acceptable drilling lube for installing wells where PFAS may be of concern. Additionally, Waterra surge blocks have been confirmed to not contain PFAS and may be used for development.
- Groundwater sampling equipment
  - PFAS-free tubing (avoid Teflon, Viton, PTFE and other fluorinated compounds)
    - High density polyethylene (HDPE) tubing (unlined)
    - If Masterflex tubing is needed for peristaltic pumps, Cole Parmer C-Flex (06424 series) and Tygon E-3603 (06509 series) are suitable options
  - PFAS-free Bailer (if using a bailer[1])

[1] Geotech and Waterra offer PFAS free bailer options

  - PFAS-free Pump such as:
    - Geotech PFAS-free Portable Bladder Pump (note, most bladder pumps include a Teflon-lined bladder, but Geotech currently has one model which is Teflon-free).
    - Panacea P120 or P125. The P200 Stainless Steel Pump may also be used, but the standard model contains Teflon at the tube connection. If you are using this Panacea model, you must request one with the "PTFE-free thread sealant option."
    - Waterra stainless foot-valve
    - QED Sample Pro
    - Monsoon or Mega Monsoon submersible pump
    - Grundfos Rediflo2 (this pump contains small Teflon components, but has not been shown to leach, it is less preferable than the other options)
    - Peristaltic pump (may be suitable for shallow locations)
- Groundwater sample containers (HDPE bottle with HDPE screwcap), sample bottles should not be glass as glass may sorb PFAS. Sample bottle caps should not contain Teflon. Notify your project manager (PM) if bottles provided by the lab are glass or contain Teflon parts.
- Laboratory prepared deionized, certified PFAS-free water for field blank collection
- PFAS-free shipping supplies (labels [if available][2], coolers, and ice)
- Loose leaf paper without waterproof coating or a spiralbound notebook (not waterproof) or tablet (see tablet use notes below)
- Metal clip board (if using loose-leaf paper)
- Pen (not Sharpie)
- Nitrile or latex gloves

B. Equipment and Materials to Avoid During Sampling

Equipment and materials used to collect groundwater samples should not contain any fluorinated compounds, Teflon, or synthetic rubber with fluoropolymer elastomers (e.g., Viton).

Specifically, the following material should be avoided during sampling:

- Gore-Tex brand or similar high-performance outdoor clothing, clothing treated with ScotchGuard brand or similar water repellent, fluoropolymer-coated Tyvek, wrinkle-resistant fabrics, and fire-resistant clothing with fluorochemical treatment or anything advertised as water repellant.
- Weather-proof log books with fluorochemical coatings.
- New clothing that has been washed fewer than six times.

The sample collection area should be clear of the following items:

- Pre-packaged food wrappers (e.g., fast food sandwich wrappers, pizza boxes, etc.)
- Microwave popcorn bags

[2] Efforts will be made to obtain PFAS-free labels; however, information on labels is scarce and labels are frequently mounted on PFAS-coated paper to allow for easy removal.

- Blue ice containers
- Non-Stick aluminum foil
- Kim-Wipes
- Sunscreen, insect repellant and other personal hygiene products that may contain PFAS

Research which has not yet been published has allowed us to generate a list of sunscreens and insect repellents which do not contain fluorine. Check with Bill Diguiseppi or Laura Cook on recommendations (because the research is not ours, it cannot be released externally at this time).

The use of electronics (e.g., cell phones and tablets) should be avoided without the implementation of precautionary measures outlined below:

- All devices should be used with clean, ungloved hands and an approved stylus (if desired).

Following the use of a device, hands must be washed with soap and water and clean gloves should be used prior to contact with sampling equipment (bottleware, tubing, etc.).

III. Procedures and Guidelines

Wash hands with dish detergent before sampling and don nitrile gloves. Do not use Kleen Guard powder free nitrile gloves which were shown in research to contain fluorine

Follow Navy CLEAN SOPs for low-flow or conventional groundwater sample collection, depending on site requirements.

A. Sample Collection

Once water quality parameters have stabilized for low-flow purging, samples can be collected. For conventional purging, if water quality parameters do not stabilize, a minimum of 3 well volumes must be purged prior to sample collection.

The steps to be followed for sample collection are as follows:

1. Ensure that the end of the tubing does not touch the ground or equipment. Remove the cap from the sample bottle. Position the sample bottle under the end of the tubing.
    - If the end of the tubing accidentally comes into contact with any surface, cut off 2” – 3” of tubing from the effluent end with deconned tubing cutters or scissors.
2. Fill the bottle. Do not fill the bottle past the middle of the bottle shoulder. Samples do not need to be collected headspace free.
3. Affix labels after bottles have been closed; collect only one sample at a time to avoid mislabeling. Place the samples in a Ziploc bag and pack the sample on ice immediately for shipment to the offsite laboratory. 3M Red packing tape and crystal clear gorilla tape is suitable for packing and fluorine free. Prior to utilizing additional materials please reach out to your PFAS SME.

B. Equipment Decontamination

Whenever possible, use disposable equipment when collecting groundwater samples. If reusable equipment must be used, the equipment must be cleaned/decontaminated between uses. Alconox and Liquinox soap are acceptable for cleaning/decontaminating reusable equipment at PFAS sites. Any water used for cleaning/decontamination must be certified PFAS-free by a laboratory. Consider triple-rinsing.

Once decontaminated, wrap equipment in plastic bags (such as Ziploc) or un-coated aluminum foil, and store away from potential PFAS sources.

Use of Water Quality Equipment and Water Level Indicators

Water quality meters typically do not contain PFAS. However, consistent with general sampling SOPs, disconnect the water quality meter prior to sampling. Some water level indicators do contain small polyvinylidene fluoride (a PFAS constituent for which we do not currently monitor) or less frequently, Teflon, components, but we have not noted cross contamination from water level indicators at any sites. The Durham Geoslope Water Level Indicators and the Solinst Model 101 with the P2 meter have been shown to be fluorine free.

IV. References

United States Environmental Protection Agency (USEPA), 2009. *Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/ Tandem Mass Spectrometry (LC/MS/MS).* September.

United States Navy, 2020. *Interim Per- and Polyfluoroalkyl Substances (PFAS) Site Guidance for NAVFAC Remedial Project Managers (RPMs)/November 2020 Update*. November.

United States Navy, 2015. *Navy Drinking Water Sampling Policy for Perfluorochemicals: Perfluorooctane Sulfonate and Perfluorooctanoic Acid.* September.

Soil Sampling for Per- and Polyfluoroalkyl Substances

I. Purpose

This SOP provides guidelines for soil sample collection and handling for samples that will be analyzed for per- and polyfluoroalkyl substances (PFAS) via LC/MS/MS Compliant with the most recent version of the Quality Systems Manual (QSM) for which the lab is certified at the time of analysis. Standard techniques for collecting representative samples are summarized. These procedures are specific to the Navy Comprehensive Long-term Environmental Action Navy (CLEAN) Program. Materials, equipment, and procedures may vary; refer to the Sampling and Analysis Plan and operator's manuals for specific details.

II. Equipment and Materials

A. Equipment and Materials Required

A hand auger or other device that can be used to remove the soil from the ground. Stainless steel tools, carbon steel tools, or steel DPT tooling with acetate sleeves are preferred for PFAS sampling. Avoid any sampling materials containing PFAS (such as Teflon, Viton, PTFE, or other fluorinated compounds). Any plastic sampling materials should be evaluated thoroughly before selection to ensure they are fluorine-free.

A stainless steel spatula or fluorine-free disposable plastic scoop should be used to remove material from the sampling device.

Unpainted wooden stakes or pin flags

Fiberglass measuring tape (at least 200 feet in length)

GPS Unit

- PFAS-free labels (if available[1]) shipping materials
- Loose leaf paper or a wire-bound notebook without waterproof coating or tablet (see notes on tablet use below)
- Metal clipboard (if using loose-leaf paper)
- Pen (not Sharpie)

Personal protection equipment (rubber or latex gloves, boots, etc.). Check with your subject matter expert (SME) prior to selecting PPE to ensure there are no fluorine-containing components.

[1] Efforts will be made to obtain PFAS-free labels; however, information on labels is scarce and labels are frequently mounted on PFAS-coated paper to allow for easy removal.

Sample jars (sample jars should be made of high density polyethylene (HDPE) as glass jars may sorb PFAS, please notify the project manager [PM] if glass jars are provided by the lab). Sample containers should not contain Teflon lids.

Laboratory-prepared deionized, certified PFAS-free water for field blank collection

B. Equipment and Materials to Avoid During Sampling

Equipment and materials used to collect soil samples should not contain any fluorinated compounds including Teflon or synthetic rubber with fluoropolymer elastomers (e.g. Viton).

If a driller is supporting collection of soil samples in split spoons or acetate DPT sleeves, ensure the driller has not used and will not use drilling lube containing polytetrafluoroethylene (PTFE) or any other fluorine-containing substance. Biolube has been determined to be an acceptable substitute.

Specifically, the following material should be avoided during sampling:

- Gore-Tex brand or similar high-performance outdoor clothing, clothing treated with ScotchGuard brand or similar water repellent, fluoropolymer-coated Tyvek, wrinkle-resistant fabrics, and fire-resistant clothing with fluorochemical treatment or anything advertised as water repellant.
- Weather-proof log books with fluorochemical coatings.
- New clothing that has been washed fewer than six times.

The sample collection area should be clear of the following items:

- Pre-packaged food wrappers (e.g., fast food sandwich wrappers, pizza boxes, etc.)
- Microwave popcorn bags
- Blue ice containers
- Non-stick aluminum foil
- Kim-Wipes
- Sunscreen, insect repellant and other personal hygiene products that may contain PFAS

Contact your PFAS SME for an approved list of sunscreens and insect repellants.

The use of electronics (e.g., cell phones and tablets) should be avoided without the implementation of precautionary measures outlined below:

- All devices should be used with clean, ungloved hands and an approved stylus (if desired).

Following the use of a device, hands must be washed with soap and water and clean gloves should be used prior to contact with sampling equipment (bottleware, tubing, etc.).

III. Procedures and Guidelines

Once the area has been determined to be free of materials potentially containing PFAS, these steps can be followed to collect the soil samples:

Wear protective gear, as specified in the Health and Safety Plan.

To locate samples, identify the correct location using the pin flags or stakes. Proceed to collect a sample from the undisturbed soil adjacent to the marker following steps C and D. If markers are not present, the following procedures will be used.

A. Samples On A Grid

1. Use measuring tape to locate each sampling point on the first grid line as prescribed in the sampling plan. As each point is located, drive a numbered stake in the ground and record its location on the site map and in the field notebook/clipboard.
2. Proceed to sample the points on the grid line.
3. Measure to location where next grid line is to start and stake first sample. For subsequent samples on the line take two orthogonal measurements: one to the previous grid line, and one to the previous sample on the same grid line.
4. Proceed to sample the points on the grid line as described in Section C below.
5. Make sure to stake location after sample collection in case professional surveying is to be completed.
6. Repeat A-3 and A-4 above until all samples are collected from the area.
7. Or, a GPS unit can be used to identify each location based on map coordinates, if available.

B. Non-Grid Samples

1. Use measuring tape to position sampling point at location described in the sampling plan by taking two measurements from fixed landmarks (e.g., corner of house and fence post).
2. Note measurements, landmarks, and sampling point on a sketch in the field notebook, and on a site location map.
3. Proceed to sample as described in Section C below.
4. Make sure to stake location after sample collection in case professional surveying is to be completed.
5. Repeat B-1 through B-4 above until all samples are collected from the area.
6. Or, a GPS unit can be used to identify each location based on map coordinated, if available.

To the extent possible, differentiate between fill and natural soil. If both are encountered at a boring location, sample both as prescribed in the field sampling plan. Do not locate samples in debris, tree roots, or standing water. In residential areas, do not sample in areas where residents' activities may impact the sample (e.g., barbecue areas, beneath eaves of roofs, driveways, garbage areas). If an obstacle prevents sampling at a measured grid point, move as close as possible, but up to a distance of one half the grid spacing in any direction to locate an appropriate sample. If an appropriate location cannot be found, consult with the Field Team Leader (FTL). If the FTL concurs, the sampling point may be deleted from the program. The FTL will contact the Jacobs (CH2M) PM immediately. The PM and Navy Technical Representative (NTR) will discuss whether the point should be deleted from the program. If it is deleted, the PM will follow-up with the NTR in writing.

C. Collecting Samples Using Hand Tools

1. Use a decontaminated stainless steel scoop/trowel or disposable plastic scoop to scrape away surficial organic material (grass, leaves, etc.) adjacent to the stake. New disposable scoops or trowels may also be used to reduce the need for equipment blanks if the disposable scoops have been confirmed by your project PFAS SME to be PFAS free.

2. If sampling:
    - Surface soil: Obtain soil sample by scooping soil using the augering scoop/trowel, starting from the surface and digging down to a depth of about 6 inches, or the depth specified in the workplan.
    - Subsurface soil: Obtain the subsurface soil sample using an auger down to the depths prescribed in the field sampling plan.
3. Record lithologic description and any pertinent observations (such as discoloration) in the field notebook/clipboard.
4. Empty the contents of the scoop/trowel into a decontaminated stainless steel pan or dedicated sealable bag.
5. Repeat this procedure until sufficient soil is collected to meet volume requirements.
6. Homogenize cuttings in the pan using a decontaminated stainless steel utensil or inside the dedicated sealable bag.
7. Transfer sample for analysis into appropriate containers with a decontaminated utensil. Affix labels after bottles have been closed; collect only one sample at a time to avoid mislabeling.
8. Immediately upon collection, all samples for chemical analysis are to be placed in a closed container on ice unless it is not possible to do so. Although unusual and uncommon, there may be instances where it is not possible to have containers with ice at the sample location. In these instances, the samples should be placed on ice as soon as practical and during the time between collection and placing the samples on ice, the samples should be kept as cool as possible.
9. Backfill the hole with soil removed from the borehole. To the extent possible, replace topsoil and grass and attempt to return appearance of sampling area to its pre-sampled condition. For samples in non-residential, unmowed areas, mark the sample number on the stake and leave stake in place. In mowed areas, remove stake.

To Collect Samples Using DPT Methods

1. Decontaminate sampling tubes and other non-dedicated downhole equipment in accordance with SOP *Decontamination of Personnel and Equipment*. Ensure that decontamination water used is PFAS free (do not use water from fire hydrants on-base for steam cleaning unless the water has been demonstrated to be free of PFAS). Additionally, ensure that all decontaminated tools are wrapped in un-coated aluminum foil as needed.
2. Drive sampling tube to the desired sampling depth using the truck-mounted hydraulic percussion hammer. If soil above the desired depth is not to be sampled, first drive the lead rod, without a sampling tube, to the top of the desired depth.
3. Remove the rods and sampling tube from the borehole and remove the sampling tube from the lead rod.
4. Cut open the acetate liner using a specific knife designed to slice the acetate liners (see below).

5. Fill all sample containers, using a decontaminated or dedicated sampling implement. Label the containers, place in Ziploc bags, and immediately place samples on ice for shipment to the laboratory.
6. Decontaminate all non-dedicated downhole equipment (rods, sampling tubes, etc.) in accordance with SOP Decontamination of Personnel and Equipment and ensure decontamination water is from a PFAS-free water source and if equipment is wrapped in aluminum foil that un-coated aluminum foil is used.
7. Backfill borehole at each sampling location with grout or bentonite and repair the surface with like material (bentonite, asphalt patch, concrete, etc.), as required.

D. Equipment Decontamination

Whenever possible, use disposable equipment when collecting soil samples. If reusable equipment must be used, the equipment must be cleaned/decontaminated between uses. Alconox and Liquinox soap are acceptable for cleaning/decontaminating reusable equipment at PFAS sites. Any water used for cleaning/decontamination must be certified PFAS-free by a laboratory. Consider triple-rinsing. Once decontaminated, wrap equipment in plastic bags (such as Ziploc) or un-coated aluminum foil, and store away from potential PFAS sources.

IV. References

United States Environmental Protection Agency (USEPA), 2009. *Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS).* September.

United States Navy, 2020. *Interim Per- and Polyfluoroalkyl Substances (PFAS) Site Guidance for NAVFAC Remedial Project Managers (RPMs)/November 2020 Update.* November.

United States Navy, 2015. *Navy Drinking Water Sampling Policy for Perfluorochemicals: Perfluorooctane Sulfonate and Perfluorooctanoic Acid.* September

LOW-FLOW GROUNDWATER PURGING AND SAMPLING

1.0 PURPOSE

This standard operating procedure (SOP) describes the conventional monitoring well sampling procedures to be used by all U.S. Naval Facilities Engineering Command Northwest (NAVFAC NW) personnel and contractors. Conventional monitoring well sampling procedures are provided in SOP I-C-4, *Groundwater Sampling from Temporary Wells (Piezometers)*.

2.0 PROCEDURE

2.1 PURPOSE

This procedure establishes the method for sampling groundwater monitoring wells for water-borne contaminants and general groundwater chemistry. The objective is to obtain groundwater samples with as little alteration of water chemistry as possible.

2.2 PREPARATION

2.2.1 Site Background Information

A thorough understanding of the purposes of the sampling event should be established prior to commencing field activities. A review of available data obtained from the site and pertinent to the water sampling should also be conducted. Copies of well logs or summary tables regarding well construction information should be available on-site if possible.

Previous groundwater development and sampling logs give a good indication of well purging rates and the types of problems that may be encountered during sampling, such as excessive turbidity and low well yield. They may also indicate where dedicated pumps are placed in the water column.

It is highly recommended that the field sampling team is familiar with the U.S. EPA recommended protocols for low-flow sampling outlined in the April 1996 Ground Water Issue *Low-Flow (Minimal Drawdown) Groundwater Sampling Procedures* (U.S. EPA 1996).

2.2.2 Groundwater Analysis Selection

The requisite field and laboratory analyses should be established prior to performing water sampling. The types and numbers of quality assurance/quality control (QA/QC) samples to be collected (refer to SOP III-B, *Field QC Samples (Water, Soil)*) should be specified in the QA plan developed for the site.

2.3 GROUNDWATER SAMPLING PROCEDURES

Groundwater sampling procedures at a site should include: (1) measurement of depth to groundwater and total depth, (2) assessment of the presence or absence of an immiscible phase (if required by the project plan), (3) assessment of purge parameter stabilization, (4) purging of static water within the well and well bore, and (5) obtaining a groundwater sample. Each step is discussed in sequence below. Depending

upon specific field conditions, additional steps may be necessary. As a rule, at least 24 hours should separate well development and well sampling events.

2.3.1 Measurement of Static Water Level Elevation

The depth to water and the total depth of the well should be measured to the nearest 0.01 foot to provide baseline hydrologic data, to calculate the volume of water in the well, and to provide information on the integrity of the well (e.g., identification of siltation problems). Dependent upon individual project requirements, synoptic water level collection may be required prior to groundwater sampling activities. In the event that synoptic water levels **are not** collected prior to sampling activities, total depth measurements should be collected **after** purging and sampling activities to prevent the suspension of fine-grained sediment that may be present at the bottom of the well. Each well should be marked with a permanent, easily identified reference point for water level measurements whose location and elevation have been surveyed.

An electronic water level meter accurate to 0.01 foot should be used to measure the water level surface and depth of the well. The presence of light, non-aqueous phase liquids (LNAPLs) and/or dense, non-aqueous phase liquids (DNAPLs) in a well requires measurement of the elevation of the top and the bottom of the product, generally using an interface probe. Water levels in such wells must then be corrected for density effects to accurately determine the elevation of the water table.

2.3.2 Decontamination of Equipment

Each piece of non-dedicated equipment should be decontaminated prior to entering the well. Decontamination should also be conducted prior to the start of sampling at a site, even if the equipment is known to be decontaminated subsequent to its last usage. This precaution is taken to minimize the potential for cross-contamination. In addition, each piece of equipment used at the site should be decontaminated prior to leaving the site. Dedicated sampling equipment need only be decontaminated prior to installation within the well. Clean sampling equipment should not be placed directly on the ground or other contaminated surfaces prior to insertion into the well. Dedicated sampling equipment that has been certified by the manufacturer as being decontaminated can be placed in the well without onsite decontamination.

Further details are presented in SOP III-I, *Equipment Decontamination*.

2.3.3 Detection of Immiscible Phase Layers

Unless specified in the project plans, groundwater samples should not be collected from wells with detectable amounts of LNAPL and DNAPL.

2.3.4 Purging Equipment and Use

To help minimize the potential for cross-contamination, well sampling should proceed from the least contaminated to the most contaminated. This order may be changed in the field if conditions warrant, particularly if dedicated sampling equipment is used. If decontamination of tubing is required by the project, Teflon® tubing is recommended. All groundwater removed from potentially contaminated wells should be handled in accordance with the investigation-derived waste (IDW) handling procedures described in SOP I-A-7, *IDW Management*.

Purging should be accomplished by removing groundwater from the well at low flow rates using a pump. According to the U.S. EPA (1996), the rate at which groundwater is removed from the well during purging ideally should be between than 0.1 to 0.5 L/min. The pump intake should be placed in the middle

of the calculated saturated screened interval. The purge rate should be low enough that substantial drawdown (>0.3 foot) in the well does not occur during purging. If a stabilized drawdown in the well can't be achieved and the water level is approaching the top of the screened interval, reduce the flow rate or turn the pump off (for 15 minutes) and allow for recovery. It should be noted whether or not the pump has a check valve. A check valve is required if the pump is shut off. ***Under no circumstances should the well be pumped dry or otherwise over-purged***. Begin pumping at a lower flow rate, if the water draws down to the top of the screened interval again turn pump off and allow for recovery. If two tubing volumes (including the volume of water in the pump and flow cell) have been removed during purging then sampling can proceed next time the pump is turned on. This information should be noted in the field notebook or groundwater sampling log with a recommendation for a different purging and sampling procedure (USEPA, 2012).

Water level measurements should be collected to assess the water level effects of purging. A low purge rate also will reduce the possibility of stripping VOCs from the water, and will reduce the likelihood of mobilizing colloids in the subsurface that are immobile under natural flow conditions.

Water quality parameters should be collected and recorded on a regular basis (every 3-5 minutes) during well evacuation. Field parameters to be collected may include temperature, pH, specific conductance, salinity, dissolved oxygen, Redox potential, and turbidity. At least seven readings should be taken during the purging process unless the field parameters stabilize more quickly. These parameters are measured to demonstrate that the formation water, not stale well casing water, is being evacuated. Purging should be considered complete when the high and low values between three consecutive field parameter measurements stabilize within 10%. Turbidity may be considered stable if values are less than 10 nephelometric turbidity units (NTUs). The criterion for temperature may not be applicable if a submersible pump is used during purging due to the heating of the water by the pump motor. Field personnel should refer to the project-specific Sampling and Analysis Plan (SAP) for specific measurement requirements and well stabilization criteria.

All information obtained during the purging and sampling process should be entered into the field logbook. In addition to the field logbook, the data may be logged on a groundwater sampling log (Figure I-C-5-1 or equivalent). In special situations where LNAPL has been detected in the monitoring well and a groundwater sample is determined to be necessary by the Project Manager, a stilling tube should be inserted into the well prior to well purging. The stilling tube should be composed of a material that meets the performance guidelines for sampling devices. The stilling tube should be inserted into the well to a depth that allows groundwater from the screened interval to be purged and sampled. The bottom of the tube should be set below the upper portion of the screened interval where the LNAPL is entering the well screen. The goal is to sample the aqueous phase (groundwater) while preventing the LNAPL from entering the sampling device. To achieve this goal, the stilling tube must be inserted into the well in a manner that prevents the LNAPL from entering the stilling tube.

One method of doing this is to cover the end of the stilling tube with a membrane or material that will be ruptured by the weight of the pump. A piece of aluminum foil can be placed over the end of the stilling tube. The stilling tube is lowered slowly into the well to the appropriate depth and then attached firmly to the top of the well casing. When the pump is inserted, the weight of the pump breaks the foil covering the end of the tube, and the well can be purged and sampled from below the LNAPL layer. The membrane or material that is used to cover the end of the stilling tube must be fastened firmly so that it remains attached to the stilling tube when ruptured. Moreover, the membrane or material must retain its integrity after it is ruptured. Pieces of the membrane or material must not fall off of the stilling tube into the well. Although aluminum foil is mentioned in this discussion as an example of a material that can be used to

cover the end of the tube, a more chemically inert material may be required, based on the site-specific situation. Stilling tubes should be thoroughly decontaminated prior to each use. Groundwater removed during purging should be collected and stored onsite until its disposition is determined based upon laboratory analytical results. Storage should be in secured containers such as DOT-approved drums. Containers of purge water should be labeled with NAVFAC NW approved labels or paint pens.

2.3.5 Groundwater Sampling Methodology

The well should be sampled when groundwater within it is representative of aquifer conditions and after it has recovered sufficiently to provide enough volume for the groundwater sampling parameters. A period of no more than 2 hours should elapse between purging and sampling to prevent groundwater interaction with the casing and atmosphere. This may not be possible with a slowly recharging well. The water level should be measured and recorded prior to sampling to demonstrate the degree of recovery of the well. Sampling equipment should never be dropped into the well, because this could cause aeration of the water upon impact. In addition, the sampling methodology utilized should allow for the collection of a groundwater sample in as undisturbed a condition as possible, minimizing the potential for volatilization or aeration. This includes minimizing agitation and aeration during transfer to sample containers.

2.3.6 Sample Handling and Preservation

Many of the chemical constituents and physiochemical parameters to be measured or evaluated during groundwater monitoring programs are chemically unstable; therefore, samples must be preserved. The U.S. Environmental Protection Agency document entitled *Test Methods for Evaluating Solid Waste – Physical/Chemical Methods (SW-846)* (U.S. EPA 1995), includes a discussion of appropriate sample preservation procedures. In addition, SW-846 specifies the sample containers that should be used for each constituent or common set of parameters. In general, check with specific laboratory requirements prior to obtaining field samples. In many cases, the laboratory will supply the necessary sample bottles and required preservatives. In some cases, the field team may add preservatives in the field.

Improper sample handling may alter the analytical results of the sample. Samples should be transferred in the field from the sampling equipment directly into the container that has been prepared specifically for that analysis or set of compatible parameters as described in the Quality Assurance Project Plan.

When sampling for VOCs, water samples should be collected in vials or containers specifically designed to prevent loss of VOCs from the sample. An analytical laboratory should provide these vials, preferably by the laboratory that will perform the analysis. Groundwater from the sampling device should be collected in vials by allowing the groundwater to slowly flow along the sides of the vial. Sampling equipment should not touch the interior of the vial. The vial should be filled above the top of the vial to form a positive meniscus with no overflow. No headspace should be present in the sample container once the container has been capped. The sample can be checked for headspace by inverting the sample bottle and tapping the side of the vial to dislodge air bubbles. Sometimes it is not possible to collect a sample without air bubbles, particularly water that is aerated or naturally carbonated. In these cases, the investigator should note the problem to account for possible error. Field logs and laboratory analysis reports should note any headspace in the sample container(s) at the time of receipt by the laboratory, as well as at the time the sample was first transferred to the sample container at the wellhead.

2.3.6.1 Special Handling Considerations

Samples requiring analysis for organics should not be filtered. Samples should not be transferred from one container to another because this could cause aeration or a loss of organic material onto the walls of the container.

Groundwater samples to be analyzed for total and dissolved metals should be obtained sequentially. The sample to be analyzed for total metals, should be obtained directly from the pump and be unfiltered. The second sample should be filtered through a 0.45-micron membrane in-line filter and transferred to a container to be analyzed for dissolved metals. Allow at least 500 ml of effluent to flow through the filter prior to sampling. Any difference in concentration between the total and dissolved fractions may be attributed to the original metallic ion content of the particles and adsorption of ions onto the particles.

2.3.6.2 Field Sampling Preservation

Samples should be preserved immediately upon collection. Ideally, sample jars contain preservatives of known concentration and volume during the initial filling of the jar to a predetermined final sample volume. For example, metals require storage in aqueous media at pH of 2 or less. Typically, 0.5 ml of 1:1 nitric acid added to 500 ml of groundwater will produce a pH less than 2.0. Certain matrices that have alkaline pH (greater than 7) may require more preservative than is typically required. An early assessment of preservation techniques, such as the use of pH strips after initial preservation, may therefore be appropriate. It should be noted that introduction of preservatives will dilute samples, and may require normalization of results. Guidance for the preservation of environmental samples can be found in the EPA "Handbook for Sampling and Sample Preservation of Water and Wastewater:" (U.S. EPA 1982).

3.0 DOCUMENTATION

Information collected during groundwater sampling should be documented in the field logbook in accordance with SOP III-D, *Logbooks*. In addition, groundwater sampling purge logs may be (Figure I-C-5-1 or equivalent) may be filled out in addition to the field logbook. Copies of this information should be sent to the Project Manager and to the project files.

A groundwater sampling log should be documented in the field logbook and contain the following information:

- Identification of well
- Well depth
- Static water level depth
- Presence of immiscible layers
- Purge volume and pumping rate
- Time that the well was purged
- Collection method for immiscible layers
- Sample IDs
- Well evacuation procedure/equipment

- Date and time of collection
- Parameters requested for analysis
- Field analysis data
- Field observations on sampling event
- Name of collector

Figure 1-C-5-1
Groundwater Sampling Log

Project Number: _____ Date: _____

Location: _____ Time: _____

Well Number: _____ Climatic Conditions: _____

Initial Measurements: Static Water Level: _____
Total Depth: _____

Well Purging: Length of Saturated Zone: _____linear feet
Volume of Water to be Evacuated: _____gals./linear ft. x
Linear feet of Saturation x Casing Volumes* = _____gallons
Method of Removal: _____
Pumping Rate: _____ gallons/minute

Well Purge Data:

DATE/ TIME	GALLONS REMOVED	pH	SP. COND.	D.O.	REDOX	TURBIDITY

Sample Withdrawal Method: _____
Appearance of Sample: Color _____
Turbidity _____
Sediment _____
Other _____

Laboratory Analysis Parameters and Preservatives: _____

Number and Types of Sample Containers Used: _____

Sample ID(s): _____

Decontamination Procedures: _____

Notes: _____

Sampled by: _____
Samples delivered to: _____
Date/Time: _____
Transporters: _____

* Capacity of casing (gallons/linear foot): 2”-0.16, 4”-0.65, 6”-1.47, 8”-2.61, 10”-4.08, 12”-5.87

4.0 REFERENCES

SOP I-A-7, IDW Management

SOP *-C-4, *Groundwater Sampling from Temporary Wells (Piezometers)*

SOP III-I, Equipment Decontamination

SOP III-B, Field QC Samples

SOP III-D, Logbooks

U.S. EPA. 1982. Handbook for Sampling and Sample Preservation of Water and Wastewater. EPA-600/4-82-029. September 1982.

U.S. EPA. 1986. RCRA Ground-Water Monitoring Technical Enforcement Guidance Document.

U.S. EPA. 1996. Ground Water Issue, Low-flow (Minimal Drawdown) Groundwater Sampling Procedures. EPA/540/S-95/504. April 1996

U.S. EPA. 1995 and as revised. Test Methods for Evaluating Solid Waste–Physical/Chemical Methods (SW-846). January 1995.

U.S. EPA. 2012. Standard Operating Procedure Low-Stress (Low Flow) / Minimal Drawdown Ground-Water Sample Collection, USEPA, Region 9, Management and Technical Services Division, April 2012.

5.0 ATTACHMENTS

None.

Appendix B
Laboratory Standard Operating Procedures and Department of Defense Environmental Laboratory Accreditation Program

PERRY JOHNSON LABORATORY ACCREDITATION, INC.

Certificate of Accreditation

Perry Johnson Laboratory Accreditation, Inc.
has assessed the Organization of:

Battelle
141 Longwater Drive, Suite 202, Norwell, MA 02061

(Hereinafter called the Organization) and hereby declares that Organization has met the requirements of ISO/IEC 17025:2017 General Requirements for the competence of Testing and Calibration Laboratories and the United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP) requirements identified within the DoD/DOE Quality Systems Manual (DoD/DOE QSM) Version 5.4 October 2021 and is accredited in accordance with the:

United States Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP)

This accreditation demonstrates the technical competence for the defined scope and the operation of a laboratory quality management system
(as outlined by the joint ISO-ILAC-IAF Communiqué dated April 2017):

Environmental Testing
(As detailed in the supplement)

Accreditation claims for such activities shall only be made from the addresses referenced within this certificate. This Accreditation is granted subject to the system rules governing the Accreditation referred to above, and the Organization hereby covenants with the Accreditation Body's duty to observe and comply with the said rules.

Initial Accreditation Date:	*Issue Date:*	*Expiration Date*
November 17, 2016	March 28, 2023	April 30, 2025

For PJLA

Tracy Szerszen
President

Accreditation No:	*Certificate No:*
91667	L23-262

Perry Johnson Laboratory Accreditation, Inc. (PJLA)
755 W. Big Beaver, Suite 1325
Troy, Michigan 48084

The validity of this certificate is maintained through ongoing assessments based on a continuous accreditation cycle. The validity of this certificate should be confirmed through the PJLA website: **www.pjlabs.com**

Certificate of Accreditation: Supplement

Battelle
141 Longwater Drive, Suite 202, Norwell, MA 02061
Contact Name: Jonathan Thorn Phone: 781-681-5565

Accreditation is granted to the facility to perform the following testing:

	Code
Organic	
Draft EPA Method 1633 by Liquid Chromatography Tandem Mass Spectrometry (LC/MS/MS)	10123429
Aqueous	
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	9490
1H, 1H, 2H, 2H-Perfluorodecanesulfonic Acid (8:2 Fluorotelomersulfonic Acid, 8:2FTS)	6948
1H, 1H, 2H, 2H-Perfluorohexanesulfonic Acid (4:2 Fluorotelomersulfonic Acid, 4:2FTS)	6946
1H, 1H, 2H, 2H-Perfluorooctanesulfonic Acid (6:2 Fluorotelomersulfonic Acid, 6:2FTS)	6947
2H,2H,3H,3H-Perfluorodecanoic Acid (7:3 FTCA, 3-Perfluoroheptyl Propanoic Acid)	9340
2H,2H,3H,3H-Perfluorooctanoic Acid (5:3 FTCA)	9338
4,4,5,5,6,6,6-Heptafluorohexanoi Acid (3:3 FTCA, 3-Perfluoropropyl Propanoic Acid)	9353
4,8-dioxa-3H-perfluorononanoic Acid (ADONA)	6951
9-Chlorohexadecafluoro-3-Oxanonane-1-Sulfonic Acid (9-Cl-PF3ONS)	6952
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	9460
N-ethyl perfluorooctanesulfonamide (EtFOSA)	9395
N-ethyl perfluorooctanesulfonamidoacetic Acid (EtFOSAA)	4847
N-ethyl perfluorooctanesulfonamidoethanol (EtFOSE)	9431
N-methyl perfluorooctanesulfonamide (MeFOSA)	9433
N-methyl perfluorooctanesulfonamidoacetic Acid (MeFOSAA)	4846
N-methyl perfluorooctanesulfonamidoethanol (MeFOSE)	6949
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	6956
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	6957
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	6965
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	6966
Perfluorobutanesulfonic Acid (PFBS)	6918
Perfluorobutanoic Acid (PFBA)	6915
Perfluorodecanesulfonic Acid (PFDS)	6920
Perfluorodecanoic Acid (PFDA)	6905
Perfluorododecanesulfonic Acid (PFDoS)	6923
Perfluorododecanoic Acid (PFDoA)	6903
Perfluoroheptanesulfonic Acid (PFHpS)	9470
Perfluoroheptanoic Acid (PFHpA)	6908
Perfluorohexanesulfonic Acid (PFHxS)	6927
Perfluorohexanoic Acid (PFHxA)	6913
Perfluorononanesulfonic Acid (PFNS)	6929
Perfluorononanoic Acid (PFNA)	6906
Perfluorooctanesulfonamide (PFOSA)	6917
Perfluorooctanesulfonic Acid (PFOS)	6931
Perfluorooctanoic Acid (PFOA)	6912
Perfluoropentanesulfonic Acid (PFPeS)	6934

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Aqueous	
Perfluoropentanoic Acid (PFPeA)	6914
Perfluorotetradecanoic Acid (PFTeDA)	6902
Perfluorotridecanoic Acid (PFTrDA)	9563
Perfluoroundecanoic Acid (PFUnA)	6904
Solid	
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	9490
1H, 1H, 2H, 2H-Perfluorodecanesulfonic Acid (8:2 Fluorotelomersulfonic Acid, 8:2FTS)	6948
1H, 1H, 2H, 2H-Perfluorohexanesulfonic Acid (4:2 Fluorotelomersulfonic Acid, 4:2FTS)	6946
1H, 1H, 2H, 2H-Perfluorooctanesulfonic Acid (6:2 Fluorotelomersulfonic Acid, 6:2FTS)	6947
2H,2H,3H,3H-Perfluorodecanoic Acid (7:3 FTCA, 3-Perfluoroheptyl Propanoic Acid)	9340
2H,2H,3H,3H-Perfluorooctanoic Acid (5:3 FTCA)	9338
4,4,5,5,6,6,6-Heptafluorohexanoi Acid (3:3 FTCA, 3-Perfluoropropyl Propanoic Acid)	9353
4,8-dioxa-3H-perfluorononanoic Acid (ADONA)	6951
9-Chlorohexadecafluoro-3-Oxanonane-1-Sulfonic Acid (9-Cl-PF3ONS)	6952
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA)	9460
N-ethyl perfluorooctanesulfonamide (EtFOSA)	9395
N-ethyl perfluorooctanesulfonamidoacetic Acid (EtFOSAA)	4847
N-ethyl perfluorooctanesulfonamidoethanol (EtFOSE)	9431
N-methyl perfluorooctanesulfonamide (MeFOSA)	9433
N-methyl perfluorooctanesulfonamidoacetic Acid (MeFOSAA)	4846
N-methyl perfluorooctanesulfonamidoethanol (MeFOSE)	6949
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	6956
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	6957
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	6965
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	6966
Perfluorobutanesulfonic Acid (PFBS)	6918
Perfluorobutanoic Acid (PFBA)	6915
Perfluorodecanesulfonic Acid (PFDS)	6920
Perfluorodecanoic Acid (PFDA)	6905
Perfluorododecanesulfonic Acid (PFDoS)	6923
Perfluorododecanoic Acid (PFDoA)	6903
Perfluoroheptanesulfonic Acid (PFHpS)	9470
Perfluoroheptanoic Acid (PFHpA)	6908
Perfluorohexanesulfonic Acid (PFHxS)	6927
Perfluorohexanoic Acid (PFHxA)	6913
Perfluorononanesulfonic Acid (PFNS)	6929

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Organic	
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Solid	
Perfluorononanoic Acid (PFNA)	6906
Perfluorooctanesulfonamide (PFOSA)	6917
Perfluorooctanesulfonic Acid (PFOS)	6931
Perfluorooctanoic Acid (PFOA)	6912
Perfluoropentanesulfonic Acid (PFPeS)	6934
Perfluoropentanoic Acid (PFPeA)	6914
Perfluorotetradecanoic Acid (PFTeDA)	6902
Perfluorotridecanoic Acid (PFTrDA)	9563
Perfluoroundecanoic Acid (PFUnA)	6904
Tissue	
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	9490
1H, 1H, 2H, 2H-Perfluorodecanesulfonic Acid (8:2 Fluorotelomersulfonic Acid, 8:2FTS)	6948
1H, 1H, 2H, 2H-Perfluorohexanesulfonic Acid (4:2 Fluorotelomersulfonic Acid, 4:2FTS)	6946
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2H,2H,3H,3H-Perfluorodecanoic Acid (7:3 FTCA, 3-Perfluoroheptyl Propanoic Acid)	9340
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4,4,5,5,6,6,6-Heptafluorohexanoi Acid (3:3 FTCA, 3-Perfluoropropyl Propanoic Acid)	9353
4,8-dioxa-3H-perfluorononanoic Acid (ADONA)	6951
9-Chlorohexadecafluoro-3-Oxanonane-1-Sulfonic Acid (9-Cl-PF3ONS)	6952
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N-methyl perfluorooctanesulfonamidoacetic Acid (MeFOSAA)	4846
N-methyl perfluorooctanesulfonamidoethanol (MeFOSE)	6949
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	6956
Perfluoro(2-ethoxyethane)sulfonic acid (PFEESA)	6957
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	6965
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	6966
Perfluorobutanesulfonic Acid (PFBS)	6918
Perfluorobutanoic Acid (PFBA)	6915
Perfluorodecanesulfonic Acid (PFDS)	6920
Perfluorodecanoic Acid (PFDA)	6905
Perfluorododecanesulfonic Acid (PFDoS)	6923
Perfluorododecanoic Acid (PFDoA)	6903

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Accreditation is granted to the facility to perform the following testing:

	Code
Organic	
Draft EPA Method 1633 by Liquid Chromatography Tandem Mass Spectrometry (LC/MS/MS)	10123429
Tissue	
Perfluoroheptanesulfonic Acid (PFHpS)	9470
Perfluoroheptanoic Acid (PFHpA)	6908
Perfluorohexanesulfonic Acid (PFHxS)	6927
Perfluorohexanoic Acid (PFHxA)	6913
Perfluorononanesulfonic Acid (PFNS)	6929
Perfluorononanoic Acid (PFNA)	6906
Perfluorooctanesulfonamide (PFOSA)	6917
Perfluorooctanesulfonic Acid (PFOS)	6931
Perfluorooctanoic Acid (PFOA)	6912
Perfluoropentanesulfonic Acid (PFPeS)	6934
Perfluoropentanoic Acid (PFPeA)	6914
Perfluorotetradecanoic Acid (PFTeDA)	6902
Perfluorotridecanoic Acid (PFTrDA)	9563
Perfluoroundecanoic Acid (PFUnA)	6904
EPA 533 by Liquid Chromatography Tandem Mass Spectrometry (LC/MS/MS)	10091619
Drinking Water	
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	9490
1H, 1H, 2H, 2H-Perfluorodecane Sulfonic Acid (8:2 FTS)	6948
1H, 1H, 2H, 2H-Perfluorohexane Sulfonic Acid (4:2 FTS)	6946
1H, 1H, 2H, 2H-Perfluorooctane Sulfonic Acid (6:2 FTS)	6947
9-Chlorohexadecafluoro-3-Oxanonane-1-Sulfonic Acid (9-Cl-PF3ONS)	6952
Ammonium 4,8-Dioxa-3H-Perfluorononanoate (ADONA)	6953
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA) – GenX	9460
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	6956
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	6957
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	6965
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	6966
Perfluorobutanesulfonic Acid (PFBS)	6918
Perfluorobutanoic Acid (PFBA)	6915
Perfluorodecanoic Acid (PFDA)	6905
Perfluorododecanoic Acid (PFDoA)	6903
Perfluoroheptanesulfonic Acid (PFHpS)	9470
Perfluoroheptanoic Acid (PFHpA)	6908
Perfluorohexanesulfonic Acid (PFHxS)	6927
Perfluorohexanoic Acid (PFHxA)	6913
Perfluorononanoic Acid (PFNA)	6906

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Contact Name: Jonathan Thorn Phone: 781-681-5565

Accreditation is granted to the facility to perform the following testing:

	Code
Organic	
EPA 533 by Liquid Chromatography Tandem Mass Spectrometry (LC/MS/MS)	10091619
Drinking Water	
Perfluorooctanesulfonic Acid (PFOS)	6931
Perfluorooctanoic Acid (PFOA)	6912
Perfluoropentanesulfonic Acid (PFPeS)	6934
Perfluoropentanoic Acid (PFPeA)	6914
Perfluoroundecanoic Acid (PFUnA)	6904
EPA 537.1.1 by Liquid Chromatography Tandem Mass Spectrometry (LC/MS/MS)	10091642
Drinking Water	
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	9490
9-Chlorohexadecafluoro-3-Oxanonane-1-Sulfonic Acid (9-Cl-PF3ONS)	6952
Ammonium 4,8-Dioxa-3H-Perfluorononanoate (ADONA)	6953
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA) – GenX	9460
N-Ethylperfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	4846
N-Methylperfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	4847
Perfluorobutanesulfonic Acid (PFBS)	6918
Perfluorodecanoic Acid (PFDA)	6905
Perfluorododecanoic Acid (PFDoA)	6903
Perfluoroheptanoic Acid (PFHpA)	6908
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Perfluorohexanoic Acid (PFHxA)	6913
Perfluorononanoic Acid (PFNA)	6906
Perfluorooctanesulfonic Acid (PFOS)	6931
Perfluorooctanoic Acid (PFOA)	6912
Perfluorotetradecanoic Acid (PFTeDA)	6902
Perfluorotridecanoic Acid (PFTrDA)	9563
Perfluoroundecanoic Acid (PFUnA)	6904
EPA 8081 MOD (Battelle SOP 5-128) by Gas Chromatography Electron Capture Detector (GC/ECD)	10178402
Aqueous	
2,4'-DDD	8580
2,4'-DDE	8585
2,4'-DDT	8590
4,4'-DDD	7355
4,4'-DDE	7360
4,4'-DDT	7365
Aldrin	7025
alpha-BHC (a-BHC, alpha-Hexachlorocyclohexane)	7110
alpha-Chlordane (cis-Chlordane)	7240

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Accreditation is granted to the facility to perform the following testing:

	Code
Organic	
EPA 8081 MOD (Battelle SOP 5-128) by Gas Chromatography Electron Capture Detector (GC/ECD)	10178402
Aqueous	
beta-BHC (b-BHC, beta-Hexachlorocyclohexane)	7115
Chlorpyrifos (Dursban)	7300
cis-Nonachlor	7925
delta-BHC (d-BHC)	7105
Dieldrin	7470
Endosulfan I	7510
Endosulfan II	7515
Endosulfan Sulfate	7520
Endrin	7540
Endrin Aldehyde	7530
Endrin Ketone	7535
gamma-BHC (γ-BHC, Lindane)	7120
gamma-Chlordane	7245
Heptachlor	7685
Heptachlor Epoxide	7690
Hexachlorobenzene	6275
Methoxychlor	7810
Mirex	7870
Oxychlordane	3890
PCB-101 (2,2',4,5,5'-Pentachlorobiphenyl)	8980
PCB-105 (2,3,3',4,4'-Pentachlorobiphenyl)	8985
PCB-110 (2,3,3',4',6-Pentachlorobiphenyl)	8990
PCB-118 (2,3',4,4',5-Pentachlorobiphenyl)	8995
PCB-126 (3,3',4,4',5-Pentachlorobiphenyl)	9015
PCB-128 (2,2',3,3',4,4'-Hexachlorobiphenyl)	9020
PCB-129 (2,2',3,3',4,5-Hexachlorobiphenyl)	9118
PCB-138 (2,2',3,4,4',5'-Hexachlorobiphenyl)	9025
PCB-153 (2,2',4,4',5,5'-Hexachlorobiphenyl)	9040
PCB-169 (3,3',4,4',5,5'-Hexachlorobiphenyl)	9060
PCB-170 (2,2',3,3',4,4',5-Heptachlorobiphenyl)	9065
PCB-18 (2,2',5-Trichlorobiphenyl)	8930
PCB-180 (2,2',3,4,4',5,5'-Heptachlorobiphenyl)	9134
PCB-183 (2,2',3,4,4',5',6-Heptachlorobiphenyl)	9075
PCB-184 (2,2',3,4,4',6,6'-Heptachlorobiphenyl)	9139
PCB-187 (2,2',3,4',5,5',6-Heptachlorobiphenyl)	9080
PCB-195 (2,2',3,3',4,4',5,6-Octachlorobiphenyl)	9103

Certificate of Accreditation: Supplement

Battelle
141 Longwater Drive, Suite 202, Norwell, MA 02061
Contact Name: Jonathan Thorn Phone: 781-681-5565

Accreditation is granted to the facility to perform the following testing:

	Code
Organic	
EPA 8081 MOD (Battelle SOP 5-128) by Gas Chromatography Electron Capture Detector (GC/ECD)	10178402
Aqueous	
PCB-206 (2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl)	9095
PCB-209 (2,2',3,3',4,4',5,5',6,6'-Decachlorobiphenyl)	9105
PCB-28 (2,4,4'-Trichlorobiphenyl)	9252
PCB-44 (2,2',3,5'-Tetrachlorobiphenyl)	8945
PCB-49 (2,2',4,5'-Tetrachlorobiphenyl)	8950
PCB-52 (2,2',5,5'-Tetrachlorobiphenyl)	8955
PCB-66 (2,3',4,4'-Tetrachlorobiphenyl)	8960
PCB-77 (3,3',4,4'-Tetrachlorobiphenyl)	8965
PCB-8 (2,4'-Dichlorobiphenyl)	9256
PCB-87 (2,2',3,4,5'-Pentachlorobiphenyl)	8975
trans-Nonachlor	7910
Solid	
2,4'-DDD	8580
2,4'-DDE	8585
2,4'-DDT	8590
4,4'-DDD	7355
4,4'-DDE	7360
4,4'-DDT	7365
Aldrin	7025
alpha-BHC (a-BHC, alpha-Hexachlorocyclohexane)	7110
alpha-Chlordane (cis-Chlordane)	7240
beta-BHC (b-BHC, beta-Hexachlorocyclohexane)	7115
Chlorpyrifos (Dursban)	7300
cis-Nonachlor	7925
delta-BHC (d-BHC)	7105
Dieldrin	7470
Endosulfan I	7510
Endosulfan II	7515
Endosulfan Sulfate	7520
Endrin	7540
Endrin Aldehyde	7530
Endrin Ketone	7535
gamma-BHC (γ-BHC, Lindane)	7120
gamma-Chlordane	7245
Heptachlor	7685
Heptachlor Epoxide	7690

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Organic	
EPA 8081 MOD (Battelle SOP 5-128) by Gas Chromatography Electron Capture Detector (GC/ECD)	10178402
Solid	
Hexachlorobenzene	6275
Methoxychlor	7810
Mirex	7870
Oxychlordane	3890
PCB-101 (2,2',4,5,5'-Pentachlorobiphenyl)	8980
PCB-105 (2,3,3',4,4'-Pentachlorobiphenyl)	8985
PCB-110 (2,3,3',4',6-Pentachlorobiphenyl)	8990
PCB-118 (2,3',4,4',5-Pentachlorobiphenyl)	8995
PCB-126 (3,3',4,4',5-Pentachlorobiphenyl)	9015
PCB-128 (2,2',3,3',4,4'-Hexachlorobiphenyl)	9020
PCB-129 (2,2',3,3',4,5-Hexachlorobiphenyl)	9118
PCB-138 (2,2',3,4,4',5'-Hexachlorobiphenyl)	9025
PCB-153 (2,2',4,4',5,5'-Hexachlorobiphenyl)	9040
PCB-169 (3,3',4,4',5,5'-Hexachlorobiphenyl)	9060
PCB-170 (2,2',3,3',4,4',5-Heptachlorobiphenyl)	9065
PCB-18 (2,2',5-Trichlorobiphenyl)	8930
PCB-180 (2,2',3,4,4',5,5'-Heptachlorobiphenyl)	9134
PCB-183 (2,2',3,4,4',5',6-Heptachlorobiphenyl)	9075
PCB-184 (2,2',3,4,4',6,6'-Heptachlorobiphenyl)	9139
PCB-187 (2,2',3,4',5,5',6-Heptachlorobiphenyl)	9080
PCB-195 (2,2',3,3',4,4',5,6-Octachlorobiphenyl)	9103
PCB-206 (2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl)	9095
PCB-209 (2,2',3,3',4,4',5,5',6,6'-Decachlorobiphenyl)	9105
PCB-28 (2,4,4'-Trichlorobiphenyl)	9252
PCB-44 (2,2',3,5'-Tetrachlorobiphenyl)	8945
PCB-49 (2,2',4,5'-Tetrachlorobiphenyl)	8950
PCB-52 (2,2',5,5'-Tetrachlorobiphenyl)	8955
PCB-66 (2,3',4,4'-Tetrachlorobiphenyl)	8960
PCB-77 (3,3',4,4'-Tetrachlorobiphenyl)	8965
PCB-8 (2,4'-Dichlorobiphenyl)	9256
PCB-87 (2,2',3,4,5'-Pentachlorobiphenyl)	8975
trans-Nonachlor	7910
Tissue	
2,4'-DDD	8580
2,4'-DDE	8585
2,4'-DDT	8590

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Battelle
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Accreditation is granted to the facility to perform the following testing:

	Code
Organic	
EPA 8081 MOD (Battelle SOP 5-128) by Gas Chromatography Electron Capture Detector (GC/ECD)	10178402
Tissue	
4,4'-DDD	7355
4,4'-DDE	7360
4,4'-DDT	7365
Aldrin	7025
alpha-BHC (a-BHC, alpha-Hexachlorocyclohexane)	7110
alpha-Chlordane (cis-Chlordane)	7240
beta-BHC (b-BHC, beta-Hexachlorocyclohexane)	7115
Chlorpyrifos (Dursban)	7300
cis-Nonachlor	7925
delta-BHC (d-BHC)	7105
Dieldrin	7470
Endosulfan I	7510
Endosulfan II	7515
Endosulfan Sulfate	7520
Endrin	7540
Endrin Aldehyde	7530
Endrin Ketone	7535
gamma-BHC (γ-BHC, Lindane)	7120
gamma-Chlordane	7245
Heptachlor	7685
Heptachlor Epoxide	7690
Hexachlorobenzene	6275
Methoxychlor	7810
Mirex	7870
Oxychlordane	3890
PCB-101 (2,2',4,5,5'-Pentachlorobiphenyl)	8980
PCB-105 (2,3,3',4,4'-Pentachlorobiphenyl)	8985
PCB-110 (2,3,3',4',6-Pentachlorobiphenyl)	8990
PCB-118 (2,3',4,4',5-Pentachlorobiphenyl)	8995
PCB-126 (3,3',4,4',5-Pentachlorobiphenyl)	9015
PCB-128 (2,2',3,3',4,4'-Hexachlorobiphenyl)	9020
PCB-129 (2,2',3,3',4,5-Hexachlorobiphenyl)	9118
PCB-138 (2,2',3,4,4',5'-Hexachlorobiphenyl)	9025
PCB-153 (2,2',4,4',5,5'-Hexachlorobiphenyl)	9040
PCB-169 (3,3',4,4',5,5'-Hexachlorobiphenyl)	9060
PCB-170 (2,2',3,3',4,4',5-Heptachlorobiphenyl)	9065

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	Code
Organic	
EPA 8081 MOD (Battelle SOP 5-128) by Gas Chromatography Electron Capture Detector (GC/ECD)	10178402
Tissue	
PCB-18 (2,2',5-Trichlorobiphenyl)	8930
PCB-180 (2,2',3,4,4',5,5'-Heptachlorobiphenyl)	9134
PCB-183 (2,2',3,4,4',5',6-Heptachlorobiphenyl)	9075
PCB-184 (2,2',3,4,4',6,6'-Heptachlorobiphenyl)	9139
PCB-187 (2,2',3,4',5,5',6-Heptachlorobiphenyl)	9080
PCB-195 (2,2',3,3',4,4',5,6-Octachlorobiphenyl)	9103
PCB-206 (2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl)	9095
PCB-209 (2,2',3,3',4,4',5,5',6,6'-Decachlorobiphenyl)	9105
PCB-28 (2,4,4'-Trichlorobiphenyl)	9252
PCB-44 (2,2',3,5'-Tetrachlorobiphenyl)	8945
PCB-49 (2,2',4,5'-Tetrachlorobiphenyl)	8950
PCB-52 (2,2',5,5'-Tetrachlorobiphenyl)	8955
PCB-66 (2,3',4,4'-Tetrachlorobiphenyl)	8960
PCB-77 (3,3',4,4'-Tetrachlorobiphenyl)	8965
PCB-8 (2,4'-Dichlorobiphenyl)	9256
PCB-87 (2,2',3,4,5'-Pentachlorobiphenyl)	8975
trans-Nonachlor	7910
EPA 8270E MOD (Battelle SOP 5-157) by Gas Chromatography Mass Spectrometry (GC/MS)	10242543
Aqueous	
1,4-Dichlorobenzene	4620
1-Methylnaphthalene	6380
1-Methylphenanthrene	9501
2,3,5-Trimethylnaphthalene	6852
2,6-Dimethylnaphthalene	6188
2-Chloronaphthalene	5795
2-Methylnaphthalene	6385
2-Methylphenanthrene	4953
3,6-Dimethylphenanthrene	5957
Acenaphthene	5500
Acenaphthylene	5505
Anthracene	5555
Benzo(a)Anthracene	5575
Benzo(a)Pyrene	5580
Benzo(b)Fluoranthene	5585
Benzo(b)Thiophene	NC
Benzo(e)Pyrene	5605

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	Code
Organic	
EPA 8270E MOD (Battelle SOP 5-157) by Gas Chromatography Mass Spectrometry (GC/MS)	10242543
Aqueous	
Benzo(g,h,i)Perylene	5590
Benzo(k)Fluoranthene	5600
Chrysene	5855
cis-Decalin	4621
Dibenz(a,h)Anthracene	5895
Dibenzofuran	5905
Dibenzothiophene	5910
Fluoranthene	6265
Fluorene	6270
Indeno(1,2,3,cd)Pyrene	6315
Naphthalene	5005
Perylene	6608
Phenanthrene	6615
Pyrene	6665
trans-Decalin	9587
Solid	
1,4-Dichlorobenzene	4620
1-Methylnaphthalene	6380
1-Methylphenanthrene	9501
2,3,5-Trimethylnaphthalene	6852
2,6-Dimethylnaphthalene	6188
2-Chloronaphthalene	5795
2-Methylnaphthalene	6385
2-Methylphenanthrene	4953
3,6-Dimethylphenanthrene	5957
Acenaphthene	5500
Acenaphthylene	5505
Anthracene	5555
Benzo(a)Anthracene	5575
Benzo(a)Pyrene	5580
Benzo(b)Fluoranthene	5585
Benzo(b)Thiophene	NC
Benzo(e)Pyrene	5605
Benzo(g,h,i)Perylene	5590
Benzo(k)Fluoranthene	5600
Chrysene	5855

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	Code
Organic	
EPA 8270E MOD (Battelle SOP 5-157) by Gas Chromatography Mass Spectrometry (GC/MS)	10242543
Solid	
cis-Decalin	4621
Dibenz(a,h)Anthracene	5895
Dibenzofuran	5905
Dibenzothiophene	5910
Fluoranthene	6265
Fluorene	6270
Indeno(1,2,3,cd)Pyrene	6315
Naphthalene	5005
Perylene	6608
Phenanthrene	6615
Pyrene	6665
trans-Decalin	9587
Tissue	
1,4-Dichlorobenzene	4620
1-Methylnaphthalene	6380
1-Methylphenanthrene	9501
2,3,5-Trimethylnaphthalene	6852
2,6-Dimethylnaphthalene	6188
2-Chloronaphthalene	5795
2-Methylnaphthalene	6385
2-Methylphenanthrene	4953
3,6-Dimethylphenanthrene	5957
Acenaphthene	5500
Acenaphthylene	5505
Anthracene	5555
Benzo(a)Anthracene	5575
Benzo(a)Pyrene	5580
Benzo(b)Fluoranthene	5585
Benzo(b)Thiophene	NC
Benzo(e)Pyrene	5605
Benzo(g,h,i)Perylene	5590
Benzo(k)Fluoranthene	5600
Chrysene	5855
cis-Decalin	4621
Dibenz(a,h)Anthracene	5895
Dibenzofuran	5905

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	Code
Organic	
EPA 8270E MOD (Battelle SOP 5-157) by Gas Chromatography Mass Spectrometry (GC/MS)	10242543
Tissue	
Dibenzothiophene	5910
Fluoranthene	6265
Fluorene	6270
Indeno(1,2,3,cd)Pyrene	6315
Naphthalene	5005
Perylene	6608
Phenanthrene	6615
Pyrene	6665
trans-Decalin	9587
EPA 8270E MOD (Battelle SOP 5-315) by Gas Chromatography Mass Spectrometry (GC/MS)	10242543
Aqueous	
2,4'-DDD	8580
2,4'-DDE	8585
2,4'-DDT	8590
4,4'-DDD	7355
4,4'-DDE	7360
4,4'-DDT	7365
Biphenyl	5640
PCB-1 (2-Chlorobiphenyl, 2-Monochlorobiphenyl)	8915
PCB-100 (2,2',4,4',6-Pentachlorobiphenyl)	9177
PCB-101 (2,2',4,5,5'-Pentachlorobiphenyl)	8980
PCB-104 (2,2',4,6,6'-Pentachlorobiphenyl)	9182
PCB-105 (2,3,3',4,4'-Pentachlorobiphenyl)	8985
PCB-11 (3,3'-Dichlorobiphenyl)	8925
PCB-110 (2,3,3',4',6-Pentachlorobiphenyl)	8990
PCB-114 (2,3,4,4',5-Pentachlorobiphenyl)	9005
PCB-115 (2,3,4,4',6-Pentachlorobiphenyl)	9219
PCB-118 (2,3',4,4',5-Pentachlorobiphenyl)	8995
PCB-12 (3,4-Dichlorobiphenyl)	9270
PCB-123 (2,3',4,4',5'-Pentachlorobiphenyl)	9000
PCB-124 (2,3',4',5,5'-Pentachlorobiphenyl)	9222
PCB-125 (2,3',4',5',6-Pentachlorobiphenyl)	9224
PCB-126 (3,3',4,4',5-Pentachlorobiphenyl)	9015
PCB-127 (3,3',4,5,5'-Pentachlorobiphenyl)	9260
PCB-128 (2,2',3,3',4,4'-Hexachlorobiphenyl)	9020
PCB-13 (3,4'-Dichlorobiphenyl)	9269

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	Code
Organic	
EPA 8270E MOD (Battelle SOP 5-315) by Gas Chromatography Mass Spectrometry (GC/MS)	10242543
Aqueous	
PCB-130 (2,2',3,3',4,5'-Hexachlorobiphenyl)	9117
PCB-131 (2,2',3,3',4,6-Hexachlorobiphenyl)	9121
PCB-134 (2,2',3,3',5,6-Hexachlorobiphenyl)	9128
PCB-135 (2,2',3,3',5,6'-Hexachlorobiphenyl)	9127
PCB-136 (2,2',3,3',6,6'-Hexachlorobiphenyl)	9130
PCB-137 (2,2',3,4,4',5-Hexachlorobiphenyl)	9138
PCB-138 (2,2',3,4,4',5'-Hexachlorobiphenyl)	9025
PCB-139 (2,2',3,4,4',6-Hexachlorobiphenyl)	9141
PCB-140 (2,2',3,4,4',6'-Hexachlorobiphenyl)	9140
PCB-141 (2,2',3,4,5,5'-Hexachlorobiphenyl)	9030
PCB-144 (2,2',3,4,5',6-Hexachlorobiphenyl)	9150
PCB-146 (2,2',3,4',5,5'-Hexachlorobiphenyl)	9144
PCB-149 (2,2',3,4',5',6-Hexachlorobiphenyl)	9151
PCB-15 (4,4'-Dichlorobiphenyl)	9273
PCB-151 (2,2',3,5,5',6-Hexachlorobiphenyl)	9035
PCB-153 (2,2',4,4',5,5'-Hexachlorobiphenyl)	9040
PCB-154 (2,2',4,4',5,6'-Hexachlorobiphenyl)	9174
PCB-155 (2,2',4,4',6,6'-Hexachlorobiphenyl)	9176
PCB-156 (2,3,3',4,4',5-Hexachlorobiphenyl)	9050
PCB-157 (2,3,3',4,4',5'-Hexachlorobiphenyl)	9045
PCB-158 (2,3,3',4,4',6-Hexachlorobiphenyl)	9193
PCB-16 (2,2',3-Trichlorobiphenyl)	9173
PCB-163 (2,3,3',4',5,6-Hexachlorobiphenyl)	9199
PCB-164 (2,3,3',4',5',6-Hexachlorobiphenyl)	9201
PCB-166 (2,3,4,4',5,6-Hexachlorobiphenyl)	9217
PCB-167 (2,3',4,4',5,5'-Hexachlorobiphenyl)	9055
PCB-169 (3,3',4,4',5,5'-Hexachlorobiphenyl)	9060
PCB-17 (2,2',4-Trichlorobiphenyl)	9185
PCB-170 (2,2',3,3',4,4',5-Heptachlorobiphenyl)	9065
PCB-171 (2,2',3,3',4,4',6-Heptachlorobiphenyl)	9106
PCB-172 (2,2',3,3',4,5,5'-Heptachlorobiphenyl)	9110
PCB-173 (2,2',3,3',4,5,6-Heptachlorobiphenyl)	9113
PCB-174 (2,2',3,3',4,5,6'-Heptachlorobiphenyl)	9116
PCB-175 (2,2',3,3',4,5',6-Heptachlorobiphenyl)	9115
PCB-176 (2,2',3,3',4,6,6'-Heptachlorobiphenyl)	9119
PCB-177 (2,2',3,3',4,5',6'-Heptachlorobiphenyl)	9114

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	Code
Organic	
EPA 8270E MOD (Battelle SOP 5-315) by Gas Chromatography Mass Spectrometry (GC/MS)	10242543
Aqueous	
PCB-178 (2,2',3,3',5,5',6-Heptachlorobiphenyl)	9124
PCB-179 (2,2',3,3',5,6,6'-Heptachlorobiphenyl)	9126
PCB-18 (2,2',5-Trichlorobiphenyl)	8930
PCB-180 (2,2',3,4,4',5,5'-Heptachlorobiphenyl)	9134
PCB-183 (2,2',3,4,4',5',6-Heptachlorobiphenyl)	9075
PCB-184 (2,2',3,4,4',6,6'-Heptachlorobiphenyl)	9139
PCB-185 (2,2',3,4,5,5',6-Heptachlorobiphenyl)	9143
PCB-187 (2,2',3,4',5,5',6-Heptachlorobiphenyl)	9080
PCB-188 (2,2',3,4',5,6,6'-Heptachlorobiphenyl)	9146
PCB-189 (2,3,3',4,4',5,5'-Heptachlorobiphenyl)	9085
PCB-19 (2,2',6-Trichlorobiphenyl)	9188
PCB-190 (2,3,3',4,4',5,6-Heptachlorobiphenyl)	9191
PCB-191 (2,3,3',4,4',5',6-Heptachlorobiphenyl)	9192
PCB-193 (2,3,3',4',5,5',6-Heptachlorobiphenyl)	9195
PCB-194 (2,2',3,3',4,4',5,5'-Octachlorobiphenyl)	9090
PCB-195 (2,2',3,3',4,4',5,6-Octachlorobiphenyl)	9103
PCB-197 (2,2',3,3',4,4',6,6'-Octachlorobiphenyl)	9104
PCB-198 (2,2',3,3',4,5,5',6-Octachlorobiphenyl)	9109
PCB-199 (2,2',3,3',4,5,5',6'-Octachlorobiphenyl)	9108
PCB-200 (2,2',3,3',4,5,6,6'-Octachlorobiphenyl)	9111
PCB-201 (2,2',3,3',4,5',6,6'-Octachlorobiphenyl)	9112
PCB-202 (2,2',3,3',5,5',6,6'-Octachlorobiphenyl)	9123
PCB-203 (2,2',3,4,4',5,5',6-Octachlorobiphenyl)	9133
PCB-205 (2,3,3',4,4',5,5',6-Octachlorobiphenyl)	9190
PCB-206 (2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl)	9095
PCB-207 (2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl)	9101
PCB-208 (2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl)	9107
PCB-209 (2,2',3,3',4,4',5,5',6,6'-Decachlorobiphenyl)	9105
PCB-22 (2,3,4'-Trichlorobiphenyl)	9241
PCB-24 (2,3,6-Trichlorobiphenyl)	9247
PCB-25 (2,3',4-Trichlorobiphenyl)	9240
PCB-26 (2,3',5-Trichlorobiphenyl)	8935
PCB-27 (2,3',6-Trichlorobiphenyl)	9248
PCB-28 (2,4,4'-Trichlorobiphenyl)	9252
PCB-29 (2,4,5-Trichlorobiphenyl)	9253
PCB-3 (4-Chlorobiphenyl, 4-Monochlorobiphenyl)	9274

Battelle
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	Code
Organic	
EPA 8270E MOD (Battelle SOP 5-315) by Gas Chromatography Mass Spectrometry (GC/MS)	10242543
Aqueous	
PCB-30 (2,4,6-Trichlorobiphenyl)	9254
PCB-31 (2,4',5-Trichlorobiphenyl)	8940
PCB-32 (2,4',6-Trichlorobiphenyl)	9255
PCB-33 (2,3',4'-Trichlorobiphenyl)	9239
PCB-37 (3,4,4'-Trichlorobiphenyl)	9266
PCB-4 (2,2'-Dichlorobiphenyl)	9189
PCB-40 (2,2',3,3'-Tetrachlorobiphenyl)	9132
PCB-41 (2,2',3,4-Tetrachlorobiphenyl)	9163
PCB-42 (2,2',3,4'-Tetrachlorobiphenyl)	9162
PCB-43 (2,2',3,5-Tetrachlorobiphenyl)	9169
PCB-44 (2,2',3,5'-Tetrachlorobiphenyl)	8945
PCB-45 (2,2',3,6-Tetrachlorobiphenyl)	9172
PCB-46 (2,2',3,6'-Tetrachlorobiphenyl)	9171
PCB-47 (2,2',4,4'-Tetrachlorobiphenyl)	9178
PCB-48 (2,2',4,5-Tetrachlorobiphenyl)	9181
PCB-49 (2,2',4,5'-Tetrachlorobiphenyl)	8950
PCB-5 (2,3-Dichlorobiphenyl)	8920
PCB-50 (2,2',4,6-Tetrachlorobiphenyl)	9184
PCB-51 (2,2',4,6'-Tetrachlorobiphenyl)	9183
PCB-52 (2,2',5,5'-Tetrachlorobiphenyl)	8955
PCB-53 (2,2',5,6'-Tetrachlorobiphenyl)	9186
PCB-54 (2,2',6,6'-Tetrachlorobiphenyl)	9187
PCB-56 (2,3,3',4'-Tetrachlorobiphenyl)	9207
PCB-6 (2,3'-Dichlorobiphenyl)	9249
PCB-60 (2,3,4,4'-Tetrachlorobiphenyl)	9221
PCB-63 (2,3,4',5-Tetrachlorobiphenyl)	9233
PCB-64 (2,3,4',6-Tetrachlorobiphenyl)	9236
PCB-66 (2,3',4,4'-Tetrachlorobiphenyl)	8960
PCB-67 (2,3',4,5-Tetrachlorobiphenyl)	9232
PCB-7 (2,4-Dichlorobiphenyl)	9257
PCB-70 (2,3',4',5-Tetrachlorobiphenyl)	9230
PCB-71 (2,3',4',6-Tetrachlorobiphenyl)	9237
PCB-74 (2,4,4',5-Tetrachlorobiphenyl)	9250
PCB-75 (2,4,4',6-Tetrachlorobiphenyl)	9251
PCB-77 (3,3',4,4'-Tetrachlorobiphenyl)	8965
PCB-8 (2,4'-Dichlorobiphenyl)	9256

Certificate of Accreditation: Supplement

Battelle
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Contact Name: Jonathan Thorn Phone: 781-681-5565

Accreditation is granted to the facility to perform the following testing:

	Code
Organic	
EPA 8270E MOD (Battelle SOP 5-315) by Gas Chromatography Mass Spectrometry (GC/MS)	10242543
Aqueous	
PCB-80 (3,3',5,5'-Tetrachlorobiphenyl)	9264
PCB-81 (3,4,4',5-Tetrachlorobiphenyl)	8970
PCB-82 (2,2',3,3',4-Pentachlorobiphenyl)	9122
PCB-83 (2,2',3,3',5-Pentachlorobiphenyl)	9129
PCB-84 (2,2',3,3',6-Pentachlorobiphenyl)	9131
PCB-85 (2,2',3,4,4'-Pentachlorobiphenyl)	9142
PCB-87 (2,2',3,4,5'-Pentachlorobiphenyl)	8975
PCB-9 (2,5-Dichlorobiphenyl)	9258
PCB-91 (2,2',3,4',6-Pentachlorobiphenyl)	9160
PCB-92 (2,2',3,5,5'-Pentachlorobiphenyl)	9164
PCB-95 (2,2',3,5',6-Pentachlorobiphenyl)	9166
PCB-97 (2,2',3,4',5'-Pentachlorobiphenyl)	9154
PCB-99 (2,2',4,4',5-Pentachlorobiphenyl)	9175
Solid	
2,4'-DDD	8580
2,4'-DDE	8585
2,4'-DDT	8590
4,4'-DDD	7355
4,4'-DDE	7360
4,4'-DDT	7365
Biphenyl	5640
PCB-1 (2-Chlorobiphenyl, 2-Monochlorobiphenyl)	8915
PCB-100 (2,2',4,4',6-Pentachlorobiphenyl)	9177
PCB-101 (2,2',4,5,5'-Pentachlorobiphenyl)	8980
PCB-104 (2,2',4,6,6'-Pentachlorobiphenyl)	9182
PCB-105 (2,3,3',4,4'-Pentachlorobiphenyl)	8985
PCB-11 (3,3'-Dichlorobiphenyl)	8925
PCB-110 (2,3,3',4',6-Pentachlorobiphenyl)	8990
PCB-114 (2,3,4,4',5-Pentachlorobiphenyl)	9005
PCB-115 (2,3,4,4',6-Pentachlorobiphenyl)	9219
PCB-118 (2,3',4,4',5-Pentachlorobiphenyl)	8995
PCB-12 (3,4-Dichlorobiphenyl)	9270
PCB-123 (2,3',4,4',5'-Pentachlorobiphenyl)	9000
PCB-124 (2,3',4',5,5'-Pentachlorobiphenyl)	9222
PCB-125 (2,3',4',5',6-Pentachlorobiphenyl)	9224
PCB-126 (3,3',4,4',5-Pentachlorobiphenyl)	9015

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Organic	
EPA 8270E MOD (Battelle SOP 5-315) by Gas Chromatography Mass Spectrometry (GC/MS)	10242543
Solid	
PCB-127 (3,3',4,5,5'-Pentachlorobiphenyl)	9260
PCB-128 (2,2',3,3',4,4'-Hexachlorobiphenyl)	9020
PCB-13 (3,4'-Dichlorobiphenyl)	9269
PCB-130 (2,2',3,3',4,5'-Hexachlorobiphenyl)	9117
PCB-131 (2,2',3,3',4,6-Hexachlorobiphenyl)	9121
PCB-134 (2,2',3,3',5,6-Hexachlorobiphenyl)	9128
PCB-135 (2,2',3,3',5,6'-Hexachlorobiphenyl)	9127
PCB-136 (2,2',3,3',6,6'-Hexachlorobiphenyl)	9130
PCB-137 (2,2',3,4,4',5-Hexachlorobiphenyl)	9138
PCB-138 (2,2',3,4,4',5'-Hexachlorobiphenyl)	9025
PCB-139 (2,2',3,4,4',6-Hexachlorobiphenyl)	9141
PCB-140 (2,2',3,4,4',6'-Hexachlorobiphenyl)	9140
PCB-141 (2,2',3,4,5,5'-Hexachlorobiphenyl)	9030
PCB-144 (2,2',3,4,5',6-Hexachlorobiphenyl)	9150
PCB-146 (2,2',3,4',5,5'-Hexachlorobiphenyl)	9144
PCB-149 (2,2',3,4',5',6-Hexachlorobiphenyl)	9151
PCB-15 (4,4'-Dichlorobiphenyl)	9273
PCB-151 (2,2',3,5,5',6-Hexachlorobiphenyl)	9035
PCB-153 (2,2’,4,4’,5,5’-Hexachlorobiphenyl)	9040
PCB-154 (2,2',4,4',5,6'-Hexachlorobiphenyl)	9174
PCB-155 (2,2',4,4',6,6'-Hexachlorobiphenyl)	9176
PCB-156 (2,3,3',4,4',5-Hexachlorobiphenyl)	9050
PCB-157 (2,3,3’,4,4’,5’-Hexachlorobiphenyl)	9045
PCB-158 (2,3,3',4,4',6-Hexachlorobiphenyl)	9193
PCB-16 (2,2',3-Trichlorobiphenyl)	9173
PCB-163 (2,3,3',4',5,6-Hexachlorobiphenyl)	9199
PCB-164 (2,3,3',4',5',6-Hexachlorobiphenyl)	9201
PCB-166 (2,3,4,4',5,6-Hexachlorobiphenyl)	9217
PCB-167 (2,3',4,4',5,5'-Hexachlorobiphenyl)	9055
PCB-169 (3,3',4,4',5,5'-Hexachlorobiphenyl)	9060
PCB-17 (2,2',4-Trichlorobiphenyl)	9185
PCB-170 (2,2',3,3',4,4',5-Heptachlorobiphenyl)	9065
PCB-171 (2,2',3,3',4,4',6-Heptachlorobiphenyl)	9106
PCB-172 (2,2',3,3',4,5,5'-Heptachlorobiphenyl)	9110
PCB-173 (2,2',3,3',4,5,6-Heptachlorobiphenyl)	9113
PCB-174 (2,2',3,3',4,5,6'-Heptachlorobiphenyl)	9116

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Organic	
EPA 8270E MOD (Battelle SOP 5-315) by Gas Chromatography Mass Spectrometry (GC/MS)	10242543
Solid	
PCB-175 (2,2',3,3',4,5',6-Heptachlorobiphenyl)	9115
PCB-176 (2,2',3,3',4,6,6'-Heptachlorobiphenyl)	9119
PCB-177 (2,2',3,3',4,5',6'-Heptachlorobiphenyl)	9114
PCB-178 (2,2',3,3',5,5',6-Heptachlorobiphenyl)	9124
PCB-179 (2,2',3,3',5,6,6'-Heptachlorobiphenyl)	9126
PCB-18 (2,2',5-Trichlorobiphenyl)	8930
PCB-180 (2,2',3,4,4',5,5'-Heptachlorobiphenyl)	9134
PCB-183 (2,2',3,4,4',5',6-Heptachlorobiphenyl)	9075
PCB-184 (2,2',3,4,4',6,6'-Heptachlorobiphenyl)	9139
PCB-185 (2,2',3,4,5,5',6-Heptachlorobiphenyl)	9143
PCB-187 (2,2',3,4',5,5',6-Heptachlorobiphenyl)	9080
PCB-188 (2,2',3,4',5,6,6'-Heptachlorobiphenyl)	9146
PCB-189 (2,3,3',4,4',5,5'-Heptachlorobiphenyl)	9085
PCB-19 (2,2',6-Trichlorobiphenyl)	9188
PCB-190 (2,3,3',4,4',5,6-Heptachlorobiphenyl)	9191
PCB-191 (2,3,3',4,4',5',6-Heptachlorobiphenyl)	9192
PCB-193 (2,3,3',4',5,5',6-Heptachlorobiphenyl)	9195
PCB-194 (2,2',3,3',4,4',5,5'-Octachlorobiphenyl)	9090
PCB-195 (2,2',3,3',4,4',5,6-Octachlorobiphenyl)	9103
PCB-197 (2,2',3,3',4,4',6,6'-Octachlorobiphenyl)	9104
PCB-198 (2,2',3,3',4,5,5',6-Octachlorobiphenyl)	9109
PCB-199 (2,2',3,3',4,5,5',6'-Octachlorobiphenyl)	9108
PCB-200 (2,2',3,3',4,5,6,6'-Octachlorobiphenyl)	9111
PCB-201 (2,2',3,3',4,5',6,6'-Octachlorobiphenyl)	9112
PCB-202 (2,2',3,3',5,5',6,6'-Octachlorobiphenyl)	9123
PCB-203 (2,2',3,4,4',5,5',6-Octachlorobiphenyl)	9133
PCB-205 (2,3,3',4,4',5,5',6-Octachlorobiphenyl)	9190
PCB-206 (2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl)	9095
PCB-207 (2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl)	9101
PCB-208 (2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl)	9107
PCB-209 (2,2',3,3',4,4',5,5',6,6'-Decachlorobiphenyl)	9105
PCB-22 (2,3,4'-Trichlorobiphenyl)	9241
PCB-24 (2,3,6-Trichlorobiphenyl)	9247
PCB-25 (2,3',4-Trichlorobiphenyl)	9240
PCB-26 (2,3',5-Trichlorobiphenyl)	8935
PCB-27 (2,3',6-Trichlorobiphenyl)	9248

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Organic	
EPA 8270E MOD (Battelle SOP 5-315) by Gas Chromatography Mass Spectrometry (GC/MS)	10242543
Solid	
PCB-28 (2,4,4'-Trichlorobiphenyl)	9252
PCB-29 (2,4,5-Trichlorobiphenyl)	9253
PCB-3 (4-Chlorobiphenyl, 4-Monochlorobiphenyl)	9274
PCB-30 (2,4,6-Trichlorobiphenyl)	9254
PCB-31 (2,4',5-Trichlorobiphenyl)	8940
PCB-32 (2,4',6-Trichlorobiphenyl)	9255
PCB-33 (2,3',4'-Trichlorobiphenyl)	9239
PCB-37 (3,4,4'-Trichlorobiphenyl)	9266
PCB-4 (2,2'-Dichlorobiphenyl)	9189
PCB-40 (2,2',3,3'-Tetrachlorobiphenyl)	9132
PCB-41 (2,2',3,4-Tetrachlorobiphenyl)	9163
PCB-42 (2,2',3,4'-Tetrachlorobiphenyl)	9162
PCB-43 (2,2',3,5-Tetrachlorobiphenyl)	9169
PCB-44 (2,2',3,5'-Tetrachlorobiphenyl)	8945
PCB-45 (2,2',3,6-Tetrachlorobiphenyl)	9172
PCB-46 (2,2',3,6'-Tetrachlorobiphenyl)	9171
PCB-47 (2,2',4,4'-Tetrachlorobiphenyl)	9178
PCB-48 (2,2',4,5-Tetrachlorobiphenyl)	9181
PCB-49 (2,2',4,5'-Tetrachlorobiphenyl)	8950
PCB-5 (2,3-Dichlorobiphenyl)	8920
PCB-50 (2,2',4,6-Tetrachlorobiphenyl)	9184
PCB-51 (2,2',4,6'-Tetrachlorobiphenyl)	9183
PCB-52 (2,2',5,5'-Tetrachlorobiphenyl)	8955
PCB-53 (2,2',5,6'-Tetrachlorobiphenyl)	9186
PCB-54 (2,2',6,6'-Tetrachlorobiphenyl)	9187
PCB-56 (2,3,3',4'-Tetrachlorobiphenyl)	9207
PCB-6 (2,3'-Dichlorobiphenyl)	9249
PCB-60 (2,3,4,4'-Tetrachlorobiphenyl)	9221
PCB-63 (2,3,4',5-Tetrachlorobiphenyl)	9233
PCB-64 (2,3,4',6-Tetrachlorobiphenyl)	9236
PCB-66 (2,3',4,4'-Tetrachlorobiphenyl)	8960
PCB-67 (2,3',4,5-Tetrachlorobiphenyl)	9232
PCB-7 (2,4-Dichlorobiphenyl)	9257
PCB-70 (2,3',4',5-Tetrachlorobiphenyl)	9230
PCB-71 (2,3',4',6-Tetrachlorobiphenyl)	9237
PCB-74 (2,4,4',5-Tetrachlorobiphenyl)	9250

Certificate of Accreditation: Supplement

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Organic	
EPA 8270E MOD (Battelle SOP 5-315) by Gas Chromatography Mass Spectrometry (GC/MS)	10242543
Solid	
PCB-75 (2,4,4',6-Tetrachlorobiphenyl)	9251
PCB-77 (3,3',4,4'-Tetrachlorobiphenyl)	8965
PCB-8 (2,4'-Dichlorobiphenyl)	9256
PCB-80 (3,3',5,5'-Tetrachlorobiphenyl)	9264
PCB-81 (3,4,4',5-Tetrachlorobiphenyl)	8970
PCB-82 (2,2',3,3',4-Pentachlorobiphenyl)	9122
PCB-83 (2,2',3,3',5-Pentachlorobiphenyl)	9129
PCB-84 (2,2',3,3',6-Pentachlorobiphenyl)	9131
PCB-85 (2,2',3,4,4'-Pentachlorobiphenyl)	9142
PCB-87 (2,2',3,4,5'-Pentachlorobiphenyl)	8975
PCB-9 (2,5-Dichlorobiphenyl)	9258
PCB-91 (2,2',3,4',6-Pentachlorobiphenyl)	9160
PCB-92 (2,2',3,5,5'-Pentachlorobiphenyl)	9164
PCB-95 (2,2',3,5',6-Pentachlorobiphenyl)	9166
PCB-97 (2,2',3,4',5'-Pentachlorobiphenyl)	9154
PCB-99 (2,2',4,4',5-Pentachlorobiphenyl)	9175
Tissue	
2,4'-DDD	8580
2,4'-DDE	8585
2,4'-DDT	8590
4,4'-DDD	7355
4,4'-DDE	7360
4,4'-DDT	7365
Biphenyl	5640
PCB-1 (2-Chlorobiphenyl, 2-Monochlorobiphenyl)	8915
PCB-100 (2,2',4,4',6-Pentachlorobiphenyl)	9177
PCB-101 (2,2',4,5,5'-Pentachlorobiphenyl)	8980
PCB-104 (2,2',4,6,6'-Pentachlorobiphenyl)	9182
PCB-105 (2,3,3',4,4'-Pentachlorobiphenyl)	8985
PCB-11 (3,3'-Dichlorobiphenyl)	8925
PCB-110 (2,3,3',4',6-Pentachlorobiphenyl)	8990
PCB-114 (2,3,4,4',5-Pentachlorobiphenyl)	9005
PCB-115 (2,3,4,4',6-Pentachlorobiphenyl)	9219
PCB-118 (2,3',4,4',5-Pentachlorobiphenyl)	8995
PCB-12 (3,4-Dichlorobiphenyl)	9270
PCB-123 (2,3',4,4',5'-Pentachlorobiphenyl)	9000

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Organic	
EPA 8270E MOD (Battelle SOP 5-315) by Gas Chromatography Mass Spectrometry (GC/MS)	10242543
Tissue	
PCB-124 (2,3',4',5,5'-Pentachlorobiphenyl)	9222
PCB-125 (2,3',4',5',6-Pentachlorobiphenyl)	9224
PCB-126 (3,3',4,4',5-Pentachlorobiphenyl)	9015
PCB-127 (3,3',4,5,5'-Pentachlorobiphenyl)	9260
PCB-128 (2,2',3,3',4,4'-Hexachlorobiphenyl)	9020
PCB-13 (3,4'-Dichlorobiphenyl)	9269
PCB-130 (2,2',3,3',4,5'-Hexachlorobiphenyl)	9117
PCB-131 (2,2',3,3',4,6-Hexachlorobiphenyl)	9121
PCB-134 (2,2',3,3',5,6-Hexachlorobiphenyl)	9128
PCB-135 (2,2',3,3',5,6'-Hexachlorobiphenyl)	9127
PCB-136 (2,2',3,3',6,6'-Hexachlorobiphenyl)	9130
PCB-137 (2,2',3,4,4',5-Hexachlorobiphenyl)	9138
PCB-138 (2,2',3,4,4',5'-Hexachlorobiphenyl)	9025
PCB-139 (2,2',3,4,4',6-Hexachlorobiphenyl)	9141
PCB-140 (2,2',3,4,4',6'-Hexachlorobiphenyl)	9140
PCB-141 (2,2',3,4,5,5'-Hexachlorobiphenyl)	9030
PCB-144 (2,2',3,4,5',6-Hexachlorobiphenyl)	9150
PCB-146 (2,2',3,4',5,5'-Hexachlorobiphenyl)	9144
PCB-149 (2,2',3,4',5',6-Hexachlorobiphenyl)	9151
PCB-15 (4,4'-Dichlorobiphenyl)	9273
PCB-151 (2,2',3,5,5',6-Hexachlorobiphenyl)	9035
PCB-153 (2,2’,4,4’,5,5’-Hexachlorobiphenyl)	9040
PCB-154 (2,2',4,4',5,6'-Hexachlorobiphenyl)	9174
PCB-155 (2,2',4,4',6,6'-Hexachlorobiphenyl)	9176
PCB-156 (2,3,3',4,4',5-Hexachlorobiphenyl)	9050
PCB-157 (2,3,3’,4,4’,5’-Hexachlorobiphenyl)	9045
PCB-158 (2,3,3',4,4',6-Hexachlorobiphenyl)	9193
PCB-16 (2,2',3-Trichlorobiphenyl)	9173
PCB-163 (2,3,3',4',5,6-Hexachlorobiphenyl)	9199
PCB-164 (2,3,3',4',5',6-Hexachlorobiphenyl)	9201
PCB-166 (2,3,4,4',5,6-Hexachlorobiphenyl)	9217
PCB-167 (2,3',4,4',5,5'-Hexachlorobiphenyl)	9055
PCB-169 (3,3',4,4',5,5'-Hexachlorobiphenyl)	9060
PCB-17 (2,2',4-Trichlorobiphenyl)	9185
PCB-170 (2,2',3,3',4,4',5-Heptachlorobiphenyl)	9065
PCB-171 (2,2',3,3',4,4',6-Heptachlorobiphenyl)	9106

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	Code
Organic	
EPA 8270E MOD (Battelle SOP 5-315) by Gas Chromatography Mass Spectrometry (GC/MS)	10242543
Tissue	
PCB-172 (2,2',3,3',4,5,5'-Heptachlorobiphenyl)	9110
PCB-173 (2,2',3,3',4,5,6-Heptachlorobiphenyl)	9113
PCB-174 (2,2',3,3',4,5,6'-Heptachlorobiphenyl)	9116
PCB-175 (2,2',3,3',4,5',6-Heptachlorobiphenyl)	9115
PCB-176 (2,2',3,3',4,6,6'-Heptachlorobiphenyl)	9119
PCB-177 (2,2',3,3',4,5',6'-Heptachlorobiphenyl)	9114
PCB-178 (2,2',3,3',5,5',6-Heptachlorobiphenyl)	9124
PCB-179 (2,2',3,3',5,6,6'-Heptachlorobiphenyl)	9126
PCB-18 (2,2',5-Trichlorobiphenyl)	8930
PCB-180 (2,2',3,4,4',5,5'-Heptachlorobiphenyl)	9134
PCB-183 (2,2',3,4,4',5',6-Heptachlorobiphenyl)	9075
PCB-184 (2,2',3,4,4',6,6'-Heptachlorobiphenyl)	9139
PCB-185 (2,2',3,4,5,5',6-Heptachlorobiphenyl)	9143
PCB-187 (2,2',3,4',5,5',6-Heptachlorobiphenyl)	9080
PCB-188 (2,2',3,4',5,6,6'-Heptachlorobiphenyl)	9146
PCB-189 (2,3,3',4,4',5,5'-Heptachlorobiphenyl)	9085
PCB-19 (2,2',6-Trichlorobiphenyl)	9188
PCB-190 (2,3,3',4,4',5,6-Heptachlorobiphenyl)	9191
PCB-191 (2,3,3',4,4',5',6-Heptachlorobiphenyl)	9192
PCB-193 (2,3,3',4',5,5',6-Heptachlorobiphenyl)	9195
PCB-194 (2,2',3,3',4,4',5,5'-Octachlorobiphenyl)	9090
PCB-195 (2,2',3,3',4,4',5,6-Octachlorobiphenyl)	9103
PCB-197 (2,2',3,3',4,4',6,6'-Octachlorobiphenyl)	9104
PCB-198 (2,2',3,3',4,5,5',6-Octachlorobiphenyl)	9109
PCB-199 (2,2',3,3',4,5,5',6'-Octachlorobiphenyl)	9108
PCB-200 (2,2',3,3',4,5,6,6'-Octachlorobiphenyl)	9111
PCB-201 (2,2',3,3',4,5',6,6'-Octachlorobiphenyl)	9112
PCB-202 (2,2',3,3',5,5',6,6'-Octachlorobiphenyl)	9123
PCB-203 (2,2',3,4,4',5,5',6-Octachlorobiphenyl)	9133
PCB-205 (2,3,3',4,4',5,5',6-Octachlorobiphenyl)	9190
PCB-206 (2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl)	9095
PCB-207 (2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl)	9101
PCB-208 (2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl)	9107
PCB-209 (2,2',3,3',4,4',5,5',6,6'-Decachlorobiphenyl)	9105
PCB-22 (2,3,4'-Trichlorobiphenyl)	9241
PCB-24 (2,3,6-Trichlorobiphenyl)	9247

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	Code
Organic	
EPA 8270E MOD (Battelle SOP 5-315) by Gas Chromatography Mass Spectrometry (GC/MS)	10242543
Tissue	
PCB-25 (2,3',4-Trichlorobiphenyl)	9240
PCB-26 (2,3',5-Trichlorobiphenyl)	8935
PCB-27 (2,3',6-Trichlorobiphenyl)	9248
PCB-28 (2,4,4'-Trichlorobiphenyl)	9252
PCB-29 (2,4,5-Trichlorobiphenyl)	9253
PCB-3 (4-Chlorobiphenyl, 4-Monochlorobiphenyl)	9274
PCB-30 (2,4,6-Trichlorobiphenyl)	9254
PCB-31 (2,4',5-Trichlorobiphenyl)	8940
PCB-32 (2,4',6-Trichlorobiphenyl)	9255
PCB-33 (2,3',4'-Trichlorobiphenyl)	9239
PCB-37 (3,4,4'-Trichlorobiphenyl)	9266
PCB-4 (2,2'-Dichlorobiphenyl)	9189
PCB-40 (2,2',3,3'-Tetrachlorobiphenyl)	9132
PCB-41 (2,2',3,4-Tetrachlorobiphenyl)	9163
PCB-42 (2,2',3,4'-Tetrachlorobiphenyl)	9162
PCB-43 (2,2',3,5-Tetrachlorobiphenyl)	9169
PCB-44 (2,2',3,5'-Tetrachlorobiphenyl)	8945
PCB-45 (2,2',3,6-Tetrachlorobiphenyl)	9172
PCB-46 (2,2',3,6'-Tetrachlorobiphenyl)	9171
PCB-47 (2,2',4,4'-Tetrachlorobiphenyl)	9178
PCB-48 (2,2',4,5-Tetrachlorobiphenyl)	9181
PCB-49 (2,2',4,5'-Tetrachlorobiphenyl)	8950
PCB-5 (2,3-Dichlorobiphenyl)	8920
PCB-50 (2,2',4,6-Tetrachlorobiphenyl)	9184
PCB-51 (2,2',4,6'-Tetrachlorobiphenyl)	9183
PCB-52 (2,2',5,5'-Tetrachlorobiphenyl)	8955
PCB-53 (2,2',5,6'-Tetrachlorobiphenyl)	9186
PCB-54 (2,2',6,6'-Tetrachlorobiphenyl)	9187
PCB-56 (2,3,3',4'-Tetrachlorobiphenyl)	9207
PCB-6 (2,3'-Dichlorobiphenyl)	9249
PCB-60 (2,3,4,4'-Tetrachlorobiphenyl)	9221
PCB-63 (2,3,4',5-Tetrachlorobiphenyl)	9233
PCB-64 (2,3,4',6-Tetrachlorobiphenyl)	9236
PCB-66 (2,3',4,4'-Tetrachlorobiphenyl)	8960
PCB-67 (2,3',4,5-Tetrachlorobiphenyl)	9232
PCB-7 (2,4-Dichlorobiphenyl)	9257

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	Code
Organic	
EPA 8270E MOD (Battelle SOP 5-315) by Gas Chromatography Mass Spectrometry (GC/MS)	10242543
Tissue	
PCB-70 (2,3',4',5-Tetrachlorobiphenyl)	9230
PCB-71 (2,3',4',6-Tetrachlorobiphenyl)	9237
PCB-74 (2,4,4',5-Tetrachlorobiphenyl)	9250
PCB-75 (2,4,4',6-Tetrachlorobiphenyl)	9251
PCB-77 (3,3',4,4'-Tetrachlorobiphenyl)	8965
PCB-8 (2,4'-Dichlorobiphenyl)	9256
PCB-80 (3,3',5,5'-Tetrachlorobiphenyl)	9264
PCB-81 (3,4,4',5-Tetrachlorobiphenyl)	8970
PCB-82 (2,2',3,3',4-Pentachlorobiphenyl)	9122
PCB-83 (2,2',3,3',5-Pentachlorobiphenyl)	9129
PCB-84 (2,2',3,3',6-Pentachlorobiphenyl)	9131
PCB-85 (2,2',3,4,4'-Pentachlorobiphenyl)	9142
PCB-87 (2,2',3,4,5'-Pentachlorobiphenyl)	8975
PCB-9 (2,5-Dichlorobiphenyl)	9258
PCB-91 (2,2',3,4',6-Pentachlorobiphenyl)	9160
PCB-92 (2,2',3,5,5'-Pentachlorobiphenyl)	9164
PCB-95 (2,2',3,5',6-Pentachlorobiphenyl)	9166
PCB-97 (2,2',3,4',5'-Pentachlorobiphenyl)	9154
PCB-99 (2,2',4,4',5-Pentachlorobiphenyl)	9175
PFAS by LC/MS/MS Compliant with Table B-15 of QSM 5.3 or Latest Version by Liquid Chromatography Tandem Mass Spectrometry (LC/MS/MS)	90000451
Aqueous	
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	9490
1H, 1H, 2H, 2H-Perfluorodecane Sulfonic Acid (8:2 FTS)	6948
1H, 1H, 2H, 2H-Perfluorododecane Sulfonic Acid (10:2 FTS)	9616
1H, 1H, 2H, 2H-Perfluorohexane Sulfonic Acid (4:2 FTS)	6946
1H, 1H, 2H, 2H-Perfluorooctane Sulfonic Acid (6:2 FTS)	6947
2H,2H,3H,3H-Perfluorodecanoic Acid (7:3 FTCA, 3-Perfluoroheptyl Propanoic Acid)	9340
2H,2H,3H,3H-Perfluorooctanoic Acid (5:3 FTCA)	9338
4,4,5,5,6,6,6-Heptafluorohexanoi Acid (3:3 FTCA, 3-Perfluoropropyl Propanoic Acid)	9353
9-Chlorohexadecafluoro-3-Oxanonane-1-Sulfonic Acid (9-Cl-PF3ONS)	6952
Ammonium 4,8-Dioxa-3H-Perfluorononanoate (ADONA)	6953
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA) – GenX	9460
N-Ethyl Perfluorooctanesulfonamide (NEtFOSA)	9395
N-Ethyl Perfluorooctanesulfonamidoethanol (NEtFOSE)	9431
N-Ethylperfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	4846

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	Code
Organic	
PFAS by LC/MS/MS Compliant with Table B-15 of QSM 5.3 or Latest Version by Liquid Chromatography Tandem Mass Spectrometry (LC/MS/MS)	90000451
Aqueous	
N-Methylperfluorooctanesulfonamide (NMeFOSA)	6954
N-Methylperfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	4847
N-Methylperfluorooctanesulfonamidoethanol (MeFOSE)	6949
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	6956
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	6957
Perfluoro-1-Octanesulfonamide (PFOSA)	9665
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	6965
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	6966
Perfluorobutanesulfonic Acid (PFBS)	6918
Perfluorobutanoic Acid (PFBA)	6915
Perfluorodecanesulfonic Acid (PFDS)	6920
Perfluorodecanoic Acid (PFDA)	6905
Perfluorododecanesulfonic Acid (PFDoS)	6923
Perfluorododecanoic Acid (PFDoA)	6903
Perfluoroheptanesulfonic Acid (PFHpS)	9470
Perfluoroheptanoic Acid (PFHpA)	6908
Perfluorohexadecanoic Acid (PFHxDA)	6958
Perfluorohexanesulfonic Acid (PFHxS)	6927
Perfluorohexanoic Acid (PFHxA)	6913
Perfluorononanesulfonic Acid (PFNS)	6929
Perfluorononanoic Acid (PFNA)	6906
Perfluorooctadecanoic Acid (PFODA)	6916
Perfluorooctanesulfonic Acid (PFOS)	6931
Perfluorooctanoic Acid (PFOA)	6912
Perfluoropentanesulfonic Acid (PFPeS)	6934
Perfluoropentanoic Acid (PFPeA)	6914
Perfluorotetradecanoic Acid (PFTeDA)	6902
Perfluorotridecanoic Acid (PFTrDA)	9563
Perfluoroundecanoic Acid (PFUnA)	6904
Solid	
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	9490
1H, 1H, 2H, 2H-Perfluorodecane Sulfonic Acid (8:2 FTS)	6948
1H, 1H, 2H, 2H-Perfluorododecane Sulfonic Acid (10:2 FTS)	9616
1H, 1H, 2H, 2H-Perfluorohexane Sulfonic Acid (4:2 FTS)	6946
1H, 1H, 2H, 2H-Perfluorooctane Sulfonic Acid (6:2 FTS)	6947

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	Code
Organic	
PFAS by LC/MS/MS Compliant with Table B-15 of QSM 5.3 or Latest Version by Liquid Chromatography Tandem Mass Spectrometry (LC/MS/MS)	90000451
Solid	
2H,2H,3H,3H-Perfluorodecanoic Acid (7:3 FTCA, 3-Perfluoroheptyl Propanoic Acid)	9340
2H,2H,3H,3H-Perfluorooctanoic Acid (5:3 FTCA)	9338
4,4,5,5,6,6,6-Heptafluorohexanoi Acid (3:3 FTCA, 3-Perfluoropropyl Propanoic Acid)	9353
9-Chlorohexadecafluoro-3-Oxanonane-1-Sulfonic Acid (9-Cl-PF3ONS)	6952
Ammonium 4,8-Dioxa-3H-Perfluorononanoate (ADONA)	6953
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA) – GenX	9460
N-Ethyl Perfluorooctanesulfonamide (NEtFOSA)	9395
N-Ethyl Perfluorooctanesulfonamidoethanol (NEtFOSE)	9431
N-Ethylperfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	4846
N-Methylperfluorooctanesulfonamide (NMeFOSA)	6954
N-Methylperfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	4847
N-Methylperfluorooctanesulfonamidoethanol (MeFOSE)	6949
Nonafluoro-3,6-Dioxaheptanoic Acid (NFDHA)	6956
Perfluoro(2-Ethoxyethane)Sulfonic Acid (PFEESA)	6957
Perfluoro-1-Octanesulfonamide (PFOSA)	9665
Perfluoro-3-Methoxypropanoic Acid (PFMPA)	6965
Perfluoro-4-Methoxybutanoic Acid (PFMBA)	6966
Perfluorobutanesulfonic Acid (PFBS)	6918
Perfluorobutanoic Acid (PFBA)	6915
Perfluorodecanesulfonic Acid (PFDS)	6920
Perfluorodecanoic Acid (PFDA)	6905
Perfluorododecanesulfonic Acid (PFDoS)	6923
Perfluorododecanoic Acid (PFDoA)	6903
Perfluoroheptanesulfonic Acid (PFHpS)	9470
Perfluoroheptanoic Acid (PFHpA)	6908
Perfluorohexadecanoic Acid (PFHxDA)	6958
Perfluorohexanesulfonic Acid (PFHxS)	6927
Perfluorohexanoic Acid (PFHxA)	6913
Perfluorononanesulfonic Acid (PFNS)	6929
Perfluorononanoic Acid (PFNA)	6906
Perfluorooctadecanoic Acid (PFODA)	6916
Perfluorooctanesulfonic Acid (PFOS)	6931
Perfluorooctanoic Acid (PFOA)	6912
Perfluoropentanesulfonic Acid (PFPeS)	6934
Perfluoropentanoic Acid (PFPeA)	6914

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	Code
Organic	
PFAS by LC/MS/MS Compliant with Table B-15 of QSM 5.3 or Latest Version by Liquid Chromatography Tandem Mass Spectrometry (LC/MS/MS)	90000451
Solid	
Perfluorotetradecanoic Acid (PFTeDA)	6902
Perfluorotridecanoic Acid (PFTrDA)	9563
Perfluoroundecanoic Acid (PFUnA)	6904
Tissue	
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid (11Cl-PF3OUdS)	9490
1H, 1H, 2H, 2H-Perfluorodecane Sulfonic Acid (8:2 FTS)	6948
1H, 1H, 2H, 2H-Perfluorohexane Sulfonic Acid (4:2 FTS)	6946
1H, 1H, 2H, 2H-Perfluorooctane Sulfonic Acid (6:2 FTS)	6947
2H,2H,3H,3H-Perfluorodecanoic Acid (7:3 FTCA, 3-Perfluoroheptyl Propanoic Acid)	9340
2H,2H,3H,3H-Perfluorooctanoic Acid (5:3 FTCA)	9338
4,4,5,5,6,6,6-Heptafluorohexanoi Acid (3:3 FTCA, 3-Perfluoropropyl Propanoic Acid)	9353
9-Chlorohexadecafluoro-3-Oxanonane-1-Sulfonic Acid (9-Cl-PF3ONS)	6952
Ammonium 4,8-Dioxa-3H-Perfluorononanoate (ADONA)	6953
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA) – GenX	9460
N-Ethylperfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	4846
N-Methylperfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	4847
Perfluoro-1-Octanesulfonamide (PFOSA)	9665
Perfluorobutanesulfonic Acid (PFBS)	6918
Perfluorobutanoic Acid (PFBA)	6915
Perfluorodecanesulfonic Acid (PFDS)	6920
Perfluorodecanoic Acid (PFDA)	6905
Perfluorododecanoic Acid (PFDoA)	6903
Perfluoroheptanesulfonic Acid (PFHpS)	9470
Perfluoroheptanoic Acid (PFHpA)	6908
Perfluorohexanesulfonic Acid (PFHxS)	6927
Perfluorohexanoic Acid (PFHxA)	6913
Perfluorononanesulfonic Acid (PFNS)	6929
Perfluorononanoic Acid (PFNA)	6906
Perfluorooctanesulfonic Acid (PFOS)	6931
Perfluorooctanoic Acid (PFOA)	6912
Perfluoropentanesulfonic Acid (PFPeS)	6934
Perfluoropentanoic Acid (PFPeA)	6914
Perfluorotetradecanoic Acid (PFTeDA)	6902
Perfluorotridecanoic Acid (PFTrDA)	9563
Perfluoroundecanoic Acid (PFUnA)	6904

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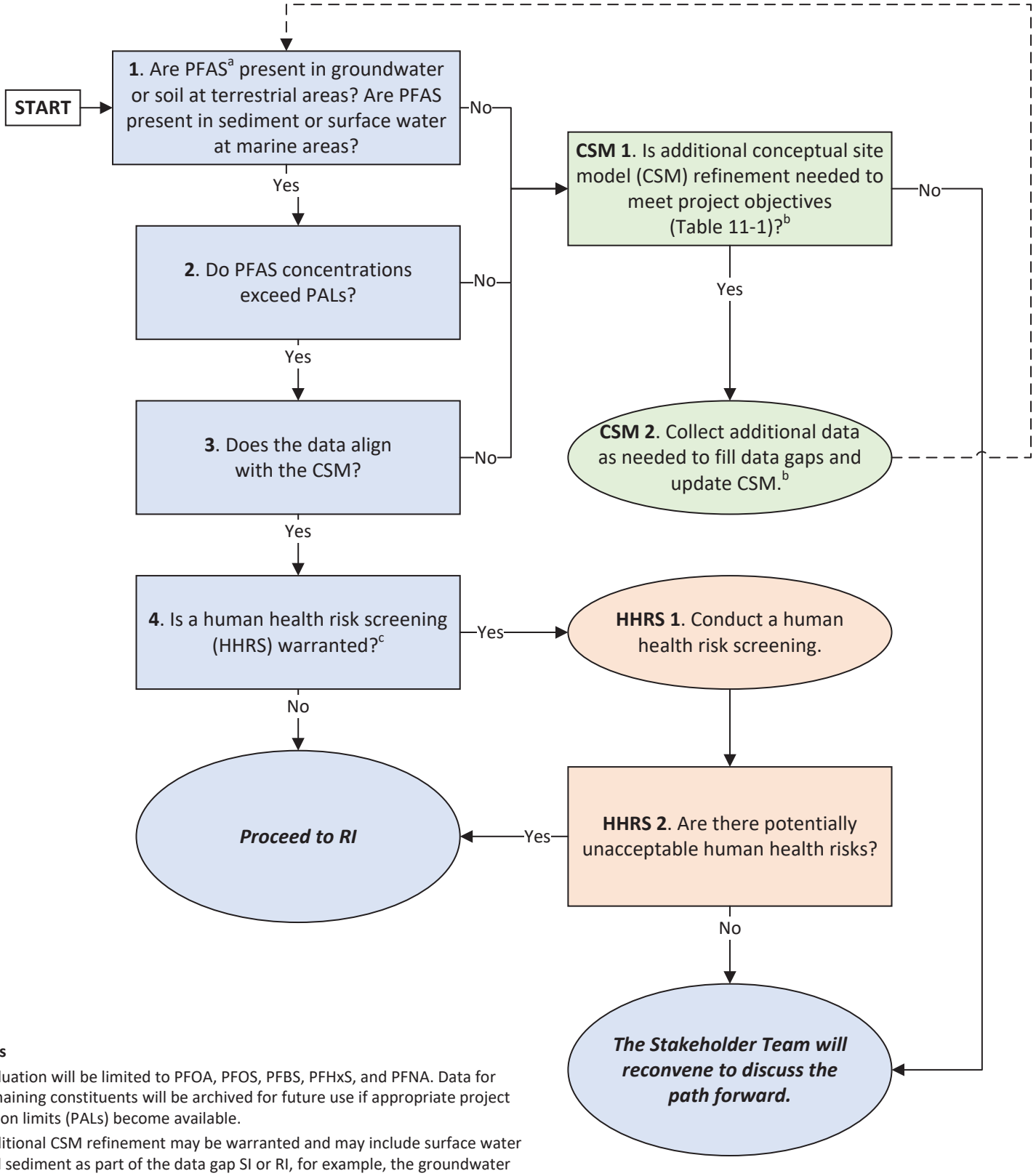
		Code
Preparation		
Aqueous		
EPA 3510C	Separatory Funnel Liquid-Liquid Extraction	
EPA 3640A MOD (Battelle SOP 5-191)	Gel-Permeation Cleanup	
EPA 3660B MOD (Battelle SOP 5-328)	Sulfur Cleanup	
Solid		
EPA 3640A MOD (Battelle SOP 5-191)	Gel-Permeation Cleanup	
EPA 3660B MOD (Battelle SOP 5-328)	Sulfur Cleanup	
NOAA NOS ORCA 71	Orbital Shaker	
Tissue		
EPA 3640A MOD (Battelle SOP 5-191)	Gel-Permeation Cleanup	
EPA 3660B MOD (Battelle SOP 5-328)	Sulfur Cleanup	
NOAA NOS ORCA 71	Orbital Shaker Tissuemizer	

Footnotes:
> Method codes are typically based on The NELAC Institute (TNI) Laboratory Accreditation Management System (LAMS) and are used to compare to the laboratory reported Performance Test (PT) results. Although the method code may not represent the specific method version, it is the method code used to represent the method/technology used to report PTs. (NC = No Code)

Appendix C
Decision Logic Trees



Notes

[a] Evaluation will be limited to PFOA, PFOS, PFBS, PFHxS, and PFNA. Data for remaining constituents will be archived for future use if appropriate project action limits (PALs) become available.

[b] Additional CSM refinement may be warranted and may include surface water and sediment as part of the data gap SI or RI, for example, the groundwater flow direction is significantly different than the inferred direction assumed during SI planning or the measured concentration gradient suggests a potential upgradient source that is not otherwise accounted for, as noted in Table 11-1. A SAP addendum or new SAP will be prepared if the CSM changes and additional media are sampled.

[c] An HHRS is not required and is only performed if useful for site management decisions. The decision to use the HHRS as a site management tool should be made using the most current conceptual site model. The HHRS is most often used as a site management tool when initial results do not point to a straightforward path forward for a site.

Figure 11-1
Site Inspection Decision Logic
Site Inspection for PFAS
Naval Base Kitsap Keyport
Keyport, Washington

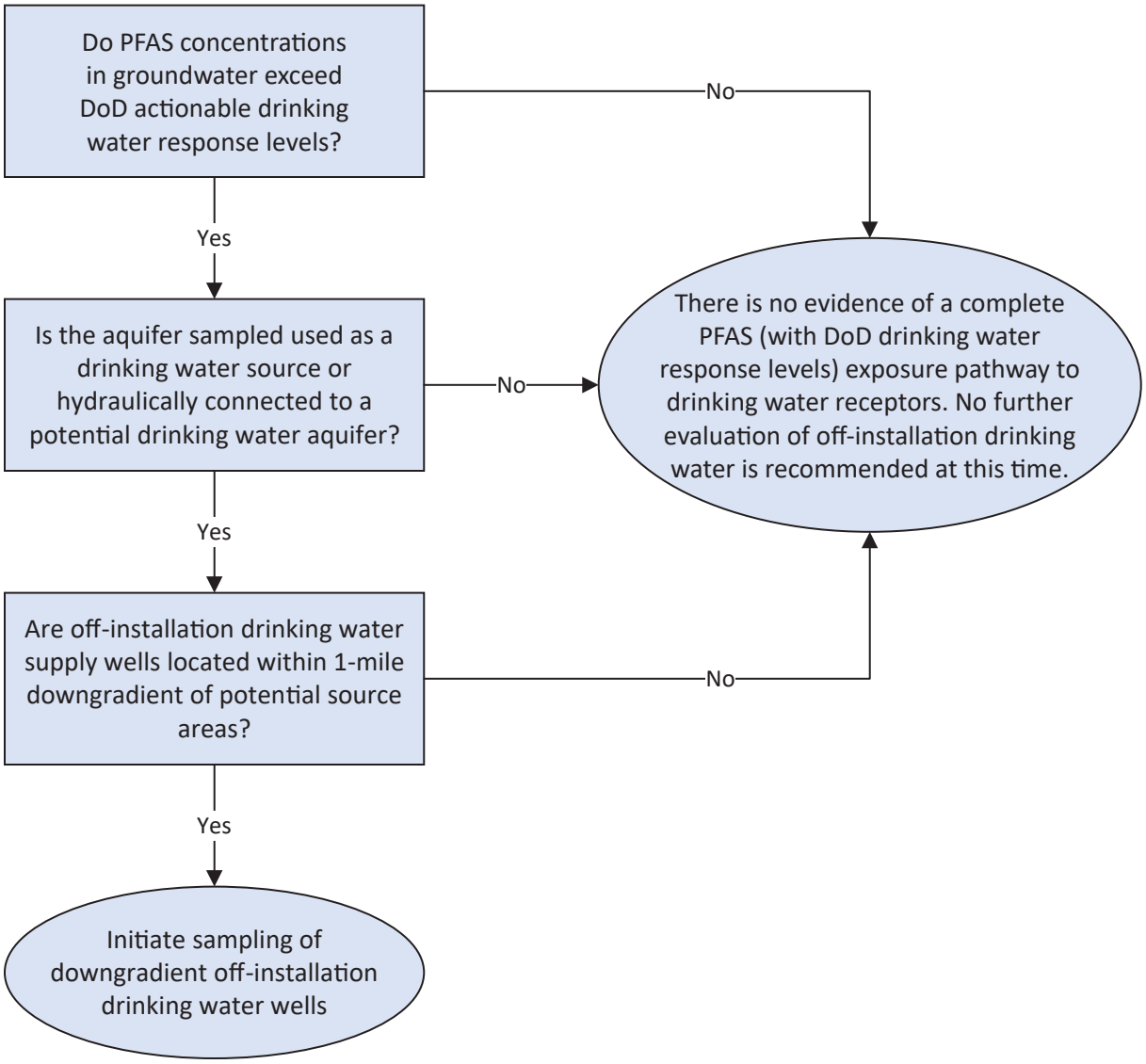


Figure 11-2
Drinking Water Evaluation Decision Logic
Site Inspection for PFAS
Naval Base Kitsap Keyport
Keyport, Washington

Appendix C
Well Construction Details, Soil Boring Logs, and Well Completion Diagrams

Table C-1. Monitoring Well Construction Summary

Site Inspection Report for Per- and Polyfluoroalkyl Substances at Naval Base Kitsap-Keyport

Keyport, Washington

Monitoring Well	Installation Date	Ground Surface Elevation (ft amsl)	Top of PVC Casing Elevation (ft amsl)	Total Well Depth (ft bgs)	Length of Screen (ft)	Depth of Top of Screen (ft bgs)	Depth of Bottom of Screen (ft bgs)	Elevation of Top of Screen (ft amsl)	Elevation of Bottom of Screen (ft amsl)	Northing	Easting	WA state unique well ID
NBKK-B76-MW01	8/31/2022	44.60	44.35	39.0	10.0	29.0	39.0	15.4	5.4	261339.10	1199875.24	BPL-420
NBKK-B76-MW02	9/1/2022	43.45	43.16	59.0	10.0	49.0	59.0	-5.8	-15.8	261247.38	1199872.44	BPL-421
NBKK-B76-MW03	9/2/2022	45.45	45.15	44.0	10.0	34.0	44.0	11.2	1.2	261166.98	1199937.50	BPL-422
NBKK-B76-MW04	9/6/2022	53.11	52.87	69.0	10.0	59.0	69.0	-6.1	-16.1	261258.28	1199993.49	BPL-423
NBKK-B76-MW06	8/8/2023	43.26	42.99	32.0	10.0	22.0	32.0	21.0	11.0	261455.68	1199985.70	BPK-434
NBKK-B76-MW07	8/10/2023	50.15	49.92	33.0	10.0	23.0	33.0	26.9	16.9	261340.96	1199985.89	BPK-437
NBKK-B76-MW08	8/10/2023	54.71	54.37	35.5	10.0	24.5	35.5	29.9	18.9	261337.78	1200075.29	BPK-436
NBKK-B76-MW09	8/9/2023	54.84	54.59	29.0	10.0	19.0	29.0	35.6	25.6	261288.49	1200083.60	BPK-435
NBKK-CF1-MW01	10/13/2022	34.91	34.90	63.0	10.0	53.0	63.0	-18.1	-28.1	261941.09	1200393.18	BPK-462
NBKK-CF1-MW02	11/5/2022	43.12	42.80	65.0	10.0	55.0	65.0	-12.2	-22.2	261803.49	1200331.89	BPK-470
NBKK-CF1-MW03	10/24/2022	36.81	36.50	63.5	10.0	53.5	63.5	-17.0	-27.0	261829.66	1200465.53	BPK-463
NBKK-OU2A5-MW01	10/31/2022	21.70	21.44	60.0	20.0	40.0	60.0	-18.6	-38.6	262157.07	1200526.77	BPK-469
NBKK-OU2A5-MW02	10/29/2022	18.50	18.06	60.0	20.0	40.0	60.0	-21.9	-41.9	262048.66	1200606.00	BPK-468
NBKK-OU2A5-MW03	9/8/2022	26.17	25.68	40.0	20.0	20.0	40.0	5.7	-14.3	261997.87	1200537.19	BPL-424
NBKK-B1006-MW01	10/10/2022	13.82	13.38	14.0	10.0	4.0	14.0	9.4	-0.6	258601.17	1199301.97	BPK-459
NBKK-B1006-MW02	10/11/2022	12.65	12.34	14.0	10.0	4.0	14.0	8.3	-1.7	258531.35	1199373.56	BPK-460
NBKK-B1006-MW03	10/12/2022	18.14	17.87	16.0	10.0	6.0	16.0	11.9	1.9	258378.49	1199277.61	BPK-461
NBKK-B1006-MW04	11/5/2022	15.75	15.22	15.0	10.0	5.0	15.0	10.2	0.2	258348.70	1199351.39	BPK-471
NBKK-OU2A2-MW01[a]	11/5/2022	28.39	28.15	14.0	10.0	4.0	14.0	24.2	14.2	257991.88	1198880.93	BKP-401
NBKK-OU2A2-MW02	11/5/2022	25.42	27.26	14.0	10.0	4.0	14.0	23.3	13.3	258065.55	1199013.51	BPK-472
NBKK-OU2A2-MW03	11/5/2022	23.60	23.18	14.0	10.0	4.0	14.0	19.2	9.2	258060.35	1199068.93	BPK-473
NBKK-OU2A2-MW04	11/9/2022	23.98	23.66	11.0	10.0	7.0	17.0	16.7	6.7	257985.52	1199201.50	BPK-403
NBKK-OU2A2-MW05	11/9/2022	24.90	24.53	17.0	10.0	7.0	17.0	17.5	7.5	257920.78	1199205.13	BPK-402
NBKK-OU2A2-MW06	11/9/2022	20.93	23.21	14.0	10.0	4.0	14.0	19.2	9.2	257939.13	1199359.41	BPK-404
NBKK-S7-MW01	10/28/2022	13.69	13.33	29.0	20.0	9.0	29.0	4.3	-15.7	261189.11	1201288.03	BPK-464
NBKK-S7-MW02	10/27/2022	15.54	15.39	29.0	20.0	9.0	29.0	6.4	-13.6	261188.70	1201697.48	BPK-466
NBKK-S7-MW03[b]	NA											
NBKK-S7-MW04	10/25/2022	16.08	15.88	19.0	10.0	9.0	19.0	6.9	-3.1	260906.72	1201287.80	BPK-467
NBKK-S7-MW05	10/26/2022	15.68	15.31	29.0	20.0	9.0	29.0	6.3	-13.7	260890.16	1201900.37	BPK-465
NBKK-LFEX-MW01	10/6/2022	24.55	24.10	39.0	10.0	29.0	39.0	-4.9	-14.9	260152.47	1199596.28	BPK-457

Table C-1. Monitoring Well Construction Summary

Site Inspection Report for Per- and Polyfluoroalkyl Substances at Naval Base Kitsap-Keyport

Keyport, Washington

Monitoring Well	Installation Date	Ground Surface Elevation (ft amsl)	Top of PVC Casing Elevation (ft amsl)	Total Well Depth (ft bgs)	Length of Screen (ft)	Depth of Top of Screen (ft bgs)	Depth of Bottom of Screen (ft bgs)	Elevation of Top of Screen (ft amsl)	Elevation of Bottom of Screen (ft amsl)	Northing	Easting	WA state unique well ID
NBKK-LFEX-MW02	10/5/2022	21.98	21.60	28.0	10.0	18.0	28.0	3.6	-6.4	259980.32	1199382.73	BPK-456
NBKK-LFEX-MW03	10/5/2022	20.13	19.73	29.5	10.0	19.5	29.5	0.2	-9.8	259906.27	1199545.80	BPK-455
NBKK-LFEX-MW04	10/8/2022	23.27	23.02	33.0	10.0	23.0	33.0	0.0	-10.0	259915.48	1199818.02	BPK-458

[a] Well NBKK-OU2A2-MW01 was determined to have a potential break in well screen during well development. Well repair was completed on March 29, 2023; due to the nature of the repair, resurvey of the well was not required.

[b] Monitoring well NBKK-S7-MW03 was not installed due to access issues and other construction work occurring for the duration of the SI. Removal of this well from the SI scope is described in Field Change Request 1.

amsl = above mean sea level. Vertical elevation references the North American Vertical Datum of 1988 (NAD88)

btoc = below top of casing

ft = feet

ID = identification

NA = not applicable

PVC = polyvinyl chloride

SI = Site Inspection

WA = Washington

JACOBS

PROJECT NUMBER:	BORING NUMBER:	
704758CH.05.06.FI	NBKK-B76-MW01	SHEET 1 OF 2

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 261339.10 ft, E 1199875.24 ft | ELEVATION: 44.60 ft NAVD88

DRILLING CONTRACTOR: Holt Drilling Services Inc. | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 13.52 ft bgs | START: 8/30/22 10:50 | END: 8/31/22 10:00 | LOGGER: I. Dinkelman, J. Peery-Lemon, C. Corio

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
			Air Knifed; soil not logged		PID= 0.0 (ppm)	Monument - Flush mount and concrete
					11:05 Collected NBKK-B76-SS01-0203 on 8/30/22	
5						
	4		**SILTY SAND WITH GRAVEL (SM)** Grayish Brown (10YR 5/2), Wet, Medium Dense, Fine to Medium Grained, Subangular to Subrounded Sand, with Silt, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Little Clay. Roots and organic observed from ~ 6.0-8.0'.		11:08 Air Knife to 6.0'	
			SILTY SAND WITH GRAVEL (SM) Brown (10YR 5/3), Dry, Loose, Medium Dense, Fine to Medium Grained, Subangular Sand, with Silt, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Few Clay.			
10			**SANDY ELASTIC SILT WITH GRAVEL (MH)** Moist, Dense, Very Stiff, Non Plastic to Low Plasticity Silt with Fine to Coarse Grained, Subangular to Subrounded Gravel and Fine to Coarse Grained, Angular to Subangular Sand, Little Clay.		PID= 0.0 (ppm)	
15	8					Seal - Hydrated 3/8 bentonite chips
			SILTY SAND (SM) Light Brownish Gray (2.5Y 6/2), Dry, Medium Dense, Fine to Medium Grained, Subangular Sand with Silt, and Fine to Coarse Grained, Angular to Subrounded Gravel, Trace Clay.			
20						

JACOBS

PROJECT NUMBER:	BORING NUMBER:	
704758CH.05.06.FI	NBKK-B76-MW01	SHEET 2 OF 2

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS

LOCATION: NUWC Division Keyport

COORDINATES: N 261339.10 ft, E 1199875.24 ft

ELEVATION: 44.60 ft NAVD88

DRILLING CONTRACTOR: Holt Drilling Services Inc.

DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 13.52 ft bgs

START: 8/30/22 10:50

END: 8/31/22 10:00

LOGGER: I. Dinkleman, J. Peery-Lemon, C. Corio

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
			SANDY SILT WITH GRAVEL (ML) Gray (5Y 6/1), Moist, Medium Dense to Dense, Stiff to Very Stiff, Low Plasticity Silt with Fine to Coarse Grained, Subangular to Subrounded Sand, and Fine to Coarse Grained, Subangular to Subrounded Gravel. From 26-27 more competent soil layer. Dark Gray (5Y 4/1), More moisture, Moderate cementation.		PID= 0.0 (ppm)	
25	6				13:55 Collected NBKK-B76-SB01-2526	
30			**SILTY SAND WITH GRAVEL (SM)** Dark Olive Gray (5Y 3/2), Wet, Loose, Medium Dense, Fine to Coarse Grained, Angular to Subangular Sand, with Silt, and Fine to Coarse Grained, Subangular to Subrounded Gravel.		PID= 0.0 (ppm)	
			CLAYEY SAND WITH GRAVEL (SC) Dark Gray (2.5Y 4/1), Wet, Dense to Very Dense, Fine to Coarse Grained, Subangular Sand, with Clay, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Little Silt.			
			SILTY SAND WITH GRAVEL (SM) Olive Gray (5Y 4/2), Moist, Dense to Very Dense, Fine to Coarse Grained, Angular to Subangular Sand, with Silt, and Fine Grained, Subangular Gravel, Little Clay.			Filter sand pack - 12/20 washed silica
35	8		**SILTY SAND (SM)** Dark Olive Gray (5Y 3/2), Wet, Loose, Medium Dense, Fine to Coarse Grained, Subangular to Subrounded Sand, with Silt, and Fine to Coarse Grained, Subangular to Subrounded Gravel.			Screen 29-39 ft - 0.020 slot SCH 40 PVC
			WELL-GRADED SAND WITH SILT AND GRAVEL (SW-SM) Very Dark Grayish (2.5Y 3/2), Wet, Loose, Medium Dense, Fine to Coarse Grained, Angular to Subangular Sand, with Silt, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Trace Clay.			
			SILTY SAND WITH GRAVEL (SM) Dark Gray (10YR 4/1), Moist, Medium Dense to Dense, Loose, Fine to Coarse Grained, Angular to Subangular Sand, with Silt, and Fine to Coarse Grained, Subangular to Subrounded Gravel			Backfill: 39-40 ft - 12/20 washed silica
40						

Bottom of Boring at 40.00 ft bgs on 8/31/22 10:00

JACOBS

PROJECT NUMBER:	BORING NUMBER:	
704758CH.05.06.FI	NBKK-B76-MW02	SHEET 1 OF 3

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS

LOCATION: NUWC Division Keyport

COORDINATES: N 261247.38 ft, E 1199872.44 ft

ELEVATION: 43.45 ft NAVD88

DRILLING CONTRACTOR: Holt Drilling Services Inc.

DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 20.2 ft bgs

START: 8/31/22 11:20

END: 9/1/22 10:40

LOGGER: I. Dinkelman, J. Peery-Lemon, C. Corio

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
			Hand Auger and Air Knife; soil not logged			Monument - Flush mount and concrete
5					14:20 Collected NBKK-B76-SS02-0203 on 8/30/22	
	4		**SILTY SAND (SM)** Moist, Dense, Fine Grained, Subangular Sand, with Silt, and Fine Grained, Subangular Gravel, Little Clay.		Hand auger to 3.0 ft bgs, Air knife to 6.0 ft bgs	
10			**SILTY SAND WITH GRAVEL (SM)** Olive Brown (2.5Y 4/3), Wet, Medium Dense, Fine Grained, Subangular Sand, with Silt, and Fine Grained, Angular to Subangular Gravel, Little Clay.			
			SANDY ELASTIC SILT (MH) Light Brownish Gray (2.5Y 6/2), Moist, Very Stiff to Stiff, Non Plastic Silt, with Fine Grained Sand, and Trace Fine Grained, Subangular Gravel, Little Clay.			
15	7		**SILTY SAND (SM)** Light Brownish Gray (10YR 6/2), Moist, Medium Dense to Dense, Fine to Medium Grained, Subangular Sand, with Silt, and Fine to Coarse Grained, Subangular Gravel, Little Clay.			
			SILTY SAND (SM) Grayish Brown (2.5Y 5/2), Moist, Medium Dense to Dense, Fine to Medium Grained, Subangular Sand, with Silt, and Fine Grained, Subangular Gravel, Little Clay.			
20						

JACOBS®

PROJECT NUMBER:	BORING NUMBER:	
704758CH.05.06.FI	NBKK-B76-MW02	SHEET 2 OF 3

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 261247.38 ft, E 1199872.44 ft | ELEVATION: 43.45 ft NAVD88

DRILLING CONTRACTOR: Holt Drilling Services Inc. | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 20.2 ft bgs | START: 8/31/22 11:20 | END: 9/1/22 10:40 | LOGGER: I. Dinkelman, J. Peery-Lemon, C. Corio

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
			SILTY SAND WITH GRAVEL (SM) Dark Gray (5Y 4/1), Moist, Dense, Fine to Medium Grained, Subangular Sand, with Silt, and Fine Grained, Subangular Gravel, Little Clay.			
			SILTY SAND WITH GRAVEL (SM) Gray (2.5Y 6/1), Moist, Dense to Very Dense, Fine to Coarse Grained, Subangular Sand, with Silt, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Little Clay.			
25	8					Seal - Hydrated 3/8 bentonite chips
30			**SILTY SAND (SM)** Dark Gray (2.5Y 4/1), Moist, Dense, Fine to Coarse Grained, Subangular Sand, with Silt, and Fine to Coarse Grained, Subangular Gravel, Little Clay.			
			SILTY SAND WITH GRAVEL (SM) Moist, Dense to Very Dense, Fine to Medium Grained, Subangular Sand, with Silt, and Fine to Coarse Grained, Subangular Gravel, Little Clay.			
35	8					
40						

JACOBS

PROJECT NUMBER:	BORING NUMBER:	
704758CH.05.06.FI	NBKK-B76-MW02	SHEET 3 OF 3

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 261247.38 ft, E 1199872.44 ft | ELEVATION: 43.45 ft NAVD88

DRILLING CONTRACTOR: Holt Drilling Services Inc. | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 20.2 ft bgs | START: 8/31/22 11:20 | END: 9/1/22 10:40 | LOGGER: I. Dinkelman, J. Peery-Lemon, C. Corio

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
45	7.5		**SILTY SAND WITH GRAVEL (SM)** Dark Olive Gray (5Y 3/2), Moist, Dense to Very Dense, Fine to Coarse Grained, Subangular Sand with Silt, and Fine to Coarse Grained, Subangular to Subrounded Gravel up to 4 in diameter, Little Clay.		15:10 NBKK-B76-SB02-4849 on 8/31/22	
50			**SILTY SAND WITH GRAVEL (SM)** Very Dark Gray (2.5Y 3/1), Moist, Dense to Very Dense, Fine to Medium Grained, Subangular Sand, and Silt, with Fine Grained, Angular to Subangular Gravel, Little Clay.			
			SILTY SAND WITH GRAVEL (SM) Moist, Dense to Very Dense, Fine to Coarse Grained, Subangular Sand, with Silt, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Little Clay.			
			ELASTIC SILT (MH) Black (2.5Y 2.5/1), Wet, Stiff, Low to Medium Plasticity Silt with Fine to Medium Grained, Subangular to Subrounded Sand, Little Clay.			Filter sand pack - 12/20 washed silica Screen 49-59 ft - 0.20 slot SCH 40 PVC
55	7		**SILTY SAND (SM)** Very Dark Gray (3/N), Wet, Medium Dense, Medium to Coarse Grained, Subangular Sand, with Silt, and Trace Fine Grained Gravel, Trace Clay.			
			SILTY SAND WITH GRAVEL (SM) Dark Greenish Gray (10Y 2.5/1), Wet Loose, Medium Dense, Fine to Coarse Grained, Subangular Sand, with Silt, and Fine Grained, Subangular Gravel, Little Clay. Small Wood/twig identified in core sample.			
60						Backfill: 59-60 ft - 12/20 washed silica

Bottom of Boring at 60.00 ft bgs on 9/1/22 10:40

JACOBS

PROJECT NUMBER:	BORING NUMBER:	
704758CH.05.06.FI	NBKK-B76-MW03	SHEET 1 OF 3

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS

LOCATION: NUWC Division Keyport

COORDINATES: N 261166.98 ft, E 1199937.50 ft

ELEVATION: 45.45 ft NAVD88

DRILLING CONTRACTOR: Holt Drilling Services Inc

DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 24.85 ft bgs

START: 9/1/22 12:50

END: 9/2/22 10:30

LOGGER: I. Dinkelman, J. Peery-Lemon, C. Corio

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
			Air Knifed; soil not logged			Monument - Flush mount and concrete
					12:35 Collected NBKK-B76-SS03-0203 on 8/30/22	
5						
	2.5		**SILTY SAND (SM)** Greenish Gray (5GY 5/1), Moist, Medium Dense, Fine Grained, Subangular Sand, with Silt, and Fine Grained, Subangular Gravel up to 4" diameter, Little Clay. Clay clasts are fat clay with high plasticity color greenish grey. Some asphalt in core sample.		PID= 0.0 (ppm) 12:09 Wet from 6.0' - 10'. Air knife to 6.0 ft bgs	
10						
	9		**SILTY SAND WITH GRAVEL (SM)** Grayish Brown (2.5Y 5/2), Moist, Medium Dense, Fine to Medium Grained, Subangular Sand with Silt, and Fine to Coarse Grained, Subangular Gravel up to 2.0" diameter, Little Clay. At 16' color change.		PID= 0.0 (ppm)	
15						Seal - Hydrated 3/8 bentonite chips
			SILTY SAND WITH GRAVEL (SM) Moist, Medium Dense to Dense, Fine to Coarse Grained, Subangular to Subrounded Sand, with Silt, and Fine to Coarse Grained, Angular to Subangular Gravel, Little Clay. At 23.75'-24.25' a wet zone of well graded sand with silt and gravel with few clay clasts color 2.5Y 3/1 very dark grey. Generally loose to, medium dense consistency.			
20						

JACOBS

PROJECT NUMBER:	BORING NUMBER:	
704758CH.05.06.FI	NBKK-B76-MW03	SHEET 2 OF 3

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 261166.98 ft, E 1199937.50 ft | ELEVATION: 45.45 ft NAVD88

DRILLING CONTRACTOR: Holt Drilling Services Inc | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 24.85 ft bgs | START: 9/1/22 12:50 | END: 9/2/22 10:30 | LOGGER: I. Dinkelman, J. Peery-Lemon, C. Corio

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
25					PID= 0.0 (ppm)	
30			**SILTY SAND WITH GRAVEL (SM)** Dark Gray (5Y 4/1) Moist, Medium Dense to Dense, Fine to Coarse Grained, Subangular Sand, with Silt, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Little Clay.		PID= 0.0 (ppm) 13:10 Collected NBKK-B76-SB03-3334 on 9/1/22	
35	7		**SILTY SAND WITH GRAVEL (SM)** Moist, Medium Dense to Dense, Fine to Coarse Grained, Subangular Sand, with Silt, and Fine to Coarse Grained, Angular to Subangular Gravel up to 4.0" diameter, Little Clay. **WELL-GRADED SAND WITH SILT AND GRAVEL (SW-SM)** Dark Greenish Gray (10Y 3/1), Wet, Loose, Medium Dense, Fine to Coarse Grained, Angular to Subangular Sand with Silt and Fine to Coarse Grained, Subangular to Subrounded, Little Clay. **SANDY LEAN CLAY WITH GRAVEL (CL)** Gray (5Y 5/1), Moist, Dense, Stiff Consistency, Medium Plasticity Clay with Fine to Medium Grained, Angular to Subangular Sand, and Fine Grained, Subangular Gravel, Trace Silt. NO RECOVERY			Filter sand pack - 12/20 washed silica Screen 34-44 ft - 0.020 slot SCH 40 PVC
40						

JACOBS®

PROJECT NUMBER:	BORING NUMBER:	
704758CH.05.06.FI	NBKK-B76-MW03	SHEET 3 OF 3

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 261166.98 ft, E 1199937.50 ft | ELEVATION: 45.45 ft NAVD88

DRILLING CONTRACTOR: Holt Drilling Services Inc | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 24.85 ft bgs | START: 9/1/22 12:50 | END: 9/2/22 10:30 | LOGGER: I. Dinkelman, J. Peery-Lemon, C. Corio

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
	3.5		**SILTY SAND WITH GRAVEL (SM)** Dark Olive Gray (5Y 3/2), Wet, Medium Dense to Dense, Fine to Coarse Grained, Angular to Subangular Sand with Silt, and Fine to Coarse Grained, Angular to Subangular Gravel, Little Clay.		PID= 0.0 (ppm)	
45			Bottom of Boring at 45.00 ft bgs on 9/2/22 10:30			Backfill: 44-45 ft - 12/20 washed silica
50						
55						
60						

JACOBS®

PROJECT NUMBER:	BORING NUMBER:	
704758CH.05.06.FI	NBKK-B76-MW04	SHEET 1 OF 4

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 261258.28 ft, E 1199993.49 ft | ELEVATION: 53.11 ft NAVD88

DRILLING CONTRACTOR: Holt Drilling Servies Inc. | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 28.25 ft bgs | START: 9/6/22 09:10 | END: 9/6/22 14:05 | LOGGER: I. Dinkelman, C. Dronfield, J. Peery-Lemon

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
			Hand Augered and Air Knifed; soil not logged		10:00 Collected NBKK-B76-SS04-0102 on 8/31/22	Monument - Flush mount and concrete
5						
			SILTY SAND (SM) Yellowish Brown (10YR 5/6), Moist, Medium Dense, Loose, Fine to Medium Grained, Subangular Sand with Some Silt, and Trace Fine to Coarse Grained Subangular to Subrounded Gravel, Little Clay.		PID= 0.0 (ppm) Hand auger to 3.0 ft bgs, Air knife to 6.0 ft bgs	
			SILTY SAND WITH GRAVEL (SM) Moist, Loose, Fine to Coarse Grained, Angular to Subangular Sand with Some Silt, and Fine to Coarse Grained Subangular to Subrounded Gravel, Little Clay.			
10					PID= 0.0 (ppm) 9:09 Please pull photo from lithology section	
			SANDY SILT WITH GRAVEL (ML) Moist, Very Stiff, Slow Dilatancy, Low Plasticity Silt with Some Fine to Coarse Grained, Subangular Sand, and Fine to Coarse Grained Subrounded Gravel, Little Clay.			
15	8.5					
20						

JACOBS®

PROJECT NUMBER:	BORING NUMBER:	
704758CH.05.06.FI	NBKK-B76-MW04	SHEET 2 OF 4

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 261258.28 ft, E 1199993.49 ft | ELEVATION: 53.11 ft NAVD88

DRILLING CONTRACTOR: Holt Drilling Servies Inc. | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 28.25 ft bgs | START: 9/6/22 09:10 | END: 9/6/22 14:05 | LOGGER: I. Dinkelman, C. Dronfield, J. Peery-Lemon

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
			SILTY SAND WITH GRAVEL (SM) Dark Gray (5Y 4/1), Moist, Dense to Medium Dense, Fine to Coarse Grained, Subangular to Subrounded Sand with Some Silt, and Fine to Coarse Grained Subangular to Subrounded Gravel, Little Clay.		PID= 0.0 (ppm)	
25	8		**ELASTIC SILT WITH GRAVEL (MH)** Gray (5Y 5/1), Moist, Very Stiff, Hard, Medium Plasticity Silt, with Fine to Coarse Grained, Subangular Gravel, and Fine to Coarse Grained Angular to Subangular Sand, Little Clay. Few sandy stringers.			Seal - Hydrated 3/8 bentonite chips
30			**SILTY SAND WITH GRAVEL (SM)** Greenish Gray (10Y 5/1), Wet, Medium Dense, Fine to Coarse Grained, Subangular Sand with Silt and Fine to Coarse Grained Subangular to Subrounded Gravel, Little Clay.		PID= 0.0 (ppm) 10:09 Trace cobble up to 4.0" diameter	
			SANDY LEAN CLAY WITH GRAVEL (CL) Gray (2.5Y 6/1), Moist, Dense, Very Stiff, Low to Medium Plasticity Clay with Fine to Coarse Grained, Subangular Sand, and Fine to Coarse Grained Subangular to Subrounded Gravel up to 3.0" diameter, Few Silt.			
35	7					
40						

JACOBS

PROJECT NUMBER:	BORING NUMBER:	
704758CH.05.06.FI	NBKK-B76-MW04	SHEET 3 OF 4

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 261258.28 ft, E 1199993.49 ft | ELEVATION: 53.11 ft NAVD88

DRILLING CONTRACTOR: Holt Drilling Servies Inc. | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 28.25 ft bgs | START: 9/6/22 09:10 | END: 9/6/22 14:05 | LOGGER: I. Dinkelman, C. Dronfield, J. Peery-Lemon

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
			SILTY SAND WITH GRAVEL (SM) Grayish Brown (2.5Y 5/2), Moist, Medium Dense to Dense, Fine to Coarse Grained, Angular to Subangular Sand, with Silt, and Fine to Coarse Grained Subangular to Subrounded Gravel, Little Clay.		PID= 0.0 (ppm) 10:09 May have small WBZ from 40-42.5 but likely slow recharge. Continue to 60'	
			SILTY SAND WITH GRAVEL (SM) Olive Gray (5Y 4/2), Wet, Medium Dense to Dense, Fine to Medium Grained, Subangular Sand with Silt, and Fine to Coarse Grained Subangular to Subrounded Gravel, Trace Clay.			
			CLAYEY SAND WITH GRAVEL (SC) Moist, Dense, Fine to Coarse Grained, Subangular Sand, with Clay, and Fine to Coarse Grained Subangular to Subrounded Gravel, Trace Silt.			
45	6.5					
50					PID= 0.0 (ppm)	
			WELL-GRADED SAND WITH SILT AND GRAVEL (SW-SM) Dark Greenish Black (10Y 4/1), Wet, Loose, Medium Dense, Fine to Coarse Grained, Angular to Subangular Sand, with Silt, and Fine to Coarse Grained Subangular to Subrounded Gravel, Little Clay.			
			CLAYEY SAND WITH GRAVEL (SC) Gray (5Y 6/1), Moist, Very Dense, Very Stiff, Fine to Medium Grained, Subangular Sand, with Clay, and Fine to Coarse Grained Subangular to Subrounded Gravel up to 3.0 in Diameter, Few Silt.			
55	7				11:40 Collected NBKK-B76-SB04-5859 on 9/6/22	
60						

JACOBS®

PROJECT NUMBER:	BORING NUMBER:	
704758CH.05.06.FI	NBKK-B76-MW04	SHEET 4 OF 4

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 261258.28 ft, E 1199993.49 ft | ELEVATION: 53.11 ft NAVD88

DRILLING CONTRACTOR: Holt Drilling Servies Inc. | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 28.25 ft bgs | START: 9/6/22 09:10 | END: 9/6/22 14:05 | LOGGER: I. Dinkelman, C. Dronfield, J. Peery-Lemon

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
			FAT CLAY WITH GRAVEL (CH) Dark Gray (5Y 4/1), Moist, Dense to Very Dense, Very Stiff, Hard Consistency, Medium to High Plasticity Clay with Fine to Coarse Grained, Subangular to Subrounded Gravel, and Fine to Medium Grained, Subangular Sand, Little Silt.		PID= 0.0 (ppm)	
			WELL GRADED SAND WITH SILT (SW-SM) Black (2.5/N), Wet, Loose, Fine to Coarse Grained, Subangular Sand with Silt, and Trace Fine to Coarse Grained, Subangular to Subrounded Gravel, Little Clay.			Filter sand pack - 12/20 washed silica
65	9		**CLAYEY SAND WITH GRAVEL (SC)** Very Dark Gray (3/N), Wet, Medium Dense to Dense, Fine to Coarse Grained, Angular to Subangular, Sand with Clay, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Trace Silt.			Screen 59-69 ft - 0.020 slot SCH 40 PVC
			POORLY GRADED SAND WITH SILT (SP-SM) Wet, Loose, Soft, Medium Grained, Subangular Sand, with Silt, and Trace Fine Grained, Subangular to Subrounded Gravel.			
70						Backfill: 69-70 ft - 12/20 washed silica
			Bottom of Boring at 70.00 ft bgs on 9/6/22 14:05			
75						
80						

JACOBS®

PROJECT NUMBER:	BORING NUMBER:	
704758CH.05.06.FI	NBKK-B76-MW06	SHEET 1 OF 3

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 261455.68 ft, E 1199985.70 ft | ELEVATION: 43.26 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket Drilling | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 11.6 ft bgs | START: 8/7/2023 | END: 8/8/2023 | LOGGER: L. Kleppin

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
			SANDY SILT (ML) Air Knife to 5 feet bgs.		PID= 0.0 (ppm)	Monument - Flush mount and concrete
5						
	4		**SILT WITH GRAVEL AND SAND (ML)** Greyish Brown (2.5Y 5/2), Moist, Stiff, Subrounded to Well rounded, Fine to Coarse Grained Gravel, Fine Sand		PID= 0.1 (ppm)	
10					PID= 0.0 (ppm)	Seal - 3/4" Hole-Plug
	10					
15					PID= 0.0 (ppm)	
20						

JACOBS®

PROJECT NUMBER:	BORING NUMBER:	
704758CH.05.06.FI	NBKK-B76-MW06	SHEET 2 OF 3

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 261455.68 ft, E 1199985.70 ft | ELEVATION: 43.26 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket Drilling | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 11.6 ft bgs | START: 8/7/2023 | END: 8/8/2023 | LOGGER: L. Kleppin

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
					PID= 0.0 (ppm)	
	10		**POORLY GRADED SAND (SP)** Grey (GLEY1 4/10Y), Wet, Loose, Medium Grained, No Odor			
25					PID= 2.6 (ppm) No Odor	
			SANDY SILT (ML) Grey (GLEY1 4/10Y), Moist, Very Stiff to Hard, with Moist, Subrounded to Well rounded, Fine to Coarse Grained Gravel			Filter sand pack - 12/20 washed silica Screen 22-32 ft -0.20 slot SCH 40 PVC
30					PID= 0.0 (ppm)	
	10					
35					PID= 0.0 (ppm)	
			WELL GRADED SAND (SW) Grey (GLEY1 4/10Y), Wet, Loose, Fine to Coarse Grained, with Silt			
40						

JACOBS®

PROJECT NUMBER:	BORING NUMBER:	
704758CH.05.06.FI	NBKK-B76-MW06	SHEET 3 OF 3

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 261455.68 ft, E 1199985.70 ft | ELEVATION: 43.26 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket Drilling | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 11.6 ft bgs | START: 8/7/2023 | END: 8/8/2023 | LOGGER: L. Kleppin

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
45	10		**SILTY SAND (SM)** Grey (GLEY1 4/10Y), Moist, Very Dense, Very Fine Sand, with Subrounded, Fine to Coarse Grained Gravel, and Silt		PID= 0.0 (ppm)	Backfill: 32-50 ft - 12/20 washed silica
50			**SILT WITH GRAVEL AND SAND (ML)** Grey (GLEY1 4/10Y), Moist to Dry, Very Stiff, Subrounded to Well rounded, Fine to Coarse Grained Gravel		PID= 0.0 (ppm)	
			Bottom of Boring at 50.00 ft bgs on 8/8/2023			
55						
60						

JACOBS®

PROJECT NUMBER:	BORING NUMBER:	
704758CH.05.06.FI	NBKK-B76-MW07	SHEET 1 OF 2

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 261340.96 ft, E 1199985.89 ft | ELEVATION: 50.15 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket Drilling | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 14.5 ft bgs | START: 8/10/2023 | END: 8/10/2023 | LOGGER: L. Kleppin

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
			SANDY SILT/ POORLY GRADED SAND (ML/SP) Air Knife to 5 feet bgs		PID= 0.0 (ppm)	Monument - Flush mount and concrete
5			**POORLY GRADED SAND (SP)** Brown, Moist, Fine Grained		PID= 0.0 (ppm)	
	4		**SANDY SILT WITH GRAVEL (ML)** Brown, Moist, Very Stiff Silt, with Fine Grained Sand, and Well Rounded, Fine Grained Gravel			
10					PID= 0.0 (ppm)	Seal - 3/4" Hole Plug
	10					
15					PID= 0.0 (ppm)	
			SILTY SAND WITH GRAVEL (ML) Greyish Brown, Wet, Loose, Fine to Medium Grained Sand			
20			**SANDY SILT (ML)** Grey, Moist, Hard, Silt, with Fine Grained Sand, and Well Rounded, Fine Grained Gravel			

JACOBS

PROJECT NUMBER:	BORING NUMBER:	
704758CH.05.06.FI	NBKK-B76-MW07	SHEET 2 OF 2

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS
LOCATION: NUWC Division Keyport

COORDINATES: N 261340.96 ft, E 1199985.89 ft
ELEVATION: 50.15 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket Drilling
DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 14.5 ft bgs
START: 8/10/2023
END: 8/10/2023
LOGGER: L. Kleppin

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
					PID= 0.1 (ppm)	
	10		**SILTY SAND (SM)** Brown, Wet, Loose, Fine to Medium Grained Sand			
25					PID= 1.2 (ppm)	
			SANDY SILT WITH GRAVEL (ML) Brown, Moist, Very Stiff Silt, with Subrounded to Well rounded, Fine Grained Gravel			Filter sand pack - 12/20 washed silica Screen 23-33 ft -0.20 slot SCH 40 PVC
			SILTY SAND (SM) Grey, Wet, Loose, Fine to Medium Grained Sand, with Gravel			
30					PID= 0.1 (ppm)	
	10		**SANDY SILT (ML)** Grey, Moist, Hard, with Gravel			
35			**SILTY SAND (SM)** Brown, Wet, Loose		PID= 0.0 (ppm)	Backfill: 33-40 ft - 12/20 washed silica
40						

Bottom of Boring at 40.00 ft bgs on 8/10/2023

JACOBS

PROJECT NUMBER:	BORING NUMBER:	
704758CH.05.06.FI	NBKK-B76-MW08	SHEET 1 OF 2

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 261337.78 ft, E 1200075.29 ft | ELEVATION: 54.71 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket Drilling | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 16 ft bgs | START: 8/9/2023 | END: 8/9/2023 | LOGGER: L. Kleppin

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
			SANDY SILT (ML) Air knife to 5 feet bgs		PID= 0.0 (ppm)	Monument - Flush mount and concrete
5	5		**SANDY SILT WITH GRAVEL (ML)** Greyish Brown (2.5Y 4/2), Moist, Stiff Silt, with Fine Grained Sand, and Subrounded to Well rounded, Fine to Coarse Grained Gravel		PID= 0.0 (ppm)	
10			**SILT WITH GRAVEL (ML)** Greyish Brown (2.5Y 4/2), Moist, Very Stiff		PID= 0.0 (ppm)	Seal - 3/4" Hole Plug
			SILTY SAND WITH GRAVEL (SM) Moist, Fine Grained Sand			
15	9		**SANDY SILT WITH GRAVEL (ML)** Greyish Brown (2.5Y 4/2), Moist, Very Stiff, Fine Grained Sand		PID= 0.0(ppm) Sample: MW08-1516 collected from 15-16 ft bgs	
20			**SANDY SILT WITH GRAVEL (ML)** Greyish Brown, Moist, Hard			

JACOBS®

PROJECT NUMBER:	BORING NUMBER:	
704758CH.05.06.FI	NBKK-B76-MW08	SHEET 2 OF 2

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS
LOCATION: NUWC Division Keyport
COORDINATES: N 261337.78 ft, E 1200075.29 ft
ELEVATION: 54.71 ft NAVD88
DRILLING CONTRACTOR: Yellow Jacket Drilling
DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel
WATER LEVEL: 16 ft bgs
START: 8/9/2023
END: 8/9/2023
LOGGER: L. Kleppin

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
					PID= 0.1 (ppm)	
			SANDY SILT (ML) Grey (GLEY1 5/10Y), Dry, Hard Silt, with Fine Grained Sand			
			SANDY SILT WITH GRAVEL (ML) Greyish Brown, Moist, Hard			
	10					
25					PID= 1.2 (ppm)	
			WELL GRADED SAND (SW) Wet, Loose, Fine to Coarse Grained Sand			Filter sand pack - 12/20 washed silica
			SANDY SILT WITH GRAVEL (ML) Grey (GLEY1 4/10Y), Dry, Stiff, Trace Clay		Free water on core barrel from 29-40 ft bgs	Screen 24.5-34.5 ft - 0.20 slot SCH 40 PVC
30					PID= 0.1 (ppm)	
			SILTY SAND (SM) Greyish Brown (2.5Y 4/1), Wet, Medium Dense, Medium Grained Sand, with Subangular to Well rounded, Fine to Coarse Grained Gravel			
	10					
35					PID= 0.0 (ppm)	Backfill: 34.5-40 ft - 12/20 washed silica
40						

Bottom of Boring at 40.00 ft bgs on 8/9/2023

JACOBS®

PROJECT NUMBER:	BORING NUMBER:	
704758CH.05.06.FI	NBKK-B76-MW09	SHEET 1 OF 2

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 261288.49 ft, E 1200083.60 ft | ELEVATION: 54.84 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket Drilling | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 16 ft bgs | START: 8/9/2023 | END: 8/9/2023 | LOGGER: L. Kleppin

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
			SILTY SAND (SM) Air Knife to 5 feet bgs.		PID= 0.0 (ppm) Sample: MW09-0001 collected from 0-1 ft bgs	Monument - Flush mount and concrete
5	4		**SILTY SAND WITH GRAVEL (SM)** Greyish Brown (2.5Y 4/2), Moist, Dense, Fine Grained Sand, with Subrounded to Well Rounded, Fine to Corase Grained Gravel		PID= 0.0 (ppm)	
10	10		**SILTY SAND WITH GRAVEL (SM)** Greyish Brown (2.5Y 4/2), Wet, Medium Dense, Fine to Medium Grained Sand, with Subrounded, to Well Rounded, Fine to Coarse Grained Gravel		PID= 0.0 (ppm) PID= 0.0 (ppm) Sample: MW09-1415 collected from 14-15 ft bgs	Seal - 3/4" Hole Plug
15						
20			**SANDY SILT WITH GRAVEL (ML)** Greyish Brown, Moist, Very Stiff			

JACOBS

PROJECT NUMBER:	BORING NUMBER:	
704758CH.05.06.FI	NBKK-B76-MW09	SHEET 2 OF 2

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 261288.49 ft, E 1200083.60 ft | ELEVATION: 54.84 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket Drilling | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 16 ft bgs | START: 8/9/2023 | END: 8/9/2023 | LOGGER: L. Kleppin

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
					PID= 0.1 (ppm) Sample: MW09-1920 collected from 19-20 ft bgs	
			SILTY SAND WITH GRAVEL (SM) Greyish Brown, Wet, Very Dense, Fine to Medium Grained Sand, with Subangular to Well Rounded, Fine Grained Gravel			Filter sand pack - 12/20 washed silica
	10					Screen 19-29 ft -0.20 slot SCH 40 PVC
25					PID= 1.2 (ppm)	
			SANDY SILT (ML) Grey (GLEY1 4/N), Dry, Hard			
			WELL GRADED SAND (SW) Loose, Wet			
			SILTY SAND (SM) Grey, Moist, Dense, Fine to Medium Grained Sand			
30					PID= 0.1 (ppm)	
			SANDY SILT WITH GRAVEL (ML) Moist, Very Stiff			
			SILT WITH GRAVEL (ML) Grey, Moist, Very Still, Trace Clay			
	10					Backfill: 29-39 ft - 12/20 washed silica
35					PID= 0.0 (ppm)	
			SANDY SILT WITH GRAVEL (ML) Moist, Very Stiff to Hard, Fine Grained Sand			
			SILTY SAND (SM) Grey, Wet, Dense			
			Bottom of Boring at 39.00 ft bgs on 8/9/2023			
40						

JACOBS®

PROJECT NUMBER:	BORING NUMBER:	
704758CH.05.06.FI	NBKK-B76-SB05	SHEET 1 OF 1

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 261219.54 ft, E 1199915.98 ft | ELEVATION: NA

DRILLING CONTRACTOR: Yellow Jacket | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: | START: 10/1/22 19:00 | END: | LOGGER: I. Dinkelman

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
5	6		**CLAYEY SAND WITH GRAVEL (SC)** Brown (10YR 4/3), Moist, Medium Dense, Sand with Fine to Coarse Grained, Subangular Gravel, and Trace Clay.		14:35 Collected NBKK-B76-SB05-0304	
			Bottom of Boring at 6.00 ft bgs on			
10						
15						
20						

JACOBS®

PROJECT NUMBER:	BORING NUMBER:	
704758CH.05.06.FI	NBKK-CF1-MW01	SHEET 1 OF 4

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 261941.09 ft, E 1200393.18 ft | ELEVATION: 34.91 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 33.6 ft bgs | START: 10/13/22 09:35 | END: 10/14/22 09:30 | LOGGER: I. Dinkelman, T. Ta

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
5	9.25		**CLAYEY SAND (SC)** Olive Brown (2.5Y 4/3), Moist, Medium Dense to Dense, Fine to Coarse Grained, Angular to Subangular Sand, with Clay, and Fine to Coarse Grained, Angular to Subangular Gravel, Few Silt. Top 1.0' is a silty sand with gravel and little clay (SM). Loose. Retrieved during Hand auger for utility clearance. Few organic such as roots and small wood traces. Clayey sand from 1.0-10.0' has trace cobbles up to 4" diameter.		PID= 0.0 (ppm) Hand auger to 3.0 ft bgs, Air knife to 6.0 ft bgs Collected NBKK-CF1-SS01-0001 on 10/8/22	Monument - Flush mount and concrete
10						
15	9.5		**CLAYEY SAND WITH GRAVEL (SC)** Dark Gray (2.5Y 4/1), Moist, Medium Dense to Dense, Fine to Medium Grained, Angular to Subangular Sand, with Clay, and Fine to Coarse Grained, Angular to Subangular Gravel, Few Silt. At ~12.0' large cobble up to 5" in length. Color change to Dark Gray (2.5Y 4/1) from ~ 16.0-17'.			
20						

JACOBS

PROJECT NUMBER:	BORING NUMBER:	
704758CH.05.06.FI	NBKK-CF1-MW01	SHEET 2 OF 4

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 261941.09 ft, E 1200393.18 ft | ELEVATION: 34.91 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 33.6 ft bgs | START: 10/13/22 09:35 | END: 10/14/22 09:30 | LOGGER: I. Dinkelman, T. Ta

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
25	9		**CLAYEY SAND WITH GRAVEL (SC)** Dark Grayish Brown (2.5Y 4/2), Moist, Medium Dense to Dense, Fine to Coarse Grained, Subangular Sand, with Clay, and Fine to Coarse Grained, Subangular Gravel, Few Silt.			Cement Grout
30			**CLAYEY SAND WITH GRAVEL (SC)** Dark Gray (10YR 4/1), Moist, Dense, Fine to Coarse Grained, Angular to Subangular, Sand with Clay, and Fine to Coarse Grained, Subangular Gravel, Little Silt.			
35	8		**CLAYEY SAND WITH GRAVEL (SC)** Moist, Dense, Fine to Coarse Grained, Angular to Subangular Sand, with Clay, and Fine to Coarse Grained, Subangular Gravel, Few Silt.			
40						

JACOBS®

PROJECT NUMBER:	BORING NUMBER:	
704758CH.05.06.FI	NBKK-CF1-MW01	SHEET 3 OF 4

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 261941.09 ft, E 1200393.18 ft | ELEVATION: 34.91 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 33.6 ft bgs | START: 10/13/22 09:35 | END: 10/14/22 09:30 | LOGGER: I. Dinkelman, T. Ta

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
			CLAYEY SAND WITH GRAVEL (SC) Dark Grayish Brown (2.5Y 4/2), Moist, Dense, Fine to Coarse Grained, Angular to Subangular Sand with Clay, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Trace Silt.			
			SILTY SAND (SM) Brown (10YR 5/3), Moist, Medium Dense to Dense, Fine to Medium Grained, Subangular Sand, with Silt, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Little Clay.			
45	9					
50					15:15 Collected NBKK-CF1-SB01-5152 from 51'-52'	Seal - Hydrated 3/8 bentonite chips
			CLAYEY SAND WITH GRAVEL (SC) Dark Greenish Black (10Y 4/1), Moist, Medium Dense to Dense, Medium to Coarse Grained, Angular to Subangular Sand, with Clay, and Fine Grained, Subangular Gravel, Trace Silt.			
55	9					
			SILTY SAND WITH GRAVEL (SM) Dark Greenish Black (5GY 4/1), Wet, Medium Dense, Fine to Coarse Grained, Subangular Sand, with Silt, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Little Clay. Trace cobbles up to 3.5" diameter.			Filter sand pack - 12/20 washed silica Screen 53-63 ft - 0.020 slot SCH 40 PVC
60						

JACOBS®

PROJECT NUMBER:	BORING NUMBER:	
704758CH.05.06.FI	NBKK-CF1-MW01	SHEET 4 OF 4

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 261941.09 ft, E 1200393.18 ft | ELEVATION: 34.91 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 33.6 ft bgs | START: 10/13/22 09:35 | END: 10/14/22 09:30 | LOGGER: I. Dinkelman, T. Ta

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
			SILTY SAND (SM) Dark Gray (2.5Y 4/1), Moist, Dense, Stiff, Fine to Medium Grained, Angular to Subangular, Sand, with Silt, and Fine to Coarse Grained, Subangular Gravel, Trace Clay.			
			SILTY SAND WITH GRAVEL (SM) Gray (2.5Y 5/1), Moist, Medium Dense to Dense, Fine to Coarse Grained, Subangular Sand, with Silt, and Fine to Coarse Grained, Subangular to Subrounded, Trace Clay.			
	8					
65			**CLAYEY SAND WITH GRAVEL (SC)** Fine to Coarse Grained, Angular to Subangular Sand, with Clay, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Trace Silt.			Backfill: 63-68 ft - 12/20 washed silica
			Bottom of Boring at 68.00 ft bgs on 10/14/22 09:30			
70						
75						
80						

JACOBS

PROJECT NUMBER:	BORING NUMBER:	
704758CH.05.06.FI	NBKK-CF1-MW02	SHEET 1 OF 4

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 261803.49 ft, E 1200331.89 ft | ELEVATION: 43.12 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 39.1 ft bgs | START: 11/2/22 08:45 | END: 11/3/22 10:15 | LOGGER: I. Dinkelman, J. Peery-Lemon

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
			Hand Augered; soil not logged		PID= 0.0 (ppm) 16:20 Collected NBKK-CF1-SS02-1H2H on 10/7/22	Monument - Flush mount and concrete
			SILTY SAND WITH GRAVEL (SM) Dark Yellowish Brown (10YR 4/4), Moist, Loose, Fine to Coarse Grained, Angular to Subangular Sand, with Silt, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Little Clay.		8:11 Previously Hand auger/Air knife to 5.5’	
5	7.5		**SILTY SAND WITH GRAVEL (SM)** Grayish Brown (2.5Y 5/2), Moist, Medium Dense to Dense, Fine to Medium Grained, Angular to Subangular Sand, with Silt, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Trace Clay. Trace cobble up to 4.0” diameter.			
10			**CLAYEY SAND WITH GRAVEL (SC)** Moist, Dense to Very Dense, Fine to Coarse Grained, Angular to Subangular Sand, with Clay, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Trace Silt.			
15	10					
20						

JACOBS®

PROJECT NUMBER:	BORING NUMBER:	
704758CH.05.06.FI	NBKK-CF1-MW02	SHEET 2 OF 4

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 261803.49 ft, E 1200331.89 ft | ELEVATION: 43.12 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 39.1 ft bgs | START: 11/2/22 08:45 | END: 11/3/22 10:15 | LOGGER: I. Dinkelman, J. Peery-Lemon

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
			SILTY SAND WITH GRAVEL (SM) Grayish Brown (2.5Y 5/2), Moist, Medium Dense, Loose, Fine to Medium Grained, Subangular Sand, with Silt, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Little Clay. Few well cemented clasts that are dense.			
			CLAYEY SAND WITH GRAVEL (SC) Dark Grayish Brown (2.5Y 4/2), Moist, Dense, Fine to Coarse Grained, Subangular Sand, with Clay, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Few Silt.			
			SILTY SAND WITH GRAVEL (SM) Light Brownish Gray (2.5Y 6/2), Dry, Medium Dense to Dense, Fine to Coarse Grained Sand, with Silt, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Little Clay. Some sands are strongly cemented.			
25	9		**CLAYEY SAND WITH GRAVEL (SC)** Grayish Brown (2.5Y 5/2), Moist, Dense to Very Dense, Fine to Coarse Grained, Subangular Sand, with Clay, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Few Silt.			Bentonite Grout
			Rock/Pulverized Rock			
30						
			CLAYEY SAND WITH GRAVEL (SC) Moist, Medium Dense to Dense, Fine to Coarse Grained, Subangular Sand, with Clay, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Few Silt.			
35	9					
			SILTY SAND WITH GRAVEL (SM) Dark Grayish Brown (2.5Y 4/2), Moist, Medium Dense, Fine to Medium Grained, Angular to Subangular Sand, with Silt, and Fine to Coarse Grained, Subangular to Subrounded Gravel. Trace cobble up to 3.5" diameter.		14:00 Collected NBKK-CF1-SB02-3839 on 11/2/22	
40						

JACOBS®

PROJECT NUMBER:	BORING NUMBER:	
704758CH.05.06.FI	NBKK-CF1-MW02	SHEET 3 OF 4

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 261803.49 ft, E 1200331.89 ft | ELEVATION: 43.12 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 39.1 ft bgs | START: 11/2/22 08:45 | END: 11/3/22 10:15 | LOGGER: I. Dinkelman, J. Peery-Lemon

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
45	8		**SILTY SAND WITH GRAVEL (SM)** Dark Gray (2.5Y 4/1), Moist, Medium Dense, Fine to Medium Grained, Angular to Subangular Sand, with Silt, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Little Clay. Trace cobbles up to 4.5" diameter subangular. Sand is generally poorly graded with few coarse subangular grain size.		10:11 Softer material encountered during drilling	
50			**CLAYEY SAND WITH GRAVEL (SC)** Dark Gray (5Y 4/1), Moist, Dense to Very Dense, Fine to Medium Grained, Angular to Subangular Sand, with Clay, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Few Silt.			Seal - Hydrated 3/8 bentonite chips
55	10		**SILTY SAND WITH GRAVEL (SM)** Dark Gray (4/N), Moist, Medium Dense to Dense, Fine to Coarse Grained, Angular to Subangular Sand, with Silt, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Little clay. Sand stringers from 61.5-62.0 and 63-63.5' consisting of a well graded sand with silt GLEY1 N5/1 wet sands likely Water bearing. More cohesive silty sand beds from 59-61 and 68-69'.			Filter sand pack - 12/20 washed silica
60						

JACOBS®

PROJECT NUMBER:	BORING NUMBER:	
704758CH.05.06.FI	NBKK-CF1-MW02	SHEET 4 OF 4

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 261803.49 ft, E 1200331.89 ft | ELEVATION: 43.12 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 39.1 ft bgs | START: 11/2/22 08:45 | END: 11/3/22 10:15 | LOGGER: I. Dinkelman, J. Peery-Lemon

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
65	9					Screen 55-65 ft - 0.020 slot SCH 40 PVC
70						
						Backfill: 65-80 ft - 12/20 washed silica
75	8.5					
80						

Bottom of Boring at 80.00 ft bgs on 11/3/22 10:15

JACOBS

PROJECT NUMBER:	BORING NUMBER:	
704758CH.05.06.FI	NBKK-CF1-MW03	SHEET 1 OF 4

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 261829.66 ft, E 1200465.53 ft | ELEVATION: 36.81 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 22.72 ft bgs | START: 10/14/22 14:20 | END: 10/15/22 12:45 | LOGGER: I. Dinkelman, T. Ta

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
			SILTY SAND WITH GRAVEL (SM) Brown (10YR 5/3), Moist, Loose, Medium Dense, Fine to Coarse Grained, Subangular Sand, with Silt, and Fine to Coarse Grained, Angular to Subangular Gravel. Likely Fill.		PID= 0.0 (ppm) Collected NBKK-CF1-SS03-0102 on 10/8/22	Monument - Flush mount and concrete
5			**SILTY SAND (SM)** Olive Brown (2.5Y 4/3), Moist, Medium Dense to Dense, Fine Grained, Subangular Sand, with Silt and Fine to Coarse Grained, Angular to Subangular, Gravel.		Hand auger to 3.0 ft bgs, Air knife to 6.0 ft bgs	
	6		**SILTY SAND WITH GRAVEL (SM)** Very Dark Grayish (2.5Y 3/2), Medium Dense to Dense, Fine Grained Sand, with Silt, and Fine to Coarse Grained, Subangular Gravel, Little Clay.			
10			**SILTY SAND WITH GRAVEL (SM)** Grayish Brown (2.5Y 5/2), Moist, Medium Dense, Fine to Medium Grained, Angular to Subangular Sand, with Silt, and Fine to Coarse Grained, Subangular Gravel, Little Clay.			
15	9					
20						

JACOBS®

PROJECT NUMBER:	BORING NUMBER:	
704758CH.05.06.FI	NBKK-CF1-MW03	SHEET 2 OF 4

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 261829.66 ft, E 1200465.53 ft | ELEVATION: 36.81 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 22.72 ft bgs | START: 10/14/22 14:20 | END: 10/15/22 12:45 | LOGGER: I. Dinkelman, T. Ta

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
25	9		**SILTY SAND WITH GRAVEL (SM)** Olive Brown (2.5Y 4/3), Moist, Medium Dense to Dense, Fine to Medium Grained, Subangular Sand, with Silt, and Fine to Coarse Grained, Angular to Subangular, Gravel, Little Clay. At ~27.0' a 0.5' lens of very fine poorly graded silty sand, Gray (10YR 5/1).			Bentonite Grout
30						
35	9.5		**SILTY SAND WITH GRAVEL (SM)** Dark Grayish Brown (2.5Y 4/2), Moist, Dense, Fine to Coarse Grained, Subangular Sand, with Silt, and Fine to Coarse Grained, Angular to Subangular Gravel, Little Clay. Trace cobbles up to 3.5" diameter.			
40						

JACOBS

PROJECT NUMBER:	BORING NUMBER:	
704758CH.05.06.FI	NBKK-CF1-MW03	SHEET 3 OF 4

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 261829.66 ft, E 1200465.53 ft | ELEVATION: 36.81 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 22.72 ft bgs | START: 10/14/22 14:20 | END: 10/15/22 12:45 | LOGGER: I. Dinkelman, T. Ta

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
45	10		**CLAYEY SAND WITH GRAVEL (SC)** Dark Gray (2.5Y 4/1), Wet, Dense, Medium Grained, Angular to Subangular Sand, with Clay, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Little Silt.			
50			**CLAYEY SAND WITH GRAVEL (SC)** Dark Gray (4/N), Moist, Dense to Very Dense, Fine to Medium Grained, Angular to Subangular Sand, with Clay, and Fine to Coarse Grained, Subangular Gravel, Little Silt. Moist with wet sand stringers.		10:20 Collected NBKK-CF1-SB03-5253 from 52'-53'.	Seal - Hydrated 3/8 bentonite chips
55	10		**SILTY SAND WITH GRAVEL (SM)** Dark Greenish Black (10Y 4/1), Moist, Medium Dense, Fine to Medium Grained, Angular Sand, with Silt, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Little Clay. **SILTY SAND WITH GRAVEL (SM)** Wet, Loose, Fine to Coarse Grained, Angular to Subangular Sand, with Silt, and Fine to Coarse Grained, Subangular Gravel, Little Clay. **CLAYEY SAND WITH GRAVEL (SC)** Moist, Dense to Very Dense, Fine to Medium Grained, Angular to Subangular Sand, with Clay, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Few Silt.			Filter sand pack - 12/20 washed silica Screen 53.5-63.5 ft - 0.020 slot SCH 40 PVC
60						

JACOBS®

PROJECT NUMBER:	BORING NUMBER:	
704758CH.05.06.FI	NBKK-CF1-MW03	SHEET 4 OF 4

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 261829.66 ft, E 1200465.53 ft | ELEVATION: 36.81 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 22.72 ft bgs | START: 10/14/22 14:20 | END: 10/15/22 12:45 | LOGGER: I. Dinkelman, T. Ta

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
65	8		**SILTY SAND WITH GRAVEL (SM)** Dark Gray (5Y 4/1), Moist, Medium Dense to Dense, Fine to Medium Grained, Subangular Sand, with Silt, and Fine to Coarse Grained, Subangular Gravel, Little Clay.			
			CLAYEY SAND WITH GRAVEL (SC) Dark Gray (2.5Y 4/1), Moist, Dense to Very Dense, Fine to Coarse Grained, Subangular Sand, with Clay, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Few Silt.			Backfill: 63.5-70 ft - 12/20 washed silica
70			Bottom of Boring at 70.00 ft bgs on 10/15/22 12:45			
75						
80						

JACOBS

PROJECT NUMBER:	BORING NUMBER:
704758CH.05.06.FI	NBKK-OU2A5-MW01 SHEET 1 OF 4

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 262157.07 ft, E 1200526.77 ft | ELEVATION: 21.70 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 42.2 ft bgs | START: 10/31/22 09:10 | END: 11/1/22 10:15 | LOGGER: I. Dinkelman, J. Peery-Lemon

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
			Hand Augered and Air Knifed; soil not logged		13:10 Collected NBKK-OU2A5-SS01-0H01 on 9/7/22	Monument - Flush mount and concrete
5			**SILTY SAND WITH GRAVEL (SM)** Dark Grayish Brown (2.5Y 4/2), Moist, Dense to Very Dense, Fine to Coarse Grained, Angular to Subangular, Sand with Silt, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Little Clay.			
	8		**SILTY SAND WITH GRAVEL (SM)** Grayish Brown (2.5Y 5/2), Moist, Dense, Fine to Medium Grained, Subangular Sand, with Silt, and Fine to Coarse Grained, Angular to Subangular Gravel, Little Clay. Trace Dense to very dense well cemented clasts of silty sand.		9:10 Previously air knife and hand auger on 9/8. Material may have sloughed in. Good recovery	
10			**CLAYEY SAND WITH GRAVEL (SC)** Olive Brown (2.5Y 4/3), Dense to Very Dense, Fine to Coarse Grained, Angular to Subangular Sand, with Clay, and Fine to Coarse Grained, Subangular Gravel, Few Silt.			
15	10		**SILTY SAND WITH GRAVEL (SM)** Grayish Brown (2.5Y 5/2), Moist, Dense, Fine to Coarse Grained, Angular to Subangular Sand, with Silt, and Fine to Coarse Grained, Subangular Gravel, Little Clay, Trace cobble.			
			CLAYEY SAND WITH GRAVEL (SC) Dark Gray (5Y 4/1), Moist, Dense to Very Dense, Fine to Coarse Grained, Angular to Subangular Sand, with Clay, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Few Silt.			
20						

JACOBS®

PROJECT NUMBER:	BORING NUMBER:
704758CH.05.06.FI	NBKK-OU2A5-MW01 SHEET 2 OF 4

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 262157.07 ft, E 1200526.77 ft | ELEVATION: 21.70 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 42.2 ft bgs | START: 10/31/22 09:10 | END: 11/1/22 10:15 | LOGGER: I. Dinkelman, J. Peery-Lemon

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
25	10					Seal - Hydrated 3/8 bentonite chips
30						
35	9					
			SILTY SAND WITH GRAVEL (SM) Grayish Brown (2.5Y 5/2), Moist, Medium Dense to Dense, Fine to Coarse Grained, Angular to Subangular Sand, with Silt, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Few Clay.		14:00 Collected NBKK-OU2A5-SB01-3637 on 10/31/22	
40						

JACOBS

PROJECT NUMBER:	BORING NUMBER:
704758CH.05.06.FI	NBKK-OU2A5-MW01 SHEET 3 OF 4

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 262157.07 ft, E 1200526.77 ft | ELEVATION: 21.70 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 42.2 ft bgs | START: 10/31/22 09:10 | END: 11/1/22 10:15 | LOGGER: I. Dinkelman, J. Peery-Lemon

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
45	8					
50			**SILTY SAND WITH GRAVEL (SM)** Gray (2.5Y 5/1), Moist, Dense, Fine to Coarse Grained, Angular to Subangular Sand, with Silt, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Little Clay. There are well cemented clasts that have a hard consistency. Sand is mostly fine and medium grain size with few coarse grains.			Filter sand pack - 12/20 washed silica Screen 40-60 ft - 0.020 slot SCH 40 PVC
55			**CLAYEY SAND WITH GRAVEL (SC)** Moist, Fine to Coarse Grained, Angular to Subangular Sand, with Clay, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Few Silt. With wet sand stringers at ~ 53.0. **POORLY GRADED SAND WITH SILT (SP-SM)** Olive Gray (5Y 4/2), Wet, Loose, Fine to Medium Grained, Subangular Sand with Silt, and Trace Fine Grained, Subangular Gravel, Few Clay. **SILTY SAND WITH GRAVEL (SM)** Greenish Gray (10Y 5/1), Wet, Medium Dense, Loose, Fine to Coarse Grained, Angular to Subangular Sand with Silt, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Few Clay.			
60						

JACOBS®

PROJECT NUMBER:	BORING NUMBER:
704758CH.05.06.FI	NBKK-OU2A5-MW01 SHEET 4 OF 4

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 262157.07 ft, E 1200526.77 ft | ELEVATION: 21.70 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 42.2 ft bgs | START: 10/31/22 09:10 | END: 11/1/22 10:15 | LOGGER: I. Dinkelman, J. Peery-Lemon

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
			CLAYEY SAND WITH GRAVEL (SC) Gray (5Y 5/1), Moist, Moderate to Well Cemented, Cohesive, Medium Dense, Fine to Coarse Grained, Angular to Subangular Sand with Clay, and Fine to Coarse Grained, Subangular Gravel, Few Silt.			Backfill: 60-61 ft - 12/20 washed silica
			Bottom of Boring at 61.00 ft bgs on 11/1/22 10:15			
65						
70						
75						
80						

JACOBS

PROJECT NUMBER:	BORING NUMBER:
704758CH.05.06.FI	NBKK-OU2A5-MW02 SHEET 1 OF 3

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 262048.66 ft, E 1200606.00 ft | ELEVATION: 18.50 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 36.4 ft bgs | START: 10/29/22 09:20 | END: 10/29/22 17:40 | LOGGER: I. Dinkelman, G. Riley

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
			Hand Augered and Air Knifed; soil not logged		PID= 0.0 (ppm) 11:15 Collected NBKK-OU2A5-SB02-0102on 9/7/22	Monument - Flush mount and concrete
5			**SANDY LEAN CLAY WITH GRAVEL (CL)** Grayish Brown (2.5Y 5/2), Moist, Very Stiff, Medium to High Plasticity Clay with Fine to Medium Grained, Angular to Subangular Sand, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Little Silt.		Hand auger to 3 ft bgs, air knife to 6 ft bgs	
10			**CLAYEY SAND WITH GRAVEL (SC)** Moist, Dense, Fine to Coarse Grained, Angular to Subangular Sand, with Clay, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Few Silt.		9:10 Slow drilling. Tight formation	
15	10					Grout
20						

JACOBS®

PROJECT NUMBER:	BORING NUMBER:
704758CH.05.06.FI	NBKK-OU2A5-MW02 SHEET 2 OF 3

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 262048.66 ft, E 1200606.00 ft | ELEVATION: 18.50 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 36.4 ft bgs | START: 10/29/22 09:20 | END: 10/29/22 17:40 | LOGGER: I. Dinkelman, G. Riley

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
25	9					
			No Recovery			
			CLAYEY SAND WITH GRAVEL (SC) Moist, Dense, Fine to Coarse Grained, Angular to Subangular Sand, with Clay, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Few Silt, Trace cobbles.			
			SILTY SAND WITH GRAVEL (SM) Moist, Medium Dense to Dense, Fine to Coarse Grained, Angular to Subangular Sand, with Silt, and Fine to Coarse Grained, Subangular Gravel, Little Clay.		13:15 Collected NBKK-OU2A5-SB02-2930 on 10/29/22	
30			**CLAYEY SAND WITH GRAVEL (SC)** Moist, Dense, Fine to Coarse Grained, Angular to Subangular Sand, with Clay, and Fine to Coarse Grained, Subangular Gravel, Few Silt.			
			SILTY SAND WITH GRAVEL (SM) Moist, Dense to Very Dense, Fine to Coarse Grained, Angular to Subangular Sand with Silt, and Fine to Coarse Grained, Subangular Gravel, Few Clay.			
			CLAYEY SAND WITH GRAVEL (SC) Moist, Dense to Very Dense, Fine to Coarse Grained, Angular to Subangular Sand, with Clay, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Few Silt.			
35	8.5					Seal - Hydrated 3/8 bentonite chips
			SILTY SAND (SM) Moist, Dense, Fine to Coarse Grained, Angular to Subangular Sand, with Silt, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Few Clay.			
40						

JACOBS®

PROJECT NUMBER:	BORING NUMBER:
704758CH.05.06.FI	NBKK-OU2A5-MW02 SHEET 3 OF 3

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 262048.66 ft, E 1200606.00 ft | ELEVATION: 18.50 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 36.4 ft bgs | START: 10/29/22 09:20 | END: 10/29/22 17:40 | LOGGER: I. Dinkelman, G. Riley

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
			SILTY SAND WITH GRAVEL (SM) Dark Gray (5Y 4/1), Moist, Dense, Fine to Coarse Grained, Angular to Subangular Sand with Silt, and Fine to Coarse Grained, Subangular Gravel, Few Clay.			
			CLAYEY SAND WITH GRAVEL (SC) Moist, Dense, Fine to Coarse Grained, Angular to Subangular Sand, with Clay, and Fine to Coarse Grained, Subangular Gravel, Few Silt. Sand stringer interbedded in core that is wet.			
			SILTY SAND WITH GRAVEL (SM) Dense to Medium Dense, Fine to Coarse Grained, Angular to Subangular Sand, with Silt, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Little Clay. Cohesive with sand 'stringers'.			
45	9		**WELL GRADED SAND WITH SILT (SW-SM)** Gray (5Y 5/1), Wet, Loose, Fine to Coarse Grained, Angular to Subangular Sand with Silt, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Little Clay.			
			CLAYEY SAND WITH GRAVEL (SC) Greenish Gray (10Y 5/1), Moist, Dense to Medium Dense, Fine to Coarse Grained, Angular to Subangular Sand, with Clay, and Fine to Coarse Grained, Subangular Gravel, Few Silt.			
50						Filter sand pack - 12/20 washed silica Screen 40-60 ft - 0.020 slot SCH 40 PVC
			SILTY SAND WITH GRAVEL (SM) Gray (2.5Y 5/1), Moist, Medium Dense, Fine to Coarse Grained, Angular to Subangular Sand, with Silt, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Few Silt.			
55	8.25					
			CLAYEY SAND WITH GRAVEL (SC) Dark Greenish Black (10Y 4/1), Moist, Dense, Fine to Coarse Grained, Angular to Subangular Sand with Clay, and Fine to Coarse Grained, Subangular Gravel, Few Silt.			
			WELL-GRADED SAND WITH SILT AND GRAVEL (SW-SM) Gray (5Y 5/1), Wet, Loose, Fine to Coarse Grained, Angular to Subangular Sand with Silt, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Little Clay.			
60						

Bottom of Boring at 60.00 ft bgs on 10/29/22 17:40

JACOBS

PROJECT NUMBER:	BORING NUMBER:
704758CH.05.06.FI	NBKK-OU2A5-MW03 SHEET 1 OF 4

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 261997.87 ft, E 1200537.19 ft | ELEVATION: 26.17 ft NAVD88

DRILLING CONTRACTOR: Holt Drilling | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 11.49 ft bgs | START: 9/7/22 12:50 | END: 9/8/22 12:35 | LOGGER: I. Dinkelman, C. Dronfield, J. Peery-Lemon

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
			Hand Augered and Air Knifed; soil not logged		PID= 0.0 (ppm) 10:50 Collected NBKK-OU2A5-SS03-0102 on 9/7/22	Monument - Flush mount and concrete
					Hand auger to 3 ft bgs, air knife to 6 ft bgs	
5	5.5		**SILTY SAND WITH GRAVEL (SM)** Light Yellowish Brown (10YR 6/4), Dry, Loose to Very Loose, Soft to Very Soft, Sand with Silt, and Fine to Coarse Grained, Angular to Subangular Gravel, Trace Clay. Organic sand roots in core sample.			
10			**SILTY SAND WITH GRAVEL (SM)** Grayish Brown (10YR 5/2), Moist, Medium Dense to Dense Sand with Silt, and Fine to Coarse Grained, Angular to Subangular Gravel, Little Clay.			Seal - Hydrated 3/8 bentonite chips
15	8					
20						

JACOBS

PROJECT NUMBER:	BORING NUMBER:
704758CH.05.06.FI	NBKK-OU2A5-MW03 SHEET 2 OF 4

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 261997.87 ft, E 1200537.19 ft | ELEVATION: 26.17 ft NAVD88

DRILLING CONTRACTOR: Holt Drilling | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 11.49 ft bgs | START: 9/7/22 12:50 | END: 9/8/22 12:35 | LOGGER: I. Dinkelman, C. Dronfield, J. Peery-Lemon

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
25	6				PID= 0.0 (ppm) 13:09 Some soil backfilled by air knife prior to drilling.	
30					PID= 0.0 (ppm)	Filter sand pack - 12/20 washed silica Screen 20-40 ft - 0.020 slot SCH 40 PVC
			SILTY SAND WITH GRAVEL (SM) Dark Grayish Brown (10YR 4/2), Moist, Medium Dense to Dense, Fine to Coarse Grained, Subangular Sand with Silt, and Fine to Coarse Grained, Angular to Subrounded Gravel, Little Clay. Larger and more gravel observed.		11:10 Collected NBKK-OU2A5-SB03-3334 on 9/8/22	
35	9		**CLAYEY GRAVEL (GC)** Moist, Dense, Fine to Coarse Grained, Subangular to Subrounded Gravel, with Clay, and Fine Grained, Subangular Sand, Few Silt.			
40						

JACOBS

PROJECT NUMBER:	BORING NUMBER:
704758CH.05.06.FI	NBKK-OU2A5-MW03 SHEET 3 OF 4

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 261997.87 ft, E 1200537.19 ft | ELEVATION: 26.17 ft NAVD88

DRILLING CONTRACTOR: Holt Drilling | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 11.49 ft bgs | START: 9/7/22 12:50 | END: 9/8/22 12:35 | LOGGER: I. Dinkelman, C. Dronfield, J. Peery-Lemon

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
			SILTY SAND WITH GRAVEL (SM) Grayish Brown (2.5Y 5/2), Moist, Medium Dense to Dense, Fine to Coarse Grained, Angular to Subangular Sand, with Silt, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Little Clay.		PID= 0.0 (ppm)	
45	8		**SILTY SAND WITH GRAVEL (SM)** Dark Gray (2.5Y 4/1), Moist, Dense to Very Dense, Fine to Medium Grained Sand, with Silt, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Little Clay.			
50			**SILTY SAND WITH GRAVEL (SM)** Dark Gray (5Y 4/1), Medium Dense, Fine to Coarse Grained, Angular to Subangular Sand with Silt, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Little Clay.		PID= 0.0 (ppm)	
55	8.5		**SILTY SAND WITH GRAVEL (SM)** Dark Gray (5Y 4/1), Medium Dense, Fine to Coarse Grained, Angular to Subangular Sand with Silt, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Little Clay.			Backfill: 40-70 ft - 12/20 washed silica
60						

JACOBS®

PROJECT NUMBER:	BORING NUMBER:
704758CH.05.06.FI	NBKK-OU2A5-MW03 SHEET 4 OF 4

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 261997.87 ft, E 1200537.19 ft | ELEVATION: 26.17 ft NAVD88

DRILLING CONTRACTOR: Holt Drilling | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 11.49 ft bgs | START: 9/7/22 12:50 | END: 9/8/22 12:35 | LOGGER: I. Dinkelman, C. Dronfield, J. Peery-Lemon

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
65	8				PID= 0.0 (ppm)	
70			Bottom of Boring at 70.00 ft bgs on 9/8/22 12:35			
75						
80						

JACOBS®

PROJECT NUMBER:	BORING NUMBER:
704758CH.05.06.FI	NBKK-OU2A5-SB04 SHEET 1 OF 1

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 262069.11 ft, E 1200471.43 ft | ELEVATION: NA

DRILLING CONTRACTOR: Yellow Jacket | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: | START: 11/1/22 19:00 | END: 11/1/22 19:00 | LOGGER: I. Dinkleman, J. Peery-Lemon

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
			SILTY SAND WITH GRAVEL (SM) Dark Brown (10YR 3/3), Moist, Loose, Medium Dense, Fine to Coarse Grained, Angular to Subangular Sand with Silt, and Fine to Coarse Grained, Subangular Gravels, Little Clay. 0-0.25 asphalt. Little asphalt in upper zone. Few clayey sand clasts which are moderately cemented and cohesive.		12:45 Collected NBKK-OU2A5-SB04-0203 from 2'-3' 14:30 Collected NBKK-OU2A5-SB04-0506 from 5'-6'	
			CLAYEY SAND WITH GRAVEL (SC) Brown (7.5YR 4/3), Moist, Medium Dense, Fine to Coarse Grained, Angular to Subangular Sand with Silt, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Few Clay.			
5	11		**SILTY SAND WITH GRAVEL (SM)** Olive Brown (2.5Y 4/3), Loose, Medium Dense, Fine to Coarse Grained, Angular to Subangular Sand with Silt, and Trace Fine Grained, Subangular Gravel, Few Clay. Some small masses of clayey sand.			
10			Bottom of Boring at 10.00 ft bgs on 11/1/22 19:00			
15						
20						

JACOBS

PROJECT NUMBER:	BORING NUMBER:
704758CH.05.06.FI	NBKK-OU2A5-SB05 SHEET 1 OF 1

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 262027.38 ft, E 1200551.91 ft | ELEVATION: NA

DRILLING CONTRACTOR: Yellow Jacket | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: | START: 11/1/22 19:00 | END: 11/1/22 19:00 | LOGGER: I. Dinkleman, J. Peery-Lemon

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
	12		**SILTY SAND WITH GRAVEL (SM)** Yellowish Brown (10YR 5/4), Dry, Loose, Soft, Fine to Coarse Grained, Angular to Subangular Sand with Silt, and Fine Grained, Angular to Subangular Gravel, Little Clay.		10:55 Collected NBKK-OU2A5-SB05-0203 from 2'-3' 12:10 Collected NBKK-OU2A5-SB05-1011 from 10'-11'	
			SILTY SAND WITH GRAVEL (SM) Olive Brown (2.5Y 4/3), Moist, Medium Dense to Dense, Fine to Medium Grained, Angular to Subangular Sand with Silt, and Fine to Coarse Grained, Angular to Subangular Gravel, Little Clay, Trace cobbles.			
5						
10			**CLAYEY SAND WITH GRAVEL (SC)** Light Olive Brown (2.5Y 5/3), Moist, Dense to Very Dense, Fine to Medium Grained, Angular to Subangular Sand with Silt, and Fine Grained, Subangular Gravel, Few Clay.			
			Bottom of Boring at 12.00 ft bgs on 11/1/22 19:00			
15						
20						

JACOBS

PROJECT NUMBER:	BORING NUMBER:
704758CH.05.06.FI	NBKK-B1006-MW01 SHEET 1 OF 2

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS

LOCATION: NUWC Division Keyport

COORDINATES: N 258601.17 ft, E 1199301.97 ft

ELEVATION: 13.82 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket

DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 3.25 ft bgs

START: 10/8/22 13:00

END: 10/10/22 14:00

LOGGER: I. Dinkelman

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
			SILTY SAND WITH GRAVEL (SM) Brown (10YR 4/3), Moist, Fine to Coarse Grained, Subangular to Subrounded Sand with Silt, and Fine to Coarse Grained, Angular to Subangular Gravel, Little Clay.		PID= 0.0 (ppm)	Monument - Flush mount and concrete
			WELL GRADED SAND WITH SILT (SW-SM) Olive Gray (5Y 4/2), Moist, Loose, Fine to Coarse Grained, Angular to Subangular Sand with Soft Silt, and Trace Fine Grained, Subangular Gravel.		09:35 Collected NBKK-B1006-SS01-0102 on 10/1/22	Seal - Hydrated 3/8 bentonite chips
			WELL GRADED SAND WITH SILT AND GRAVEL (SW-SM) Reddish Brown (5YR 4/4), Wet, Fine to Coarse Grained, Angular to Subangular Sand with Silt, and Fine Grained Gravel, Trace Clay.		Water encountered at ~3.0 ft bgs	
5					Air Knife to 3.0 ft bgs, Hand Auger to 6.0 ft bgs	
	5					Filter sand pack - 12/20 washed silica Screen 4-14 ft - 0.020 slot SCH 40 PVC
10			**FAT CLAY (CH)** Dark Gray (4/N), Moist, Very Stiff Clay, with Trace Fine to Medium Grained Sand.			
15	10					
20						

JACOBS®

PROJECT NUMBER:	BORING NUMBER:
704758CH.05.06.FI	NBKK-B1006-MW01 SHEET 2 OF 2

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS
LOCATION: NUWC Division Keyport

COORDINATES: N 258601.17 ft, E 1199301.97 ft
ELEVATION: 13.82 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket
DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 3.25 ft bgs
START: 10/8/22 13:00
END: 10/10/22 14:00
LOGGER: I. Dinkelman

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
25	9.5		**SANDY FAT CLAY (CH)** Dark Gray (2.5Y 4/1), Moist, Very Stiff, High Plasticity Clay with Fine Grained, Subangular Sand and Little Silt.			Backfill: 14-30 ft - 12/20 washed silica
30			Bottom of Boring at 30.00 ft bgs on 10/10/22 14:00			
35						
40						

JACOBS

PROJECT NUMBER:	BORING NUMBER:
704758CH.05.06.FI	NBKK-B1006-MW02 SHEET 1 OF 2

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 258531.35 ft, E 1199373.56 ft | ELEVATION: 12.65 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 2.75 ft bgs | START: 10/11/22 08:55 | END: 10/11/22 14:30 | LOGGER: I. Dinkelman, T. Ta

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
			Hand Augered; soil not logged		PID= 0.0 (ppm) 10:55 Collected NBKK-B1006-SS02-0102 on 10/1/22 Water encountered at ~2.75 ft bgs	Monument - Flush mount and concrete Seal - Hydrated 3/8 bentonite chips
5						
	4		**WELL GRADED SAND WITH SILT (SW-SM)** Olive Brown (2.5Y 4/3), Wet, Very Loose to Loose, Fine to Coarse Grained, Subangular to Subrounded Sand with Silt, and Trace Clay. Silty sand transitioning (SM) quickly to a well graded sand with silt at ~6.5' with thin layers of staining (oxidation) at 6.5 and 9.0'.		9:10 Air knife on 10/1 to 6.0'. Hand Auger from ~ 0.0-3.0'	Filter sand pack - 12/20 washed silica Screen 4-14 ft - 0.020 slot SCH 40 PVC
10			**FAT CLAY WITH SAND (CH)** Gray (5Y 5/1), Moist, Stiff, Medium Dense, Medium to High Plasticity Clay with Fine Grained Sand, and Little Silt.			
	9.5		**ELASTIC SILT (MH)** Olive Brown (2.5Y 4/4), Moist, Medium Dense, Slow to Medium Plasticity Silt with Trace Fine Grained, Subangular Gravel and Trace Medium Grained, Subangular Sand. Alternating bands of silty sand with trace gravel. Highly oxidized zone in silty sand with trace gravel at ~ 14.0'.			
15			**CLAYEY SAND WITH GRAVEL (SC)** Brown (10YR 5/3), Wet, Medium Dense to Dense, Fine to Coarse Grained, Angular to Subangular Sand, with Clay, and Fine to Coarse Grained, Subangular to Subrounded Gravel. Trace cobbles up to 3.5/4.0" in diameter.			Backfill: 14-20 ft - 12/20 washed silica
20						

JACOBS®

PROJECT NUMBER:	BORING NUMBER:
704758CH.05.06.FI	NBKK-B1006-MW02 SHEET 2 OF 2

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 258531.35 ft, E 1199373.56 ft | ELEVATION: 12.65 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 2.75 ft bgs | START: 10/11/22 08:55 | END: 10/11/22 14:30 | LOGGER: I. Dinkelman, T. Ta

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
			CLAYEY SAND WITH GRAVEL (SC) Dark Gray (4/N), Wet, Medium Dense to Dense, Fine to Coarse Grained, Subangular Sand with Clay and Fine to Coarse Grained, Subangular to Subrounded Gravel, Trace Silt and Trace surrounded cobbles up to 3.5" in diameter.			
			Bottom of Boring at 20.00 ft bgs on 10/11/22 14:30			
25						
30						
35						
40						

JACOBS

PROJECT NUMBER:	BORING NUMBER:
704758CH.05.06.FI	NBKK-B1006-MW03 SHEET 1 OF 1

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 258378.49 ft, E 1199277.61 ft | ELEVATION: 18.14 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 6.9 ft bgs | START: 10/11/22 15:15 | END: 10/12/22 11:30 | LOGGER: I. Dinkelman, T. Ta

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
			SILTY SAND WITH GRAVEL (SM) Light Olive Brown (2.5Y 5/3), Dry, Fine to Coarse Grained, Angular to Subangular Sand, with Silt, and Fine to Coarse Grained, Subangular Gravel, Trace Clay.		PID= 0.0 (ppm) 11:30 Collected NBKK-B1006-SS03-0001 on 10/1/22	Monument - Flush mount and concrete
			No Recovery			Seal - Hydrated 3/8 bentonite chips
5						
	4.5		**WELL GRADED SAND WITH SILT (SW-SM)** Yellowish Brown (10YR 5/6), Wet, Fine Grained, Subangular Sand, with Silt, and Fine to Coarse Grained, Subangular Gravel, Trace Clay.		Hand auger to 3.0 ft bgs, Air knife to 6.0 ft bgs	
10			**WELL GRADED SAND WITH SILT (SW-SM)** Wet, Loose, Fine Grained, Subangular Sand, with Silt and Fine to Coarse Grained, Angular to Subangular Gravel, Little Clay.			Filter sand pack - 12/20 washed silica
			CLAYEY SAND (SC) Grayish Brown (10YR 5/2), Wet, Medium Dense, Fine to Coarse Grained, Angular to Subangular Sand with Clay and Trace Gravel. Alternating stratified bands of silt, sand, and clay.			Screen 6-16 ft - 0.020 slot SCH 40 PVC
15			**WELL GRADED SAND WITH SILT (SW-SM)** Dark Yellowish Brown (10YR 4/4), Wet, Loose, Fine Grained, Angular to Subangular Sand with Silt, and Fine to Coarse Grained, Subangular Gravel, Trace Clay.			Backfill: 16-20 ft - 12/20 washed silica
20						

Bottom of Boring at 20.00 ft bgs on 10/12/22 11:30

JACOBS®

PROJECT NUMBER:	BORING NUMBER:
704758CH.05.06.FI	NBKK-B1006-MW04 SHEET 1 OF 1

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 258348.70 ft, E 1199351.39 ft | ELEVATION: 15.75 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 5.85 ft bgs | START: 11/3/22 13:05 | END: 11/3/22 16:35 | LOGGER: I. Dinkelman, J. Peery-Lemon

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
			Hand Augered; soil not logged		13:10 Collected NBKK-B1006-SS04-0H01 on 11/3/22	Monument - Flush mount and concrete
						Seal - Hydrated 3/8 bentonite chips
5			**WELL GRADED SAND WITH SILT (SW-SM)** Wet, Loose, Medium Dense, Fine to Coarse Grained, Subangular Sand, with Silt, and Trace Fine Grained, Subangular Gravel, Little Clay.			
					Hand auger to 3.0 ft bgs, Air knife to 6.0 ft bgs	
	6					
10						Filter sand pack - 12/20 washed silica
			WELL-GRADED SAND WITH SILT AND GRAVEL (SW-SM) Wet, Loose, Fine to Coarse Grained, Angular to Subangular Sand with Silt, and Fine Grained, Subangular Gravel, Trace Clay. With disbursed lenses of fat clay Grayish Brown (10 YR 5/2).			Screen 5-15 ft - 0.020 slot SCH 40 PVC
			LEAN CLAY WITH SAND (CL) Laminated in thin beds of alternating colors in 10Y/2.5Y transitioning to GLEY 1, Moist, Dense, Stiff, Medium to High Plasticity Clay with Fine to Medium Grained, Subangular Sand, and Little Silt.			
15	9		**WELL GRADED SAND WITH SILT (SW-SM)** Wet, Loose, Fine to Coarse Grained, Angular to Subangular Sand, with Silt, and Little Clay. Few scatted small clay lenses.			Backfill: 15-20 ft - 12/20 washed silica
20						

Bottom of Boring at 20.00 ft bgs on 11/3/22 16:35

JACOBS

PROJECT NUMBER:	BORING NUMBER:
704758CH.05.06.FI	NBKK-OU2A2-MW01 SHEET 1 OF 1

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 257991.88 ft, E 1198880.93 ft | ELEVATION: 28.39 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 4.4 ft bgs | START: 11/5/22 09:20 | END: 11/5/22 14:50 | LOGGER: I. Dinkelman, J. Peery-Lemon

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
			Hand Augered and Air Knifed; soil not logged		PID= 0.0 (ppm) 09:00 Collected NBKK-OU2A2-SS01-0H01 on 11/5/22	Monument - Flush mount and concrete Seal - Hydrated 3/8 bentonite chips
5						
	4		**SILTY SAND WITH GRAVEL (SM)** Dark Brown (10YR 3/3), Wet, Loose, Medium Dense, Fine to Coarse Grained, Angular to Subangular Sand, with Silt, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Few Clay. **SILTY SAND WITH GRAVEL (SM)** Very Dark Grayish Brown (10YR 3/2), Wet, Medium Dense, Fine to Coarse Grained, Angular to Subangular Sand with Silt, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Little Clay. Little organics observed. Alternating bands of organic, silts and sands.		Hand auger to 3.0 ft bgs, Air knife to 6.0 ft bgs	
10						Filter sand pack - 12/20 washed silica Screen 4-14 ft - 0.020 slot SCH 40 PVC
	9		**CLAYEY SAND WITH GRAVEL (SC)** Dark Gray (4/N), Wet, Medium Dense, Medium Plasticity, Fine to Coarse Grained, Angular to Subangular Sand, with Clay, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Few Silt. Lean clay lens at approximately 11.0' bgs. 2.5" thickness. **SILTY SAND (SM)** Dark Greenish Gray (10Y 3/1), Wet, Loose, Medium Dense, Rapid Dilatancy, Non Plastic, Fine to Medium Grained, Angular to Subangular Sand, with Silt, and Trace Coarse Grained, Subrounded Gravel, Little Clay.			
15			**POORLY GRADED SAND WITH SILT (SP-SM)** Gray (5/N), Wet, Loose, Fine to Medium Grained, Angular to Subangular Sand with Silt, and Some to Little Clay.			Backfill: 14-20 ft - 12/20 washed silica
20						

Bottom of Boring at 20.00 ft bgs on 11/5/22 14:50

JACOBS®

PROJECT NUMBER:	BORING NUMBER:
704758CH.05.06.FI	NBKK-OU2A2-MW02 SHEET 1 OF 1

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 258065.55 ft, E 1199013.51 ft | ELEVATION: 25.42 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 4.25 ft bgs | START: 11/4/22 09:45 | END: 11/4/22 13:00 | LOGGER: I. Dinkelman, J. Peery-Lemon

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
			Hand Augered and Air Knifed; soil not logged		PID= 0.0 (ppm) 10:10 Collected NBKK-OU2A2-SS02-0H01 on 11/4/22	Monument - Flush mount and concrete Seal - Hydrated 3/8 bentonite chips
5	6		**SILTY SAND WITH GRAVEL (SM)** Dark Grayish Brown (2.5Y 4/2), Wet, Loose, Fine to Coarse Grained, Angular to Subangular Sand with Silt, and Fine to Coarse Grained, Subangular Gravel, Little Clay. Trace cobble up to 3.5" diameter subangular. **LEAN CLAY WITH SAND (CL)** Gray (2.5Y 6/1), Moist, Medium Dense, Medium Plasticity Clay with Fine to Coarse Grained, Angular to Subangular Sand, and Little Silt. **POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM)** Dark Gray (4/N), Wet, Loose, Rapid Dilatancy, Fine to Medium Grained, Subangular Sand, with Silt, and Little Clay.		Hand auger to 3.0 ft bgs, Air knife to 5.0 ft bgs	
10						Filter sand pack - 12/20 washed silica Screen 4-14 ft - 0.020 slot SCH 40 PVC
15	9		**SILT WITH SAND (ML)** Dark Gray (4/N), Wet, Soft, Medium Toughness, Rapid Dilatancy, Non Plastic Silt with Fine Grained, Subangular to Subrounded Sand, Little Clay. Interbedded with lean clay lenses at ~16.5 and ~18.5' of approximately 4.0" thickness.			Backfill: 14-20 ft - 12/20 washed silica
20						

Bottom of Boring at 20.00 ft bgs on 11/4/22 13:00

JACOBS

PROJECT NUMBER:	BORING NUMBER:
704758CH.05.06.FI	NBKK-OU2A2-MW03 SHEET 1 OF 1

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 258060.35 ft, E 1199068.93 ft | ELEVATION: 23.60 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 4.8 ft bgs | START: 11/4/22 13:15 | END: 11/5/22 08:50 | LOGGER: I. Dinkelman, J. Peery-Lemon

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
			Hand Augered and Air Knifed; soil not logged		PID= 0.0 (ppm)	Monument - Flush mount and concrete
					13:30 NBKK-OU2A2-SS03-0203 on 11/4/22	Seal - Hydrated 3/8 bentonite chips
5			**SILTY SAND WITH GRAVEL (SM)** Light Brownish Gray (2.5Y 6/2), Wet, Loose, Fine to Coarse Grained, Angular to Subangular Sand with Silt, and Subangular to Subrounded Gravel, Little Clay.			
	6		**CLAYEY SAND WITH GRAVEL (SC)** Very Dark Grayish (2.5Y 3/2), Wet, Loose, Medium Dense, Fine to Coarse Grained, Angular to Subangular Sand, with Silt, and Fine Grained, Subangular Gravel, Few Clay. Wood (root) observed at ~ 7.25'.		Hand auger to 3.0 ft bgs, Air knife to 6.0 ft bgs	
10			**POORLY GRADED SAND WITH SILT (SP-SM)** Dark Gray (4/N), Wet, Medium Dense, Rapid Dilatancy, Fine to Medium Grained, Angular to Subangular, Sand with Silt, Little Clay. Few interbedded layers of Sand where coarser grains are observed.			Filter sand pack - 12/20 washed silica Screen 4-14 ft - 0.020 slot SCH 40 PVC
15	9.5		**SANDY SILT (ML)** Gray (5/N), Moist, Medium, Rapid Dilatancy, Non Plastic Silt with Fine to Medium Grained, Subangular Sand, Few Clay. Alternating bands of poorly graded sand (medium grain) GLEY 1 N/4.			Backfill: 14-20 ft - 12/20 washed silica
20						

Bottom of Boring at 20.00 ft bgs on 11/5/22 08:50

JACOBS®

PROJECT NUMBER:	BORING NUMBER:
704758CH.05.06.FI	NBKK-OU2A2-MW04 SHEET 1 OF 1

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 257985.52 ft, E 1199201.50 ft | ELEVATION: 23.98 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 8.65 ft bgs | START: 11/7/22 10:50 | END: 11/7/22 16:15 | LOGGER: I. Dinkelman, J. Peery-Lemon

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
			Hand Augered and Air Knifed; soil not logged			Monument - Flush mount and concrete
			CLAYEY GRAVEL WITH SAND (GC) Dark Greenish Gray (10Y 3/1), Moist, Dense, Fine to Coarse Grained, Subangular Gravel, with Clay, and Fine to Coarse Grained, Angular to Subangular Sand, Few Silt.		PID = 5.1 (ppm) 11:45 NBKK-OU2A2-SS04-0203 on 11/7/22	Seal - Hydrated 3/8 bentonite chips
			Hand Augered and Air Knifed, Not Logged			
5						
	2.5		**WELL-GRADED SAND WITH SILT AND GRAVEL (SW-SM)** Dark Gray (4/N), Moist, Loose, Fine to Coarse Grained, Angular to Subangular Sand, with Silt, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Little Clay.		PID = 15.6 (ppm) 13:11 Moderate to strong Hydrocarbon odor detected, Hand auger to 3.0 ft bgs, Air knife to 6.0 ft bgs	
			SILTY SAND WITH GRAVEL (SM) Very Dark Grayish Brown (10YR 3/2), Moist, Medium Dense, Fine to Coarse Grained, Subangular Sand with Silt, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Little Clay. Organics observed; Roots.		PID = 78.6 (ppm) PID = 2.7 (ppm)	
10			**SANDY LEAN CLAY (CL)** Gray (2.5Y 6/1), Wet, Dense, Stiff, Low Plasticity Clay with Fine to Medium Grained, Subangular Sand, and Few Silt. Alternating laminations of clayey sand and silty sand and sand layers.		PID = 0.3 (ppm)	Filter sand pack - 12/20 washed silica
			POORLY GRADED SAND WITH SILT (SP-SM) Gray (2.5Y 5/1), Wet, Loose, Fine to Medium Grained, Angular to Subangular Sand Little Silt, and Trace Clay.			Screen 7-17 ft - 0.020 slot SCH 40 PVC
15	9.25					
			SILTY SAND WITH GRAVEL (SM) Grayish Brown (2.5Y 5/2), Wet, Dense, Fine to Medium Grained, Subangular Sand with Silt, and Little Clay.			Backfill: 17-20 ft - 12/20 washed silica
20						

Bottom of Boring at 20.00 ft bgs on 11/7/22 16:15

JACOBS

PROJECT NUMBER:	BORING NUMBER:
704758CH.05.06.FI	NBKK-OU2A2-MW05 SHEET 1 OF 1

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 257920.78 ft, E 1199205.13 ft | ELEVATION: 24.90 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 8.2 ft bgs | START: 11/8/22 09:00 | END: 11/8/22 14:40 | LOGGER: I. Dinkelman, J. Peery-Lemon

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
			Hand Augered and Air Knifed; soil not logged		09:10 Collected NBKK-OU2A2-SS05-0102 on 11/8/22	Monument - Flush mount and concrete
5						Seal - Hydrated 3/8 bentonite chips
	6		**SANDY ELASTIC SILT WITH GRAVEL (MH)** Very Dark Gray (3/N), Wet, Dense, Stiff, Slow Dilatancy, Medium Plasticity Silt with Fine to Coarse Grained, Subrounded Gravel, and Fine to Medium Grained, Angular to Subangular Sand, Little Clay. A sand stringer from 13.0-13.5' bgs consisting of a poorly graded, medium grained sand with Silt.		Hand auger to 3.0 ft bgs, Air knife to 6.0 ft bgs 10:11 Mostly clay. Stretched during core sample collection.	
10						Filter sand pack - 12/20 washed silica Screen 7-17 ft - 0.020 slot SCH 40 PVC
15	10		**SANDY FAT CLAY WITH GRAVEL (CH)** Dark Greenish Gray (10Y 3/1), Moist, Dense, Very Stiff, High Plasticity Clay with Fine Grained, Subangular Gravel, and Fine to Medium Grained Sand, Few Silt.			
20						Backfill: 17-20 ft - 12/20 washed silica

Bottom of Boring at 20.00 ft bgs on 11/8/22 14:40

JACOBS

PROJECT NUMBER:	BORING NUMBER:
704758CH.05.06.FI	NBKK-OU2A2-MW06 SHEET 1 OF 1

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 257939.13 ft, E 1199359.41 ft | ELEVATION: 20.93 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 4.8 ft bgs | START: 11/9/22 08:55 | END: 11/9/22 11:00 | LOGGER: I. Dinkelman, J. Peery-Lemon

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
			SILTY SAND WITH GRAVEL (SM) Dark Brown (10YR 3/3), Moist, Medium Dense, Fine to Coarse Grained, Subangular Sand, with Silt, and Fine to Coarse Grained, Subangular Gravel, Little Clay. Trace asphalt and few organic.		PID= 0.0 (ppm) 9:11 Hand auger to 6.0' bgs 10:40 Collected NBKK-OU2A2-SS06-0H01 on 11/8/22	Monument - Stick up and concrete
			SANDY FAT CLAY WITH GRAVEL (CH) Brown (10YR 4/3), Moist, Dense, Stiff, High Plasticity Clay, with Fine to Coarse Grained, Angular to Subangular Sand, with Fine to Coarse Grained, Subangular to Subrounded Gravel, Little Silt. Mostly asphalt in a sandy fat clay with gravel matrix. Trace organics.			Seal - Hydrated 3/8" bentonite chips
			SILTY SAND WITH GRAVEL (SM) Dark Olive Brown (2.5Y 3/3), Moist, Medium Dense, Loose, Fine to Coarse Grained, Subangular to Subrounded Sand, with Silt, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Trace Clay.		10:55 Collected NBKK-OU2A2-SS06-0304 on 11/8/22	
5	7		**CLAYEY SAND (SC)** Light Brownish Gray (10YR 6/2), Moist, Medium Dense, Medium to Coarse Grained, Subangular Sand with Clay, and Trace Fine Grained Gravel, Little Silt.			
			SILTY SAND (SM) Brownish Yellow (10YR 6/8), Wet, Medium Dense, Fine to Coarse Grained, Subangular Sand with Silt, and Little Clay.			
			LEAN CLAY WITH SAND (CL) Yellowish Brown (10YR 5/6), Moist, Stiff, Slow Dilatancy, Non Plastic Clay with Medium Grained, Subangular Sand, and Few Silt.			
			SANDY SILT (ML) Grayish Brown (2.5Y 5/2), Wet, Stiff, Rapid Dilatancy, Non Plastic Silt, with Fine Grained Subangular Sand, and Little Clay.			Filter sand pack - 12/20 washed silica Screen 4-14 ft - 0.020" slot SCH 40 PVC
10			**SILTY SAND (SM)** Wet, Loose, Medium Dense, Fine to Coarse Grained, Angular to Subangular Sand with Silt, and Few Clay. Interbedded with 'stringers' at 11.5' and 13.5' ~ 0.5' (6") thickness.			
15	9		**ELASTIC SILT (MH)** Dark Gray (5Y 4/1), Moist, Dense, Stiff, Slow Dilatancy, Low Plasticity Silt with Fine to Medium Grained, Subangular Sand, and Little Clay.			Backfill: 14-20 ft - 12/20 washed silica
20						

Bottom of Boring at 20.00 ft bgs on 11/9/22 11:00

JACOBS

PROJECT NUMBER:	BORING NUMBER:	
704758CH.05.06.FI	NBKK-S7-MW01	SHEET 1 OF 2

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 261189.11 ft, E 1201288.03 ft | ELEVATION: 13.69 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 10.7 ft bgs | START: 10/28/22 09:55 | END: 10/28/22 16:50 | LOGGER: I. Dinkelman, G. Riley

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
5			**WELL GRADED GRAVEL WITH SILT AND SAND (GW-GM)** Grayish Brown (2.5Y 5/2), Wet, Loose to Very Loose, Fine to Coarse Grained, Subangular Gravel with Fine to Coarse Grained, Subangular Sand, and Silt, Trace Clay. Encountered material at ~1.5' during Hand angering. Moist to wet.		10:00 Collected NBKK-S7-SS01-0102 on 10/28	Monument - Flush mount and concrete
	3				13:10 Air knife to 6.0'.	Seal - Hydrated 3/8 bentonite chips
10					13:30: Collected NBKK-S7-SB01-0809 on 10/28/22	
15	8		**SANDY LEAN CLAY WITH GRAVEL (CL)** Greenish Gray (10Y 5/1), Moist, Stiff Clay with Fine to Medium Grained, Subangular Sand, and Fine to Coarse Grained, Subangular Gravel, Few Silt. Few shell fragments. Slight to moderate H2S odor.			
			No Recovery			
20			**WELL GRADED SAND WITH SILT (SW-SM)** Dark Gray (4/N), Wet, Loose, Fine to Coarse Grained, Angular to Subangular Sand with Silt, and Trace Fine to Coarse Grained, Subangular to Subrounded Gravel, Trace Clay. Small shell fragments observed. Slight H2S odor.			Filter sand pack - 12/20 washed silica Screen 9-29 ft - 0.020 slot SCH 40 PVC

JACOBS®

PROJECT NUMBER:	BORING NUMBER:	
704758CH.05.06.FI	NBKK-S7-MW01	SHEET 2 OF 2

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 261189.11 ft, E 1201288.03 ft | ELEVATION: 13.69 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 10.7 ft bgs | START: 10/28/22 09:55 | END: 10/28/22 16:50 | LOGGER: I. Dinkelman, G. Riley

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
			SILTY SAND WITH GRAVEL (SM) Greenish Gray (10Y 5/1), Wet, Fine to Coarse Grained, Angular to Subangular Sand with Silt, and Fine to Coarse Grained, Subangular Gravel, Little Clay. Some shell fragments scattered abundantly throughout.			
			CLAYEY SAND WITH GRAVEL (SC) Wet, Fine to Coarse Grained, Angular to Subangular Sand with Clay, and Fine to Coarse Grained, Subangular Gravel, Little Silt.			
25	8					
			SILTY SAND (SM) Gray (5/N), Moist, Dense, Poorly Graded, Cohesive, Moderately to Well Cemented, Fine to Medium Grained, Angular to Subangular Sand With Silt, and Fine Grained, Subangular Gravel, Little Clay.			
30			Bottom of Boring at 30.00 ft bgs on 10/28/22 16:50			Backfill: 29-30 ft - 12/20 washed silica
35						
40						

JACOBS

PROJECT NUMBER:	BORING NUMBER:	
704758CH.05.06.FI	NBKK-S7-MW02	SHEET 1 OF 2

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 261188.70 ft, E 1201697.48 ft | ELEVATION: 15.54 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 11.3 ft bgs | START: 10/27/22 11:10 | END: 10/28/22 08:00 | LOGGER: I. Dinkelman, G. Riley

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
0			**SILTY SAND WITH GRAVEL (SM)** Brown (10YR 5/3), Dry, Loose to Very Loose, Fine to Coarse Grained, Angular to Subangular Sand with Silt, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Trace Clay.		PID= 0.0 (ppm) 11:25 Collected NBKK-S7-SS02-0001 on 10/27	Monument - Flush mount and concrete
5	5		**SILTY GRAVEL WITH SAND (GM)** Pale Brown (10YR 6/3), Dry, Loose, Fine to Coarse Grained, Subangular to Subrounded Gravel with Silt, and Fine to Coarse Grained, Angular to Subangular Sand, Little Clay.		13:10 Hand auger to 3.0'. Air knife to 6.0'. This is same material sampled from 0.0 - 1.0', and pulled with auger from 2.0-3.0' bgs. Air knife to 6.0' and in core sleeves from 6.0-7.0'	Seal - Hydrated 3/8 bentonite chips
10	5.5		**SILTY SAND WITH GRAVEL (SM)** Dark Gray (5Y 4/1), Wet, Loose, Medium Dense, Fine to Coarse Grained, Angular to Subangular Sand, with Silt, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Trace Clay. Kettle shell fragments scattered throughout core sample.		15:15 Collected NBK-S7-SB02-1011 from 10'-11'. Bottom not recovered. Very loose material not staying in core barrel sampler.	
15			**WELL-GRADED SAND WITH SILT AND GRAVEL (SW-SM)** Grayish Brown (2.5Y 5/2), Wet, Loose, Fine to Coarse Grained, Angular to Subangular Sand, with Silt, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Trace Clay. Exact lithology from 15.5-20.0' is unknown. Little shell fragments observed.			Filter sand pack - 12/20 washed silica Screen 9-29 ft - 0.020 slot SCH 40 PVC
20						

JACOBS®

PROJECT NUMBER:	BORING NUMBER:	
704758CH.05.06.FI	NBKK-S7-MW02	SHEET 2 OF 2

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 261188.70 ft, E 1201697.48 ft | ELEVATION: 15.54 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 11.3 ft bgs | START: 10/27/22 11:10 | END: 10/28/22 08:00 | LOGGER: I. Dinkelman, G. Riley

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
25	7.5		**SILTY GRAVEL WITH SAND (GM)** Light Yellowish Brown (2.5Y 6/3), Wet, Loose, Fine to Coarse Grained, Subangular to Subrounded Gravel, with Silt, and Fine to Coarse Grained, Angular to Subangular Sand, Little Clay. Very wet loose top 6.0" silty sand with gravel. Shell fragments scattered throughout, With higher concentration of shell from 24.0-26.0'.			
			CLAYEY SAND WITH GRAVEL (SC) Gray (5/N), Wet, Medium Dense, Fine to Coarse Grained, Angular to Subangular Sand with Clay, and Fine to Coarse Grained, Subangular Gravel, Little Silt. Abundant shell fragments.			
30			**SANDY LEAN CLAY WITH GRAVEL (CL)** Wet, Stiff, Low to Medium Plasticity Clay with Fine to Coarse Grained, Angular to Subangular Sand, and Fine to Coarse Grained, Subangular Gravel, Little Silt. Shells Scattered.			Backfill: 29-30 ft - 12/20 washed silica
			Bottom of Boring at 30.00 ft bgs on 10/28/22 08:00			
35						
40						

JACOBS

PROJECT NUMBER:	BORING NUMBER:	
704758CH.05.06.FI	NBKK-S7-MW04	SHEET 1 OF 2

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 260906.72 ft, E 1201287.80 ft | ELEVATION: 16.08 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 10.8 ft bgs | START: 10/25/22 09:10 | END: 10/26/22 08:45 | LOGGER: I. Dinkelman, G. Riley

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
			Hand Augered and Air Knifed; soil not logged		PID= 0.0 (ppm)	Monument - Flush mount and concrete
					9:20 Collected NBKK-S7-SS04-0102 on 10/25/22	
5						Seal - Hydrated 3/8 bentonite chips
	4		**SILTY SAND (SM)** Olive Brown (2.5Y 4/3), Moist, Loose, Very Stiff, Fine to Coarse Grained, Subangular Sand with Silt, and Trace Fine to Coarse Grained, Subangular to Subrounded Gravel, Trace Clay. Few shell fragments.		During Hand auger to 5.5', encountered asphalt, debris, flagging tape and other fill materials. At 5.5' had refusal to continue auger to 6.0' from 5.5-6.5 observed Concrete block. Likely fill to 10.0'.	
10					15:15 Collected NBKK-S7-SB04-0910 on 10/25/22	
			SILTY SAND (SM) Dark Greenish Gray (5GY 3/1), Moist, Loose, Medium Dense, Fine to Coarse Grained, Subangular Sand with Silt, and Trace Fine Grained, Angular to Subangular Gravel, Trace Clay. Few Lean clay lens at ~11.0'. Few shell fragments.			
			SILTY SAND WITH GRAVEL (SM) Dark Greenish Gray (10Y 3/1), Wet, Loose, Fine to Coarse Grained, Subangular Sand with Silt, and Fine to Coarse Grained, Subangular Gravel, Little Clay. Little shell fragments observed.			Filter sand pack - 12/20 washed silica
	8.5		**SILTY SAND WITH GRAVEL (SM)** Dark Greenish Gray (10GY 3/1), Wet, Fine to Coarse, Angular to Subangular Sand, with Silt, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Little Clay, At ~ 14.5' a cohesive layer of gravel and some shell fragments in a silty matrix. At ~16.5' to 17.0' few cobbles up to 4.0" diameter. Shell fragments throughout.			Screen 9-19 ft - 0.020 slot SCH 40 PVC
15						
			No Recovery			
20						

JACOBS®

PROJECT NUMBER:	BORING NUMBER:	
704758CH.05.06.FI	NBKK-S7-MW04	SHEET 2 OF 2

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 260906.72 ft, E 1201287.80 ft | ELEVATION: 16.08 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 10.8 ft bgs | START: 10/25/22 09:10 | END: 10/26/22 08:45 | LOGGER: I. Dinkelman, G. Riley

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
	6		**SANDY FAT CLAY WITH GRAVEL (CH)** Greenish Gray (5GY 5/1), Moist, Very Stiff, High Plasticity Clay with Fine to Medium Grained, Subangular Sand, and Little Fine to Coarse Grained, Subangular to Subrounded Gravel, Little silt. **Moist Organic layer. Wood. Highly weathered.** **FAT CLAY WITH SAND (CH)** Dark Gray (4/N), Moist, Stiff to Very Stiff, Slow Dilatancy, High Plasticity, with Fine Grained Sand. Alternating beds of sandy fat clay and sandy silt.			Backfill: 19-25 ft - 12/20 washed silica
25			Bottom of Boring at 25.00 ft bgs on 10/26/22 08:45			
30						
35						
40						

JACOBS

PROJECT NUMBER:	BORING NUMBER:	
704758CH.05.06.FI	NBKK-S7-MW05	SHEET 1 OF 2

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 260890.16 ft, E 1201900.37 ft | ELEVATION: 15.68 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 10.8 ft bgs | START: 10/26/22 11:40 | END: 10/27/22 09:25 | LOGGER: I. Dinkelman, G. Riley

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
			Hand Augered and Air Knifed; soil not logged		PID= 0.0 (ppm) 11:45 Collected NBKK-S7-SS05-0102 on 10/26/22	Monument - Flush mount and concrete
5						Seal - Hydrated 3/8 bentonite chips
	5		**SILTY GRAVEL WITH SAND (GM)** Dark Grayish Brown (10YR 4/2), Moist, Fine to Coarse Grained, Subangular to Subrounded Gravel with Silt, and Fine to Coarse Grained, Angular to Subangular Sand, Little Clay. Top 1.0' likely slough from top during Hand auger. More Well graded sand with gravel.		Hand auger to 3 ft bgs, air knife to 6 ft bgs 14:20 Collected NBKK-S7-SB05-0910 on 10/26/22	
10			**CLAYEY SAND WITH GRAVEL (SC)** Dark Gray (2.5Y 4/1), Wet, Loose, Medium Dense, Fine to Coarse Grained, Angular Sand with Clay, and Fine to Coarse Grained, Subangular Gravel, Few Silt. Little Shell fragments observed.			
			SILTY SAND WITH GRAVEL (SM) Dark Grayish Brown (2.5Y 4/2), Wet, Loose, Fine to Coarse Grained, Subangular Sand with Silt, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Little Clay.			
15	9		**WELL GRADED GRAVEL WITH SILT AND SAND (GW-GM)** Very Dark Grayish (2.5Y 3/2), Wet, Loose, Fine to Coarse Grained, Subangular Gravel with Fine to Coarse Grained, Angular to Subangular Sand and Little Silt, Little Clay.			
			LEAN CLAY WITH SAND (CL) Dark Grayish Brown (10YR 4/2), Moist, Stiff to Very Stiff, High Plasticity Clay with Fine to Medium Grained, Subangular Sand. Top three inches organic. Highly weathered strong rotten smell, decaying organics, Dark Brown (10YR 3/3).			
			CLAYEY SAND (SC) Dark Gray (4/N), Wet, Medium Dense to Dense, Fine to Coarse Grained, Subangular Sand with Clay, and Silt. Few organics with moderate H2S odor.			Filter sand pack - 12/20 washed silica Screen 9-29 ft - 0.020 slot SCH 40 PVC
20						

JACOBS®

PROJECT NUMBER:	BORING NUMBER:	
704758CH.05.06.FI	NBKK-S7-MW05	SHEET 2 OF 2

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 260890.16 ft, E 1201900.37 ft | ELEVATION: 15.68 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 10.8 ft bgs | START: 10/26/22 11:40 | END: 10/27/22 09:25 | LOGGER: I. Dinkelman, G. Riley

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
			WELL GRADED SAND WITH SILT (SW-SM) Dark Greenish Black (10Y 4/1), Wet, Loose, Fine to Coarse Grained, Subangular Sand with Silt and Trace Clay.			
			WELL GRADED GRAVEL WITH SILT AND SAND (GW-GM) Dark Gray (4/N), Wet, Loose, Medium Dense, Fine to Coarse Grained, Subangular to Subrounded Gravel with Silt, and Fine to Coarse Grained, Angular to Subangular Sand, Trace Clay.			
			SILTY SAND WITH GRAVEL (SM) Dark Gray (2.5Y 4/1), Wet, Loose, Medium Dense, Fine to Coarse Grained, Angular to Subangular Sand with Silt, and Fine to Coarse Grained, Subangular Gravel, Little Clay.			
			SILTY GRAVEL WITH SAND (GM) Dark Gray (4/N), Wet, Loose, Medium Dense, Fine to Coarse Grained, Subangular Gravel, with Silt, and Fine to Coarse Grained, Angular to Subangular Sand, Little Clay.			
25	9		**SILTY SAND WITH GRAVEL (SM)** Wet, Loose, Medium Dense, Fine to Coarse Grained, Angular to Subangular Sand with Silt, and Fine to Coarse Grained, Subangular Gravel, Trace Clay.			
			SILTY SAND WITH GRAVEL (SM) Reddish Brown (5YR 4/4), Wet, Loose, Fine to Coarse Grained, Angular to Subangular Sand, with Silt, and Fine to Coarse Grained, Subangular Gravel, Trace Clay.			Backfill: 29-30 ft - 12/20 washed silica
30			Bottom of Boring at 30.00 ft bgs on 10/27/22 09:25			
35						
40						

JACOBS

PROJECT NUMBER:	BORING NUMBER:
704758CH.05.06.FI	NBKK-LFEX-MW01 SHEET 1 OF 2

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 260152.47 ft, E 1199596.28 ft | ELEVATION: 24.55 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 11.74 ft bgs | START: 10/4/22 14:35 | END: 10/7/22 10:30 | LOGGER: I. Dinkelman, G. Riley

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
			SILTY SAND WITH GRAVEL (SM) Light Olive Brown (2.5Y 5/3), Moist, Loose, Fine to Coarse Grained, Angular Sand with Silt, and Fine to Coarse Grained, Angular to Subangular Gravel, Trace Clay. Few organic roots and grasses.		PID= 0.0 (ppm) 14:35 Collected on NBKK-LFEX-SS01-0001 on 10/4/22	Monument - Flush mount and concrete
5	6		**SILTY SAND (SM)** Dark Gray (5Y 4/1), Moist, Medium Dense to Dense, Stiff, Fine to Medium Grained, Subangular Sand, with Silt, and Trace Fine Grained, Angular to Subangular Gravel, Little Clay.		Hand auger to 3.0 ft bgs, Air knife to 6.0 ft bgs	
10	9		**WELL GRADED SAND WITH SILT (SW-SM)** Olive Gray (5Y 4/2), Wet, Loose, Fine to Coarse Grained, Angular to Subangular Sand, with Silt, and Trace Fine Grained Subangular Gravel, Trace Clay. **SILTY SAND (SM)** Dark Grayish Brown (2.5Y 4/2), Moist, Medium Dense to Dense, Fine to Medium Grained, Angular to Subangular Sand, with Silt, and Trace Fine Grained, Subangular Gravel, Fine Grained, Little Clay. **SILTY SAND WITH GRAVEL (SM)** Moist, Medium Dense, Fine to Medium Grained, Subangular Sand, with Silt, and Fine to Coarse Grained, Subangular Gravel, Trace Clay. **FAT CLAY (CH)** Dark Gray (4/N), Moist, Very Stiff Clay, with Trace Fine to Medium Grained Sand. **CLAYEY SAND (SC)** Very Dark Gray (5Y 3/1), Moist, Medium Dense, Fine to Coarse Grained, Angular to Subangular Sand, with Clay, and Trace Fine to Coarse Grained, Subangular Gravel, Little Silt.			Seal - Hydrated 3/8 bentonite chips
15						
20						

JACOBS

PROJECT NUMBER:	BORING NUMBER:	
704758CH.05.06.FI	NBKK-LFEX-MW01	SHEET 2 OF 2

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 260152.47 ft, E 1199596.28 ft | ELEVATION: 24.55 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 11.74 ft bgs | START: 10/4/22 14:35 | END: 10/7/22 10:30 | LOGGER: I. Dinkelman, G. Riley

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
25	8		**WELL GRADED SAND WITH SILT (SW-SM)** Very Dark Gray (3/N), Wet, Loose, Fine to Coarse Grained, Subangular Sand, with Silt, and Trace Fine Grained, Angular Gravel, Trace Clay. **FAT CLAY (CH)** Moist, Very Stiff, High Plasticity Clay. At 21.0' and 28.5' thin layers of interbedded organic "stringers".		14:10 Water observed coming out of core barrel, but no significant water bearing zone observed in core sample lithology	
30					16:20 Collected NBKK-LFEX-SB01-2728 on 10/6/22	
			SILTY SAND (SM) Wet, Loose, Rapid Dilatancy, Non Plastic, Poorly Graded, Medium Grained, Angular to Subangular Sand, with Silt, and Fine Grained Gravel, Trace Clay.			
35	8		**WELL GRADED SAND WITH SILT (SW-SM)** Black (2.5/N), Wet, Loose, Fine to Coarse Grained, Angular to Subangular Sand, with Silt, and Trace Fine Grained, Angular to Subangular Gravel, Trace Clay.			Filter sand pack - 12/20 washed silica Screen 29-39 ft - 0.20 slot SCH 40 PVC
			SILTY SAND (SM) Wet, Medium Dense to Dense, Poorly Graded, Fine Grained, Subangular Sand, with Silt, Little Clay.			
40			**FAT CLAY (CH)** Very Dark Gray (3/N), Moist, Dense, Very Stiff, High Plasticity Clay, with Fine Grained, Subangular Sand, and Little Silt.			Backfill: 39-40 ft - 12/20 washed silica

Bottom of Boring at 40.00 ft bgs on 10/7/22 10:30

JACOBS

PROJECT NUMBER:	BORING NUMBER:	
704758CH.05.06.FI	NBKK-LFEX-MW02	SHEET 1 OF 2

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 259980.32 ft, E 1199382.73 ft | ELEVATION: 21.98 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 10.89 ft bgs | START: 10/4/22 12:10 | END: 10/5/22 16:30 | LOGGER: I. Dinkelman, G. Riley

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
			SILTY SAND (SM) Light Olive Brown (2.5Y 5/4), Moist, Loose to Medium Dense, Fine to Coarse Grained, Subangular to Subrounded Sand, with Silt, and Fine to Coarse Grained, Angular to Subangular Gravel, Trace Clay.		PID= 0.0 (ppm) 14:05 Collected NBKK-LFEX-SS02-0001 on 10/3/22	Monument - Flush mount and concrete
5	6		**SILTY SAND WITH GRAVEL (SM)** Olive Brown (2.5Y 4/3, Moist, Medium Dense, Fine to Coarse Grained, Angular to Subangular Sand, with Silt, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Little Clay. Gravel up to 3.0" diameter with trace cobbles up to 4.0".		12:10 Hand Auger to 3.0, for sample collection. Air knife to 5.2'.	
			FAT CLAY (CH) Dark Gray (5Y 4/1), Dry, Stiff to Very Stiff, High Plasticity Clay with Little Silt.			
10			**FAT CLAY (CH)** Dark Gray (4/N), Moist, Very Stiff, High Plasticity Clay with Little Fine Grained Sand, and Little Silt.			Seal - Hydrated 3/8 bentonite chips
			POORLY GRADED SAND WITH SILT (SP-SM) Very Dark Gray (3/N), Wet, Medium Dense, Medium Grained, Angular to Subangular Sand, with Silt, and Fine Grained Gravel, Trace Clay.			
15	10		**FAT CLAY (CH)** Very Dark Gray (3/N), Moist, Dense, Very Stiff, High Plasticity Clay. At ~ 18.5' in breaks of clay, there is a thin layer of wood/organic deposition.			
20						

JACOBS

PROJECT NUMBER:	BORING NUMBER:
704758CH.05.06.FI	NBKK-LFEX-MW02 SHEET 2 OF 2

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 259980.32 ft, E 1199382.73 ft | ELEVATION: 21.98 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 10.89 ft bgs | START: 10/4/22 12:10 | END: 10/5/22 16:30 | LOGGER: I. Dinkelman, G. Riley

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
			ELASTIC SILT (MH) Very Dark Gray (2.5Y 3/1), Moist, Medium Dense to Dense, Stiff, Low to Medium Plasticity, with Trace Sand, and Little Clay.		14:25 Collected NBKK-LFEX-SB02-2122 on 10/4/22	Filter sand pack - 12/20 washed silica
			ELASTIC SILT WITH SAND (MH) Moist, Dense, Very Stiff, Medium Plasticity Silt with Medium Grained, Angular to Subangular Sand, and Fine Grained Gravel, Little Clay.			Screen 18-28 ft - 0.020 slot SCH 40 PVC
25	10		**WELL GRADED SAND WITH SILT (SW-SM)** Black (2.5/N), Wet, Loose, Medium to Coarse Grained, Angular to Subangular Sand, with Silt, and Fine to Medium Grained Gravel, Trace Clay. From 23.0-24.0 more silt and a silty sand (SM) transitioning to the well graded sand with silt.			
			FAT CLAY (CH) Very Dark Gray (3/N), Moist, Very Stiff, High Plasticity Clay.			Backfill: 28-30 ft - 12/20 washed silica
30			Bottom of Boring at 30.00 ft bgs on 10/5/22 16:30			
35						
40						

JACOBS

PROJECT NUMBER:	BORING NUMBER:	
704758CH.05.06.FI	NBKK-LFEX-MW03	SHEET 1 OF 2

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 259906.27 ft, E 1199545.80 ft | ELEVATION: 20.13 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 11.5 ft bgs | START: 10/3/22 09:00 | END: 10/5/22 17:15 | LOGGER: I. Dinkelman, G. Riley

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
			CLAYEY SAND WITH GRAVEL (SC) Very Dark Grayish (2.5Y 3/2), Moist, Medium Dense, Fine to Coarse Grained, Subangular Sand, with Clay, and Fine to Coarse Grained, Subangular to Subrounded Gravel, Few Clay.		PID= 0.0 (ppm) 10:00 Collected NBKK-LFEX-SS03-0102 on 10/3/22	Monument - Flush mount and concrete
			No Recovery			
5			**SILTY SAND WITH GRAVEL (SM)** Very Dark Grayish Brown (10YR 3/2), Moist, Loose, Medium Dense, Fine to Coarse Grained, Angular to Subangular Sand, with Silt, and Fine to Coarse Grained, Angular to Subangular Gravel, Little Clay.		Asphalt cut 2' x 2' pad. Air-knife/Hand auger for utility clearance. Fill material. Wood and metal debris observed. Small shell fragments identified at 3.0' bgs. Fill material from 0.25-7.0' air knife/Hand auger for utility clearance from 0.25-6.0'. Observed debris including metal and wood in core samples. 14:50 Collected NBKK-LFEX-SB03-0708 on 10/3/22	
	4		**FAT CLAY (CH)** Greenish Gray (10Y 5/1), Moist, Dense to Very Dense, Very Stiff, High Plasticity Clay with Trace Fine Grained Sand, Little Alternating bands of color.			
10			**SANDY FAT CLAY WITH GRAVEL (CH)** Light Olive Brown (2.5Y 5/3), Moist, Dense to Very Dense, Very Stiff, Hard, High Plasticity Clay with Fine to Medium Grained, Angular to Subangular Sand and Fine to Coarse Grained, Subangular to Subrounded Gravel. At ~ 9.25' gravel up to 2.5" diameter observed. From 8-9.25' no gravel.		From 10.75 - 11.5 sand 'stringer' wet. Well graded sand with some fine gravels. Likely not predominant WBZ. 5Y 4/1. At ~ 16.0-16.5' may be old organic layer thin "laminae" wood. GLEY 1 2.5/N Black.	Seal - Hydrated 3/8 bentonite chips
			Large rock, Quartzite.			
			FAT CLAY WITH SAND (CH) Very Dark Gray (2.5Y 3/1), Moist, Dense, Stiff, High Plasticity Clay with Fine to Coarse Grained, Angular to Subangular Sand.			
15	10				14:55 Collected NBKK-LFEX-SB03-1718 on 10/3/22	
20						

JACOBS

PROJECT NUMBER:	BORING NUMBER:
704758CH.05.06.FI	NBKK-LFEX-MW03 SHEET 2 OF 2

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 259906.27 ft, E 1199545.80 ft | ELEVATION: 20.13 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 11.5 ft bgs | START: 10/3/22 09:00 | END: 10/5/22 17:15 | LOGGER: I. Dinkelman, G. Riley

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
			WELL GRADED SAND WITH SILT (SW-SM) Very Dark Gray (3/N), Wet, Loose, Fine to Coarse Grained, Angular to Subangular Sand, with Silt, and Trace Fine Grained, Angular to Subangular Gravel, Trace Clay. 20-21 color lighter and more silt bordering a silty sand. 21-24.5 transition to less silt.			Filter sand pack - 12/20 washed silica
25	10		**FAT CLAY (CH)** Very Dark Gray (5Y 3/1), Moist, Dense to Very Dense, Very Stiff, High Plasticity Clay with Trace Fine Grained, Subrounded Sand. From ~28.75-29.0' observe thin layer of organic (wood) and "blue precipitate" GLEY 2 7/10B.			Screen 19.5-29.5 ft - 0.020 slot SCH 40 PVC
30						
			FAT CLAY (CH) Very Stiff, Hard, High Plasticity Clay with Trace Fine Grained Sand, Trace Silt.			
35	7.5					Backfill: 29.5-40 ft - 12/20 washed silica
40						

Bottom of Boring at 40.00 ft bgs on 10/5/22 17:15

JACOBS

PROJECT NUMBER:	BORING NUMBER:	
704758CH.05.06.FI	NBKK-LFEX-MW04	SHEET 1 OF 2

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 259915.48 ft, E 1199818.02 ft | ELEVATION: 23.27 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

WATER LEVEL: 13.15 ft bgs | START: 10/7/22 11:40 | END: 10/8/22 08:10 | LOGGER: I. Dinkelman, G. Riley

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
	3		**SILTY SAND WITH GRAVEL (SM)** Brown (10YR 4/3), Moist, Loose, Fine to Coarse Grained, Angular to Subangular Sand, with Silt, and Fine to Coarse Grained, Angular Gravel up to 2.0" diameter, Little Clay, Few organics. Roots and grasses.		PID= 0.0 (ppm) Hand Auger to 3.0 ft bgs. 17:05 Collected NBKK-LFEX-SS04-0001 on 10/4/22	Monument - Flush mount and concrete
5			**SILTY SAND WITH GRAVEL (SM)** Yellowish Brown (10YR 5/4), Moist, Fine to Coarse Grained, Subangular Sand, with Silt, and Fine to Coarse Grained, Subangular to Subrounded Gravel up to 3.0 Diameter, Few Clay. Border on SM/SC.		Air knife to 6.0 ft bgs	
10			**SANDY FAT CLAY WITH GRAVEL (CH)** Dark Olive Gray (5Y 3/2), Moist Clay with Gravel up to 2.5" in Diameter.			Seal - Hydrated 3/8 bentonite chips
15	10		**CLAYEY SAND WITH GRAVEL (SC)** Dark Gray (5Y 4/1), Moist, Well Graded, Fine to Coarse Grained, Angular to Subangular Sand with Clay, and Fine to Coarse Grained, Angular to Subangular Gravel up to 3.0 in Diameter, Little Silt. Cobble up to 4.0" diameter subangular. Grey clayey sand is interbedded with a darker clayey sand with gravel. Moist to wet.			
			FAT CLAY (CH) Dark Gray (2.5Y 4/1), Moist, Very Stiff, High Plasticity Clay.			
20			**SILTY SAND (SM)** Dark Greenish Gray (10Y 2.5/1), Moist, Dense, Poorly Graded, Fine Grained, Subrounded Sand with Silt, Little Clay.			

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PROJECT NUMBER:	BORING NUMBER:
704758CH.05.06.FI	NBKK-LFEX-MW04 SHEET 2 OF 2

SOIL BORING LOG

PROJECT: Keyport Site Inspection For PFAS | LOCATION: NUWC Division Keyport

COORDINATES: N 259915.48 ft, E 1199818.02 ft | ELEVATION: 23.27 ft NAVD88

DRILLING CONTRACTOR: Yellow Jacket | DRILLING METHOD AND EQUIPMENT: Terrasonic 150CC, 6-in casing with 4-in core barrel

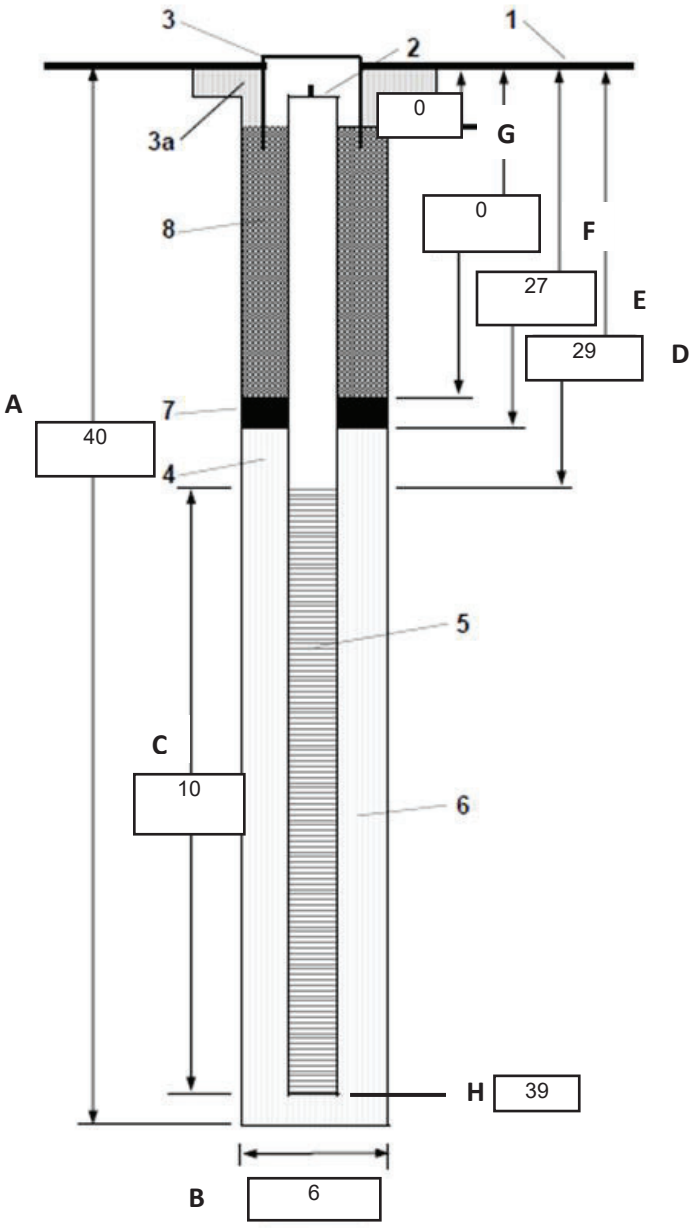
WATER LEVEL: 13.15 ft bgs | START: 10/7/22 11:40 | END: 10/8/22 08:10 | LOGGER: I. Dinkelman, G. Riley

DEPTH BELOW GROUND SURFACE (FT)	INTERVAL / RECOVERY (FT)	CORE ID	SOIL DESCRIPTION: Soil name, USCS, Color, Description	GRAPHIC LOG	COMMENTS	WELL DETAILS
25	10		**WELL-GRADED SAND WITH SILT AND GRAVEL (SW-SM)** Black (2.5/N), Wet, Loose, Fine to Coarse Grained, Angular to Subangular Sand with Silt, and Fine Grained, Angular Gravel, Trace Clay. **FAT CLAY (CH)** Gray (5Y 5/1), Moist, Stiff to Very Stiff, High Plasticity Clay. At ~ 22.0' thin interbedded wood layer.			
			SANDY FAT CLAY (CH) Black (5Y 2.5/1), Moist, Stiff to Very Stiff, High Plasticity Clay with Fine to Medium Grained, Subangular Sand, Little Silt.		15:20 Collected NBKK-LFEX-SB04-2627 on 10/7/22	
30			**WELL-GRADED SAND WITH SILT AND GRAVEL (SW-SM)** Wet, Loose, Fine to Coarse Grained, Angular to Subangular Sand with Trace Silt, and Fine Grained, Angular Gravel, Little Clay.			Filter sand pack - 12/20 washed silica Screen 23-33 ft - 0.020 slot SCH 40 PVC
	6		**FAT CLAY WITH SAND (CH)** Dark Gray (4/N), Moist, Stiff to Very Stiff, Slow Dilatancy, High Plasticity Clay with Fine Grained Sand.			
35						Backfill: 33-36 ft - 12/20 washed silica
			Bottom of Boring at 36.00 ft bgs on 10/8/22 08:10			
40						

Jacobs	PROJECT NUMBER: 704758CH.05.06.FI	WELL NUMBER: NBKK-B76-MW01
	WELL COMPLETION DIAGRAM	

PROJECT: Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington
INSTALLATION: KEYPORT_NUWC
SITE: Building 76
LOGGER: Ilka Dinkelman, Jordan Peery Lemon, Camden Corio
DRILLING CONTRACTOR: Holt Drilling
DRILLER NAME: Quaid Curtis

DRILLING METHOD AND EQUIPMENT USED: Sonication (Sonic), Terrasonic 150CC
OUTER DIA : 6 (in) **INNER DIA:** 4 (in)
WATER LEVEL: 13.52 (ft bgs)
TOTAL WELL DEPTH: 39 (ft bgs)
START: August 31, 2022 **END:** August 31, 2022



1 – **Ground elevation at well (ft asml):** 44.60

2 – **Top of casing elevation (ft asml)**: 44.35

3 – **Wellhead Cover:** 0 **(ft)**, Steel, Flush Mounted
- a) **Concrete Pad Length (ft**): 2
- b) **Concrete Pad Width (ft):** 2
- c) **Concrete Pad Depth (ft):** .5

4 – **Well Casing (in):** 2" / Schedule 40 PVC

5 – **Well Screen (in):** 0.02" / Factory slotted
Screen Interval (ft): 29 - 39

6/7 – **Type screen filter**: #12/20 silica sand
- a) **Quantity (lbs):** 250

8 – **Type of seal (in):** 3/8" Bentonite Chips
- a) **Quantity (lbs):** 400

9 – **Grout Mixture**: NA
Amount of Cement Used:
- a) **Amount of bentonite used:**
- b) **Amount of water used (gal):**
- c) **Method of placement:**
- d) **Vol. of well casing grout (gal):**

10 – **End Cap**: Schedule 40 PVC, 2" Dia x 4" Long

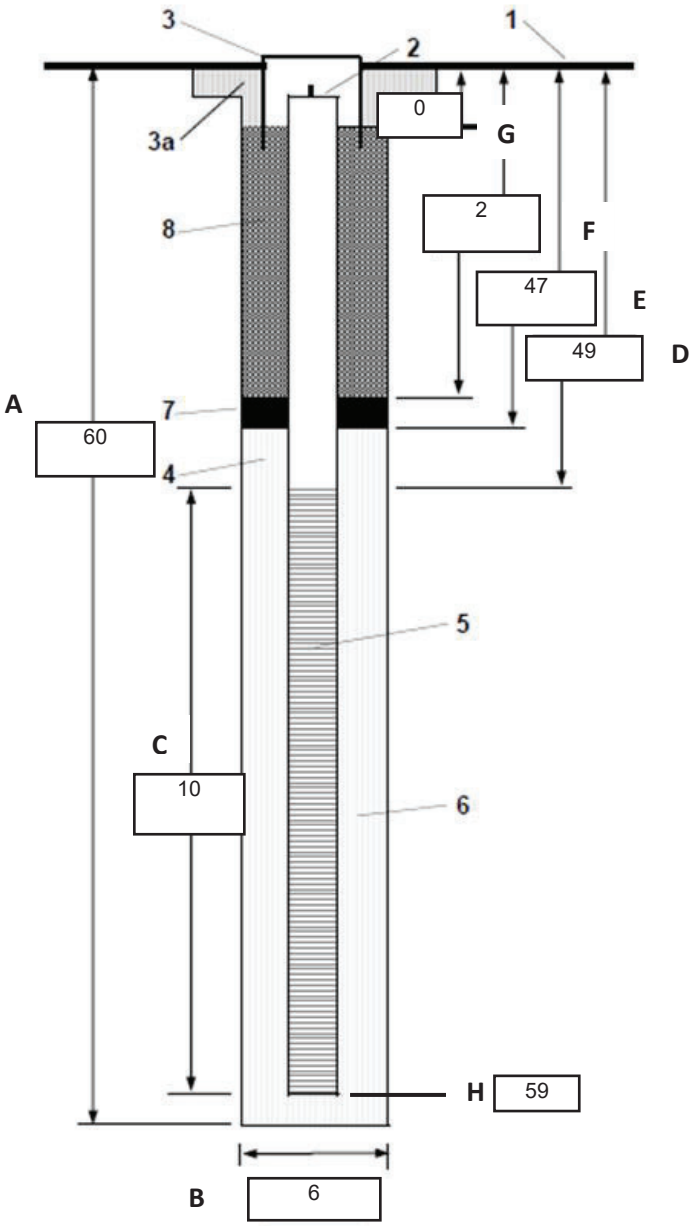
Comments:

A= Boring Depth (feet)
B= Borehole Diameter (inches)
C= Length of Screen (feet)
D= Depth to Top of Screen (feet)
E= Top of Sand Pack (feet)
F= Top of Annular Seal (feet)
G= Top of Grout Seal (feet)
H= Bottom of Screen (feet)

Jacobs	PROJECT NUMBER: 704758CH.05.06.FI	WELL NUMBER: NBKK-B76-MW02
	WELL COMPLETION DIAGRAM	

PROJECT: Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington
INSTALLATION: KEYPORT_NUWC
SITE: Building 76
LOGGER: Ilka Dinkelman, Jordan Peery Lemon, Camden Corio
DRILLING CONTRACTOR: Holt Drilling
DRILLER NAME: Quaid Curtis

DRILLING METHOD AND EQUIPMENT USED: Sonication (Sonic), Terrasonic 150CC
OUTER DIA : 6 (in) **INNER DIA:** 4 (in)
WATER LEVEL: 51 (ft bgs)
TOTAL WELL DEPTH: 59 (ft)
START: September 1, 2022 **END:** September 1, 2022



1 – **Ground elevation at well (ft asml):** 43.45

2 – **Top of casing elevation (ft asml)**: 43.16

3 – **Wellhead Cover:** 0 **(ft)**, Steel, Flush Mounted
a) **Concrete Pad Length (ft**): 2
b) **Concrete Pad Width (ft):** 2
c) **Concrete Pad Depth (ft):** 0.5

4 – **Well Casing (in):** 2" / Schedule 40 PVC

5 – **Well Screen (in):** 0.02" / Factory slotted
Screen Interval (ft): 49 - 59

6/7 – **Type screen filter**: #12/20 silica sand
a) **Quantity:**

8 – **Type of seal (in):** 3/8" chips
a) **Quantity:**

9 – **Grout Mixture**: NA
Amount of Cement Used:
a) **Amount of bentonite used:**
b) **Amount of water used (gal):**
c) **Method of placement:**
d) **Vol. of well casing grout (gal):**

10 – **End Cap**: Schedule 40 PVC, 2" Dia x 4" Long

Comments:

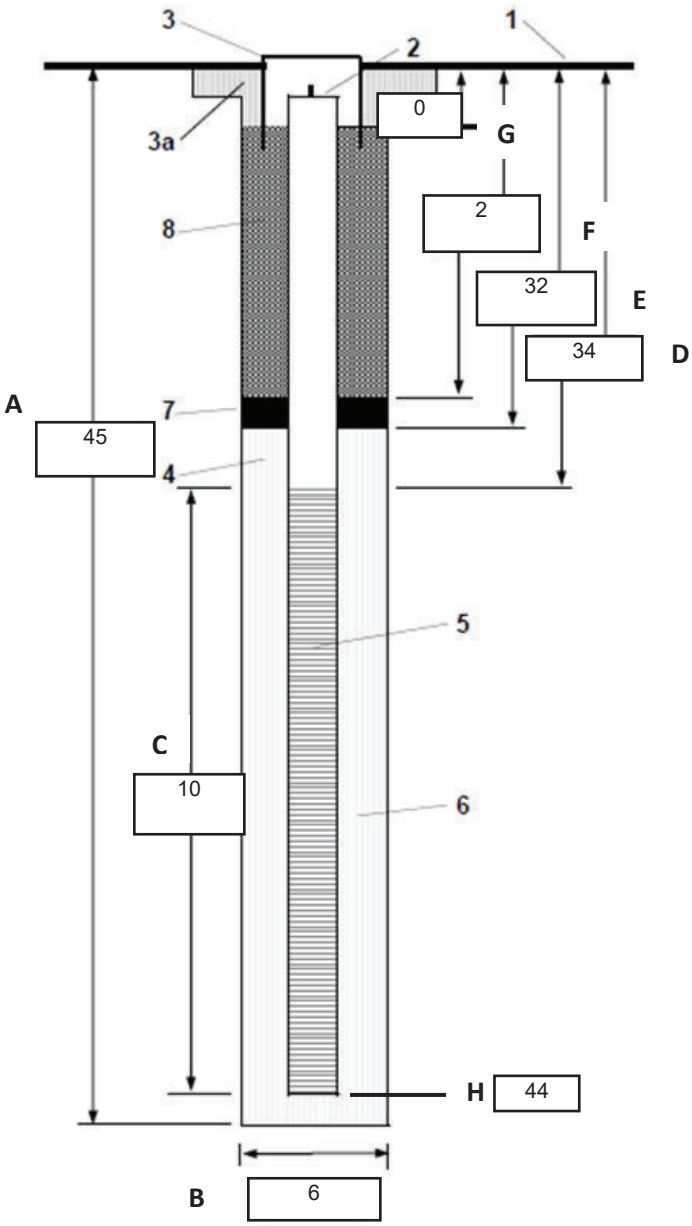
A= Boring Depth (feet)
B= Borehole Diameter (inches)
C= Length of Screen (feet)
D= Depth to Top of Screen (feet)
E= Top of Sand Pack (feet)
F= Top of Annular Seal (feet)
G= Top of Grout Seal (feet)
H= Bottom of Screen (feet)

Jacobs	PROJECT NUMBER: 704758CH.05.06.FI	WELL NUMBER: NBKK-B76-MW03

WELL COMPLETION DIAGRAM

PROJECT: Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington
INSTALLATION: KEYPORT_NUWC
SITE: Building 76
LOGGER: Ilka Dinkelman, Jordan Peery Lemon, Camden Corio
DRILLING CONTRACTOR: Holt Drilling
DRILLER NAME: Quaid Curtis

DRILLING METHOD AND EQUIPMENT USED: Sonication (Sonic), Terrasonic 150CC
OUTER DIA : 6 (in) **INNER DIA:** 4 (in)
WATER LEVEL: 24.85 (ft bgs)
TOTAL WELL DEPTH: 44 (ft bgs)
START: September 2, 2022 **END:** September 2, 2022



1 – **Ground elevation at well (ft asml):** 45.45

2 – **Top of casing elevation (ft asml)**: 45.15

3 – **Wellhead Cover:** 0 **(ft)**, Steel, Flush Mounted
- a) **Concrete Pad Length (ft**): 2
- b) **Concrete Pad Width (ft):** 2
- c) **Concrete Pad Depth (ft):** 0.5

4 – **Well Casing (in):** 2" / Schedule 40 PVC

5 – **Well Screen (in):** 0.02" / Factory slotted
Screen Interval (ft): 34 - 44

6/7 – **Type screen filter**: #12/20 silica sand
- a) **Quantity (lbs):** 200

8 – **Type of seal (in):** 3/8" Bentonite
- a) **Quantity (lbs):** 700

9 – **Grout Mixture**: NA
Amount of Cement Used:
- a) **Amount of bentonite used:**
- b) **Amount of water used (gal):**
- c) **Method of placement:**
- d) **Vol. of well casing grout (gal):**

10 – **End Cap**: Schedule 40 PVC, 2" Dia x 4" Long

Comments:

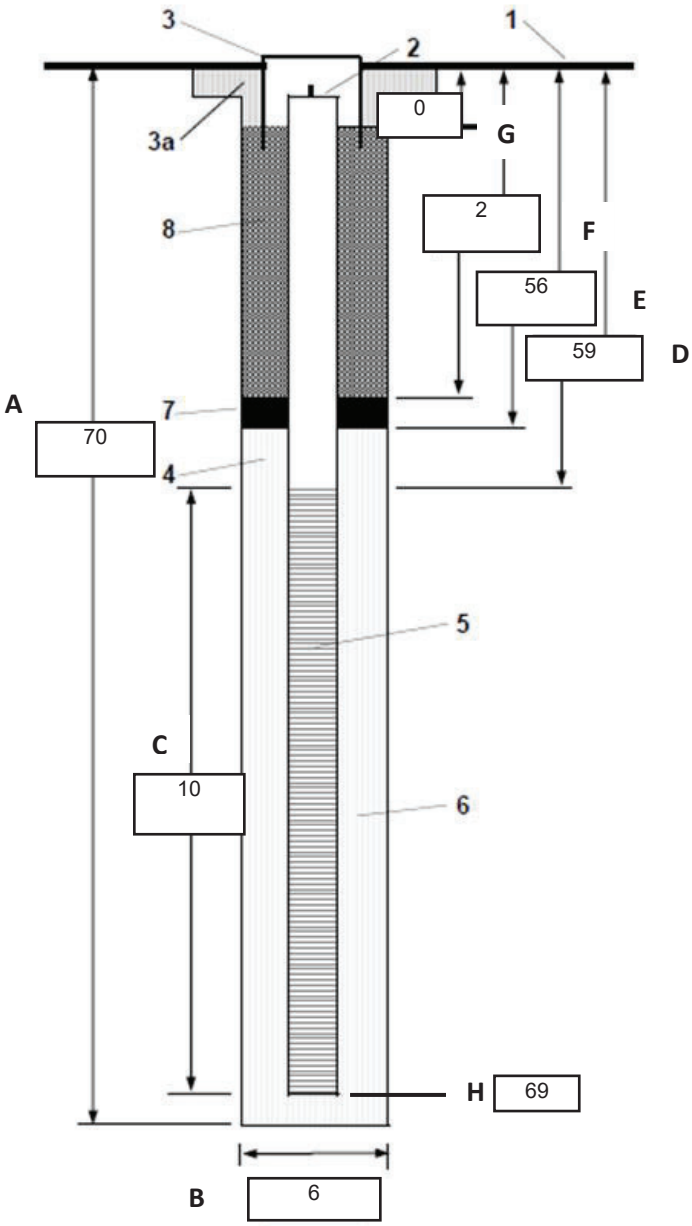
A= Boring Depth (feet)
B= Borehole Diameter (inches)
C= Length of Screen (feet)
D= Depth to Top of Screen (feet)
E= Top of Sand Pack (feet)
F= Top of Annular Seal (feet)
G= Top of Grout Seal (feet)
H= Bottom of Screen (feet)

Jacobs	PROJECT NUMBER: 704758CH.05.06.FI	WELL NUMBER: NBKK-B76-MW04

WELL COMPLETION DIAGRAM

PROJECT: Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington
INSTALLATION: KEYPORT_NUWC
SITE: Building 76
LOGGER: Ilka Dinkelman, Caitlin Dronfield, Jordan Peery Lemon
DRILLING CONTRACTOR: Holt Drilling
DRILLER NAME: Quaid Curtis

DRILLING METHOD AND EQUIPMENT USED: Sonication (Sonic), Terrasonic 150CC
OUTER DIA : 6 (in) **INNER DIA:** 4 (in)
WATER LEVEL: 28.25 (ft bgs)
TOTAL WELL DEPTH: 69 (ft bgs)
START: September 6, 2022 **END:** September 6, 2022



1 – **Ground elevation at well (ft asml):** 53.11

2 – **Top of casing elevation (ft asml)**: 52.87

3 – **Wellhead Cover:** 0 **(ft)**, Steel, Flush Mounted
a) **Concrete Pad Length (ft**): 2
b) **Concrete Pad Width (ft):** 2
c) **Concrete Pad Depth (ft):** 0.5

4 – **Well Casing (in):** 2" / Schedule 40 PVC

5 – **Well Screen (in):** 0.02" / Factory slotted
Screen Interval (ft): 59 - 69

6/7 – **Type screen filter**: #12/20 silica sand
a) **Quantity (lbs):** 100

8 – **Type of seal (in):** 3/8" Bentonite
a) **Quantity (lbs):** 500

9 – **Grout Mixture**: NA
Amount of Cement Used:
a) **Amount of bentonite used:**
b) **Amount of water used (gal):**
c) **Method of placement:**
d) **Vol. of well casing grout (gal):**

10 – **End Cap**: Schedule 40 PVC, 2" Dia x 4" Long

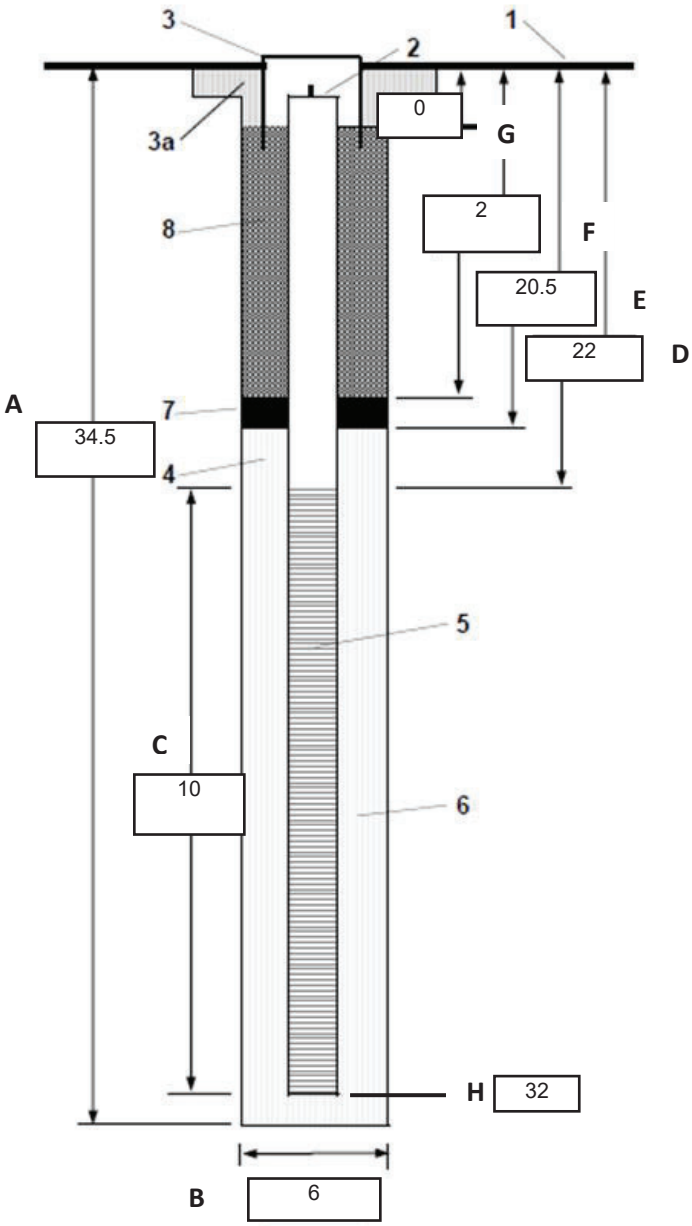
Comments:

A= Boring Depth (feet)
B= Borehole Diameter (inches)
C= Length of Screen (feet)
D= Depth to Top of Screen (feet)
E= Top of Sand Pack (feet)
F= Top of Annular Seal (feet)
G= Top of Grout Seal (feet)
H= Bottom of Screen (feet)

Jacobs	PROJECT NUMBER: 704758CH.05.06.FI	WELL NUMBER: NBKK-B76-MW06
	WELL COMPLETION DIAGRAM	

PROJECT: Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington
INSTALLATION: KEYPORT_NUWC
SITE: Building 76
LOGGER: Lyndsey Kleppin
DRILLING CONTRACTOR: Yellow Jacket
DRILLER NAME: Michael Anderson

DRILLING METHOD AND EQUIPMENT USED: Sonication (Sonic), Terrasonic Rig 150 CC
OUTER DIA: 6 (in) **INNER DIA:** 4 (in)
WATER LEVEL: 11.6 (ft bgs)
TOTAL WELL DEPTH: 32 (ft)
START: August 8, 2023 **END:** August 8, 2023



Single Well Below Ground Surface

1 – **Ground elevation at well:** 43.26

2 – **Top of casing elevation**: 42.99

3 – **Wellhead Cover:** 0 **(ft)**, Steel, Flush Mounted
- a) **Concrete Pad Length (ft**): 2
- b) **Concrete Pad Width (ft):** 2
- c) **Concrete Pad Depth (ft):** 1

4 – **Well Casing (in):** 2 / Schedule 40 PVC

5 – **Well Screen (in):** 0.02 / Factory slotted
Screen Interval (ft): 22 - 32

6/7 – **Type screen filter**: #12/20 silica sand
- a) **Quantity (lbs):** 300

8 – **Type of seal (in):** 3/4”
- a) **Quantity (lbs):** 400

9 – **Grout Mixture**: 0
Amount of Cement Used: 0
- a) **Amount of bentonite used:** 0
- b) **Amount of water used (gal):** 0
- c) **Method of placement:** 0
- d) **Vol. of well casing grout (gal):** 0

10 – **End Cap**: Schedule 40 PVC, 4 **(in)**, Flat

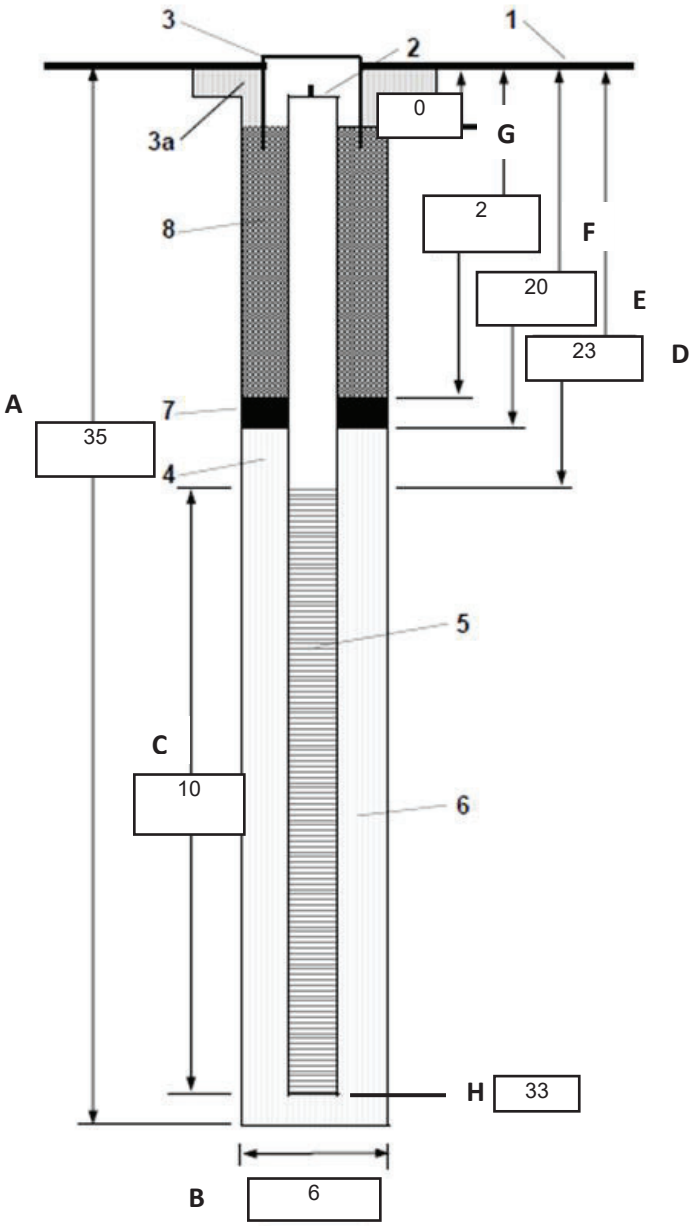
Comments:

A= Boring Depth (feet)
B= Borehole Diameter (inches)
C= Length of Screen (feet)
D= Depth to Top of Screen (feet)
E= Top of Sand Pack (feet)
F= Top of Annular Seal (feet)
G= Top of Grout Seal (feet)
H= Bottom of Screen (feet)

Jacobs	PROJECT NUMBER: 704758CH.05.06.FI	WELL NUMBER: NBKK-B76-MW07
	WELL COMPLETION DIAGRAM	

PROJECT: Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington
INSTALLATION: KEYPORT_NUWC
SITE: Building 76
LOGGER: Lyndsey Kleppin
DRILLING CONTRACTOR: Yellow Jacket
DRILLER NAME: Michael Anderson

DRILLING METHOD AND EQUIPMENT USED: Sonication (Sonic), Terrasonic Rig 150 CC
OUTER DIA: 6 (in) **INNER DIA:** 4 (in)
WATER LEVEL: 14.5 (ft bgs)
TOTAL WELL DEPTH: 33 (ft)
START: August 10, 2023 **END:** August 10, 2023



Single Well Below Ground Surface

1 – **Ground elevation at well:** 50.15

2 – **Top of casing elevation**: 49.92

3 – **Wellhead Cover:** 0 **(ft)**, Steel, Flush Mounted
- a) **Concrete Pad Length (ft**): 2
- b) **Concrete Pad Width (ft):** 2
- c) **Concrete Pad Depth (ft):** 1

4 – **Well Casing (in):** 2 / Schedule 40 PVC

5 – **Well Screen (in):** 0.02 / Factory slotted
Screen Interval (ft): 23 - 33

6/7 – **Type screen filter**: #12/20 silica sand
- a) **Quantity (lbs):** 300

8 – **Type of seal (in):** 3/4”
- a) **Quantity (lbs):** 300

9 – **Grout Mixture**: 0
Amount of Cement Used: 0
- a) **Amount of bentonite used:** 0
- b) **Amount of water used (gal):** 0
- c) **Method of placement:** 0
- d) **Vol. of well casing grout (gal):** 0

10 – **End Cap**: Schedule 40 PVC, 4 **(in)**, Flat

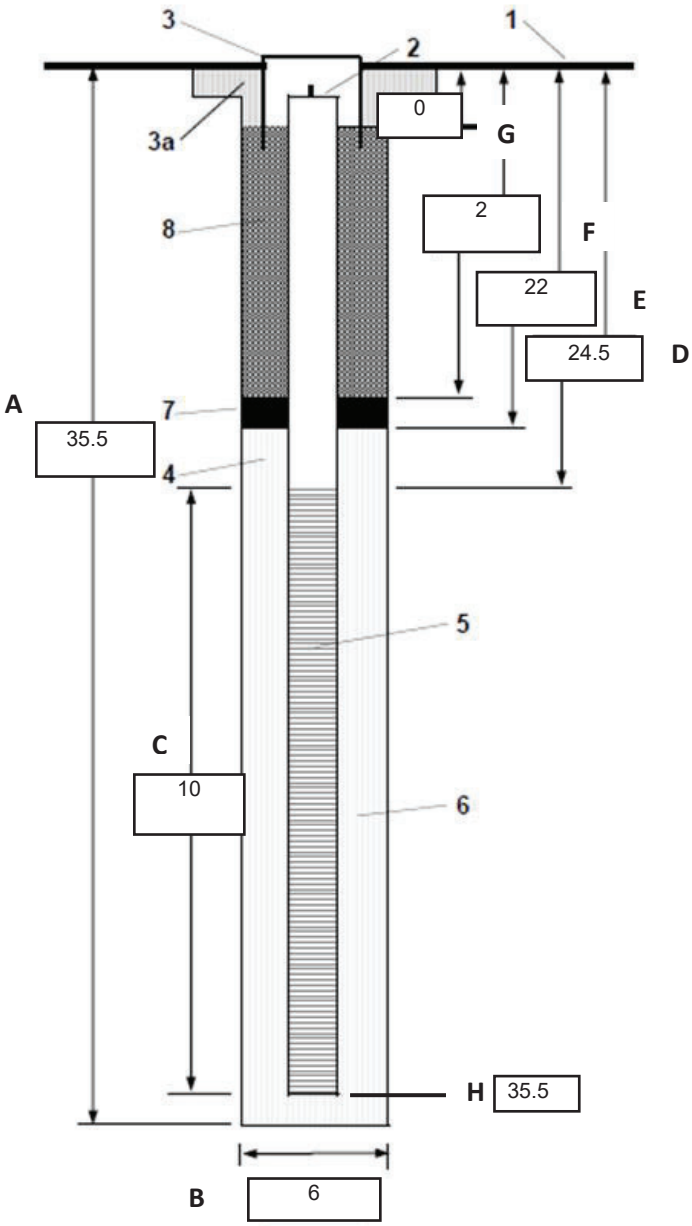
Comments:

A= Boring Depth (feet)
B= Borehole Diameter (inches)
C= Length of Screen (feet)
D= Depth to Top of Screen (feet)
E= Top of Sand Pack (feet)
F= Top of Annular Seal (feet)
G= Top of Grout Seal (feet)
H= Bottom of Screen (feet)

Jacobs	PROJECT NUMBER: 704758CH.05.06.FI	WELL NUMBER: NBKK-B76-MW08
	WELL COMPLETION DIAGRAM	

PROJECT: Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington
INSTALLATION: KEYPORT_NUWC
SITE: Building 76
LOGGER: Lyndsey Kleppin
DRILLING CONTRACTOR: Yellow Jacket
DRILLER NAME: Michael Anderson

DRILLING METHOD AND EQUIPMENT USED: Sonication (Sonic), Terrasonic Rig 150 CC
OUTER DIA: 6 (in) **INNER DIA:** 4 (in)
WATER LEVEL: 16 (ft bgs)
TOTAL WELL DEPTH: 35.5 (ft)
START: August 10, 2023 **END:** August 10, 2023



Single Well Below Ground Surface

1 – **Ground elevation at well:** 54.71

2 – **Top of casing elevation**: 54.37

3 – **Wellhead Cover:** 0 **(ft)**, Steel, Flush Mounted
- a) **Concrete Pad Length (ft**): 2
- b) **Concrete Pad Width (ft):** 2
- c) **Concrete Pad Depth (ft):** 1

4 – **Well Casing (in):** 2 / Schedule 40 PVC

5 – **Well Screen (in):** 0.02 / Factory slotted
Screen Interval (ft): 24.5 - 35.5

6/7 – **Type screen filter**: #12/20 silica sand
- a) **Quantity (lbs):** 450

8 – **Type of seal (in):** 3/4”
- a) **Quantity (lbs):** 300

9 – **Grout Mixture**: 0
Amount of Cement Used: 0
- a) **Amount of bentonite used:** 0
- b) **Amount of water used (gal):** 0
- c) **Method of placement:** 0
- d) **Vol. of well casing grout (gal):** 0

10 – **End Cap**: Schedule 40 PVC, 4 **(in)**, Flat

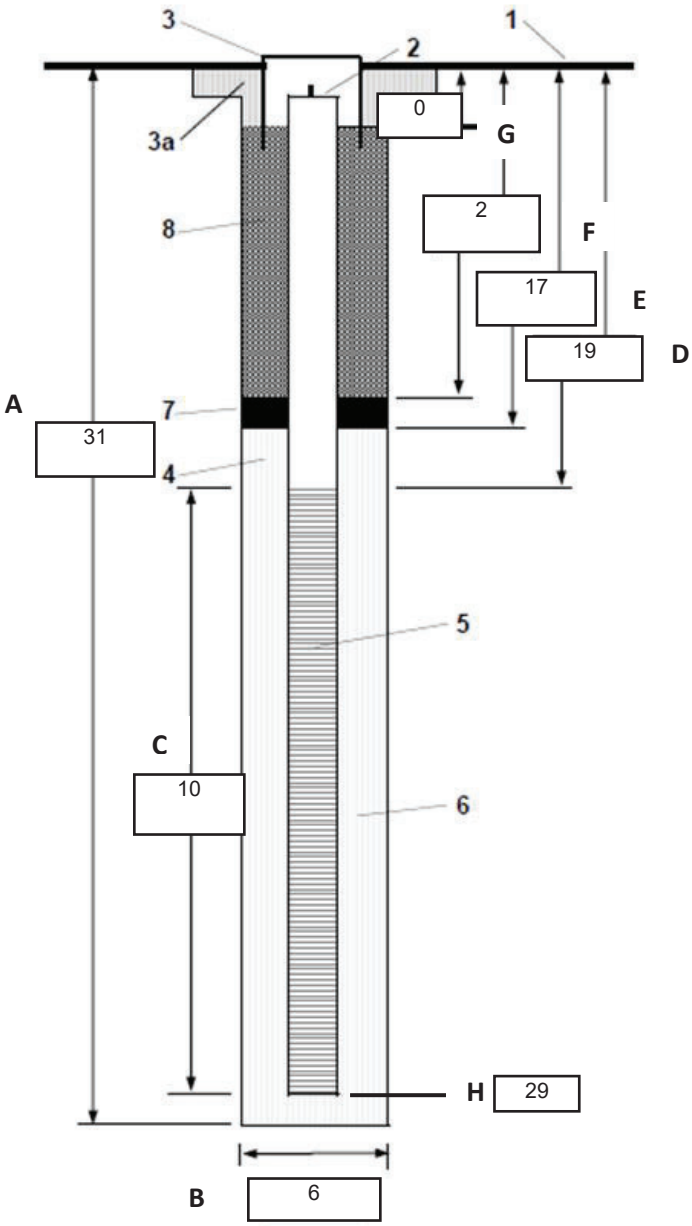
Comments:

A= Boring Depth (feet)
B= Borehole Diameter (inches)
C= Length of Screen (feet)
D= Depth to Top of Screen (feet)
E= Top of Sand Pack (feet)
F= Top of Annular Seal (feet)
G= Top of Grout Seal (feet)
H= Bottom of Screen (feet)

Jacobs	PROJECT NUMBER: 704758CH.05.06.FI	WELL NUMBER: NBKK-B76-MW09
	WELL COMPLETION DIAGRAM	

PROJECT: Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington
INSTALLATION: KEYPORT_NUWC
SITE: Building 76
LOGGER: Lyndsey Kleppin
DRILLING CONTRACTOR: Yellow Jacket
DRILLER NAME: Michael Anderson

DRILLING METHOD AND EQUIPMENT USED: Sonication (Sonic), Terrasonic Rig 150 CC
OUTER DIA: 6 (in) **INNER DIA:** 4 (in)
WATER LEVEL: 16 (ft bgs)
TOTAL WELL DEPTH: 29 (ft)
START: August 9, 2023 **END:** August 9, 2023



Single Well Below Ground Surface

1 – **Ground elevation at well:** 54.84

2 – **Top of casing elevation**: 54.59

3 – **Wellhead Cover:** 0 **(ft)**, Steel, Flush Mounted
- a) **Concrete Pad Length (ft**): 2
- b) **Concrete Pad Width (ft):** 2
- c) **Concrete Pad Depth (ft):** 1

4 – **Well Casing (in):** 2 / Schedule 40 PVC

5 – **Well Screen (in):** 0.02 / Factory slotted
Screen Interval (ft): 19 - 29

6/7 – **Type screen filter**: #12/20 silica sand
- a) **Quantity (lbs):** 250

8 – **Type of seal (in):** 3/4”
- a) **Quantity (lbs):** 300

9 – **Grout Mixture**: 0
Amount of Cement Used: 0
- a) **Amount of bentonite used:** 0
- b) **Amount of water used (gal):** 0
- c) **Method of placement:** 0
- d) **Vol. of well casing grout (gal):** 0

10 – **End Cap**: Schedule 40 PVC, 4 **(in)**, Flat

Comments:

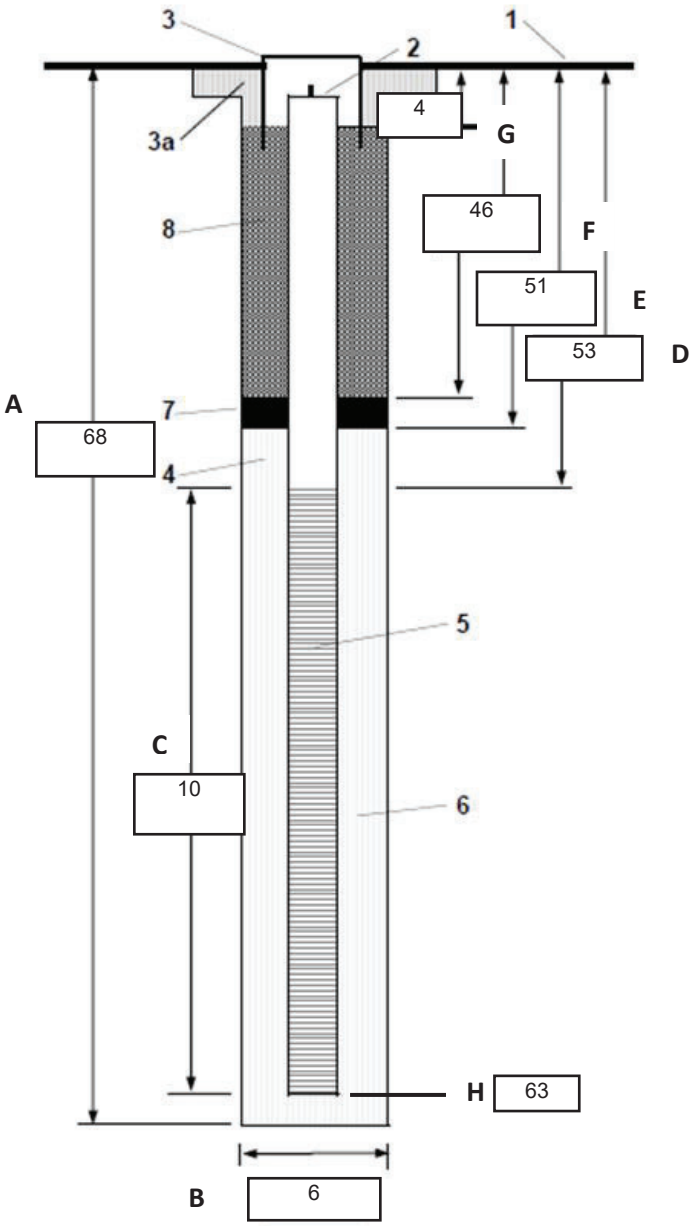
A= Boring Depth (feet)
B= Borehole Diameter (inches)
C= Length of Screen (feet)
D= Depth to Top of Screen (feet)
E= Top of Sand Pack (feet)
F= Top of Annular Seal (feet)
G= Top of Grout Seal (feet)
H= Bottom of Screen (feet)

Jacobs	PROJECT NUMBER: 704758CH.05.06.FI	WELL NUMBER: NBKK-CF1-MW01

WELL COMPLETION DIAGRAM

PROJECT: Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington
INSTALLATION: KEYPORT_NUWC
SITE: 2008 Car Fire
LOGGER: Ilka Dinkelman, Tommy Ta, Matt Steinkamp
DRILLING CONTRACTOR: Yellow Jacket
DRILLER NAME: Michael Anderson

DRILLING METHOD AND EQUIPMENT USED: Sonication (Sonic), Terrasonic Rig 150CC
OUTER DIA : 6 (in) **INNER DIA:** 4 (in)
WATER LEVEL: 33.6 (ft bgs)
TOTAL WELL DEPTH: 63 (ft)
START: October 13, 2022 **END:** October 13, 2022



1 – **Ground elevation at well (ft asml):** 34.91

2 – **Top of casing elevation (ft asml)**: 34.90

3 – **Wellhead Cover:** 0 **(ft)**, Steel, Flush Mounted
- a) **Concrete Pad Length (ft**): 2
- b) **Concrete Pad Width (ft):** 2
- c) **Concrete Pad Depth (ft):** 0.5

4 – **Well Casing (in):** 2" / Schedule 40 PVC

5 – **Well Screen (in):** 0.02" / Factory slotted
Screen Interval (ft): 53 - 63

6/7 – **Type screen filter**: #12/20 silica sand
- a) **Quantity (lbs):** 350

8 – **Type of seal (in):** 3/8" Chips
- a) **Quantity (lbs):** 100

9 – **Grout Mixture**: 2 bags Quick Grout
Amount of Cement Used:
- a) **Amount of bentonite used:**
- b) **Amount of water used (gal):** 40
- c) **Method of placement:** Tremi
- d) **Vol. of well casing grout (gal):** 40

10 – **End Cap**: Schedule 40 PVC, 2" Dia x 4" Long

Comments:

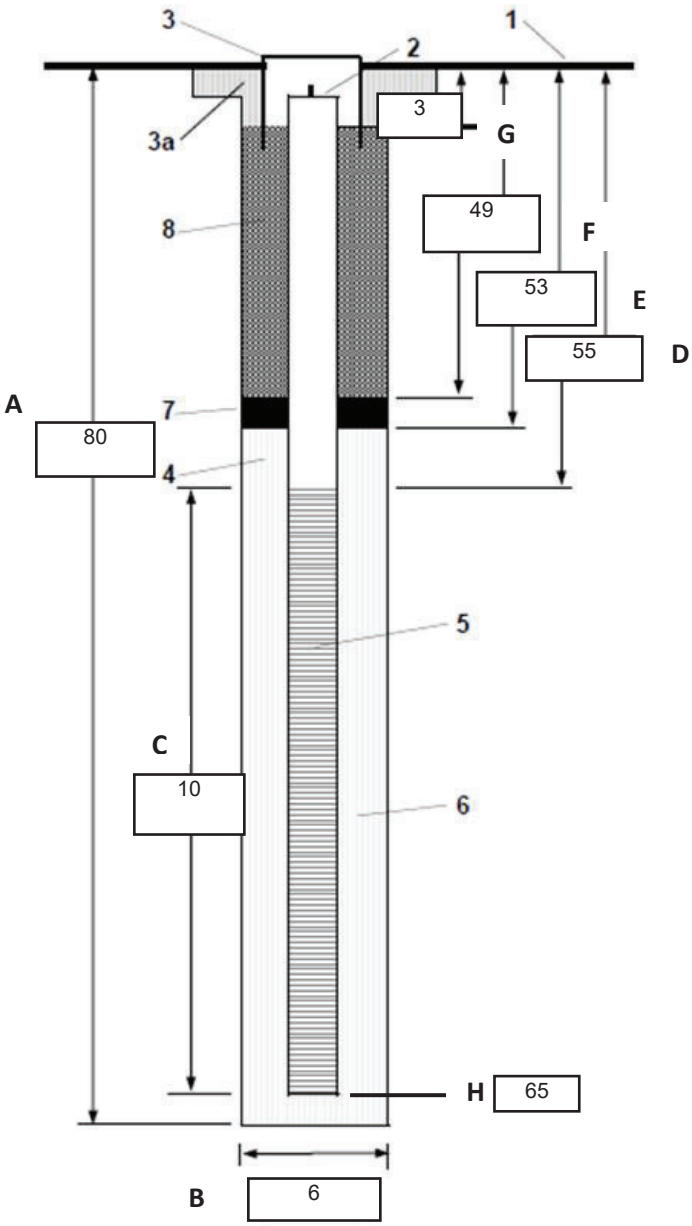
A= Boring Depth (feet)
B= Borehole Diameter (inches)
C= Length of Screen (feet)
D= Depth to Top of Screen (feet)
E= Top of Sand Pack (feet)
F= Top of Annular Seal (feet)
G= Top of Grout Seal (feet)
H= Bottom of Screen (feet)

Jacobs	PROJECT NUMBER: 704758CH.05.06.FI	WELL NUMBER: NBKK-CF1-MW02

WELL COMPLETION DIAGRAM

PROJECT: Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington
INSTALLATION: KEYPORT_NUWC
SITE: 2008 Car Fire
LOGGER: Ilka Dinkelman, Jordan Peery Lemon
DRILLING CONTRACTOR: Yellow Jacket
DRILLER NAME: Michael Anderson

DRILLING METHOD AND EQUIPMENT USED: Sonication (Sonic), Terrasonic Rig 150CC
OUTER DIA : 6 (in) **INNER DIA:** 4 (in)
WATER LEVEL: 39.1 (ft bgs)
TOTAL WELL DEPTH: 65 (ft)
START: November 5, 2022 **END:** November 5, 2022



1 – **Ground elevation at well (ft asml):** 43.12

2 – **Top of casing elevation (ft asml)**: 43.80

3 – **Wellhead Cover:** 0 **(ft)**, Steel, Flush Mounted
- a) **Concrete Pad Length (ft**): 2
- b) **Concrete Pad Width (ft):** 2
- c) **Concrete Pad Depth (ft):** 0.5

4 – **Well Casing (in):** 2" / Schedule 40 PVC

5 – **Well Screen (in):** 0.02" / Factory slotted
Screen Interval (ft): 55 - 65

6/7 – **Type screen filter**: #8/12 silicia sand
- a) **Quantity (lbs):** 350

8 – **Type of seal (in):** 3/8" Bentonite Chips
- a) **Quantity (lbs):** 100

9 – **Grout Mixture**: NA
Amount of Cement Used:
- a) **Amount of bentonite used:**
- b) **Amount of water used (gal):**
- c) **Method of placement:**
- d) **Vol. of well casing grout (gal):**

10 – **End Cap**: Schedule 40 PVC, 2" Dia x 4" Long

Comments:

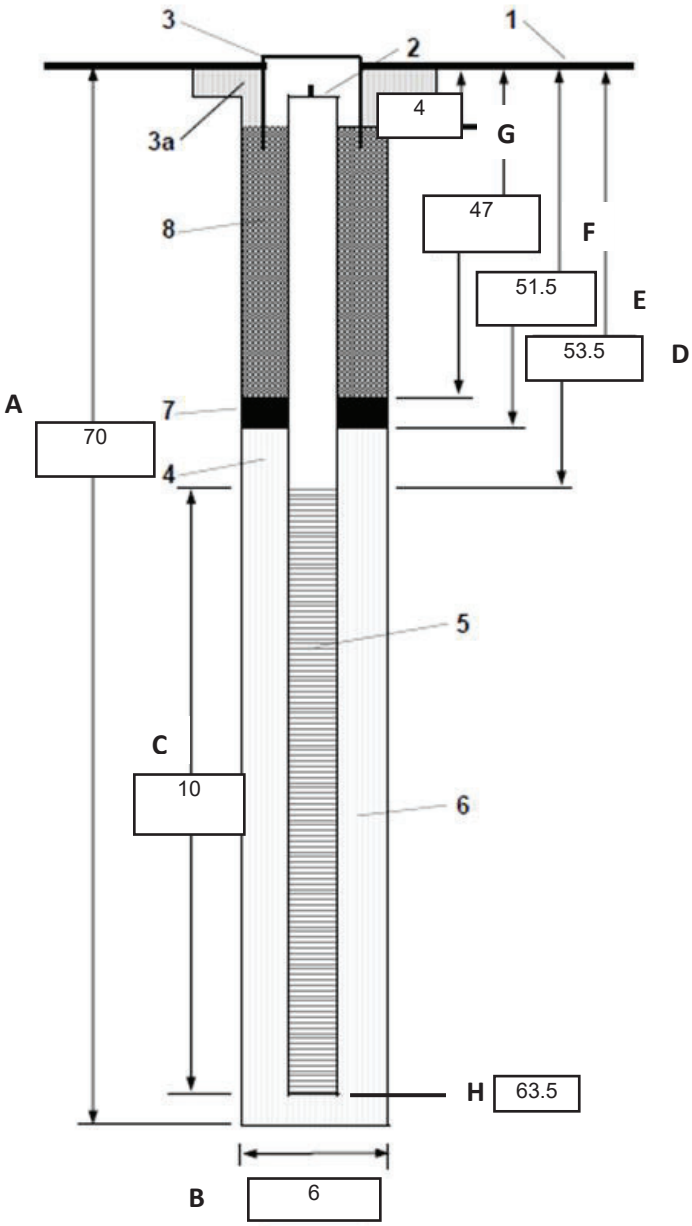
A= Boring Depth (feet)
B= Borehole Diameter (inches)
C= Length of Screen (feet)
D= Depth to Top of Screen (feet)
E= Top of Sand Pack (feet)
F= Top of Annular Seal (feet)
G= Top of Grout Seal (feet)
H= Bottom of Screen (feet)

Jacobs	PROJECT NUMBER: 704758CH.05.06.FI	WELL NUMBER: NBKK-CF1-MW03

WELL COMPLETION DIAGRAM

PROJECT: Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington
INSTALLATION: KEYPORT_NUWC
SITE: 2008 Car Fire
LOGGER: Ilka Dinkelman, Griffin Riley
DRILLING CONTRACTOR: Yellow Jacket
DRILLER NAME: Michael Anderson

DRILLING METHOD AND EQUIPMENT USED: Sonication (Sonic), Terrasonic 15CC
OUTER DIA : 6 (in) **INNER DIA:** 4 (in)
WATER LEVEL: 22.72 (ft bgs)
TOTAL WELL DEPTH: 63.5 (ft bgs)
START: October 24, 2022 **END:** October 24, 2022



1 – **Ground elevation at well:** 36

2 – **Top of casing elevation**: 36

3 – **Wellhead Cover:** 0 **(ft)**, Steel, Flush Mounted
a) **Concrete Pad Length (ft**): 2
b) **Concrete Pad Width (ft):** 2
c) **Concrete Pad Depth (ft):** 0.5

4 – **Well Casing (in):** 2" / Schedule 40 PVC

5 – **Well Screen (in):** 0.02" / Factory slotted
Screen Interval (ft): 53.5 - 63.5

6/7 – **Type screen filter**: #12/20 silica sand
a) **Quantity:**

8 – **Type of seal (in):** 3/8" chips
a) **Quantity:**

9 – **Grout Mixture**: NA
Amount of Cement Used:
a) **Amount of bentonite used:**
b) **Amount of water used (gal):**
c) **Method of placement:**
d) **Vol. of well casing grout (gal):**

10 – **End Cap**: Schedule 40 PVC, 2" Dia x 4" Long

Comments:

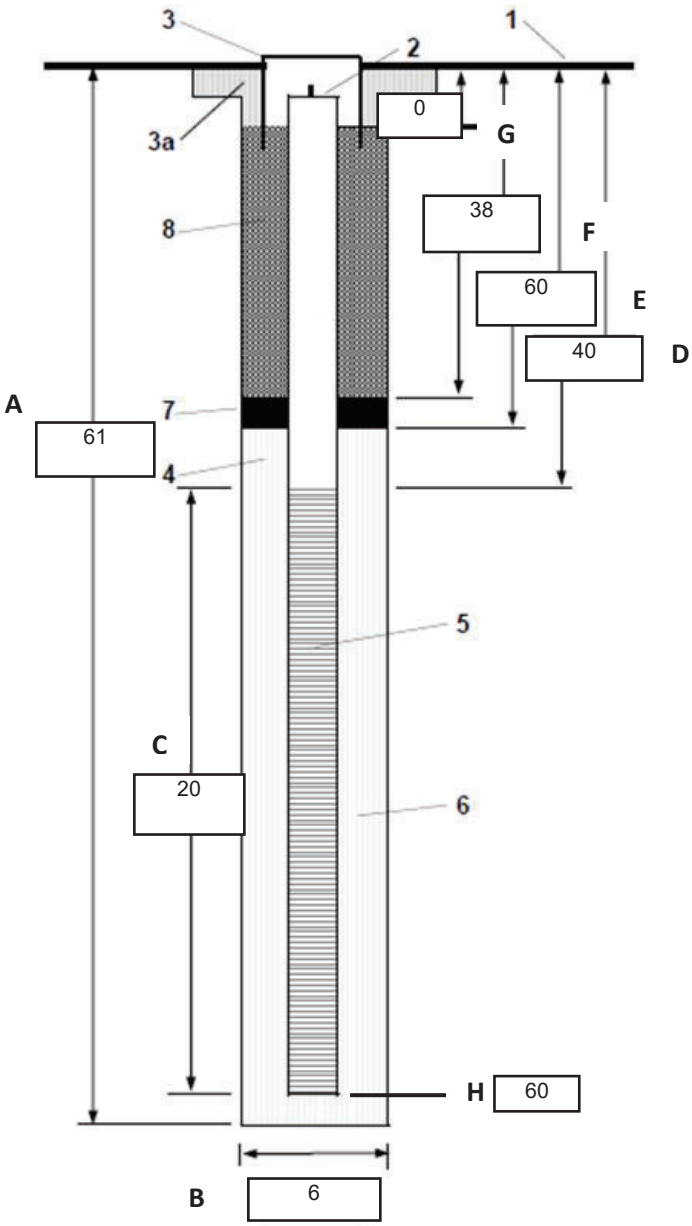
A= Boring Depth (feet)
B= Borehole Diameter (inches)
C= Length of Screen (feet)
D= Depth to Top of Screen (feet)
E= Top of Sand Pack (feet)
F= Top of Annular Seal (feet)
G= Top of Grout Seal (feet)
H= Bottom of Screen (feet)

Jacobs	PROJECT NUMBER: 704758CH.05.06.FI	WELL NUMBER: NBKK-OU2A5-MW01

WELL COMPLETION DIAGRAM

PROJECT: Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington
INSTALLATION: KEYPORT_NUWC
SITE: OU 2/Area 5
LOGGER: Ilka Dinkelman
DRILLING CONTRACTOR: Yellow Jacket
DRILLER NAME: Michael Anderson

DRILLING METHOD AND EQUIPMENT USED: Sonication (Sonic), Terrasonic Rig 150CC
OUTER DIA : 6 (in) **INNER DIA:** 4 (in)
WATER LEVEL: 42.2 (ft bgs)
TOTAL WELL DEPTH: 60 (ft)
START: October 31, 2022 **END:** October 31, 2022



Single Well Below Ground Surface

1 – **Ground elevation at well:** 21.70 ft

2 – **Top of casing elevation**: 21.44 ft

3 – **Wellhead Cover:** 0 **(ft)**, Steel, Flush Mounted
- a) **Concrete Pad Length (ft)**: 2
- b) **Concrete Pad Width (ft):** 2
- c) **Concrete Pad Depth (ft):** 1

4 – **Well Casing (in):** 2 / Schedule 40 PVC

5 – **Well Screen (in):** 0.02 / Factory slotted
Screen Interval (ft): 40 - 60

6/7 – **Type screen filter**: #12/20
- a) **Quantity:** 10

8 – **Type of seal (in):** 3/8”
- a) **Quantity:** 5

9 – **Grout Mixture**: 0
Amount of Cement Used:
- a) **Amount of bentonite used:**
- b) **Amount of water used (gal):**
- c) **Method of placement:**
- d) **Vol. of well casing grout (gal):**

10 – **End Cap**: Schedule 40 PVC, 4 **(in)**, Flat

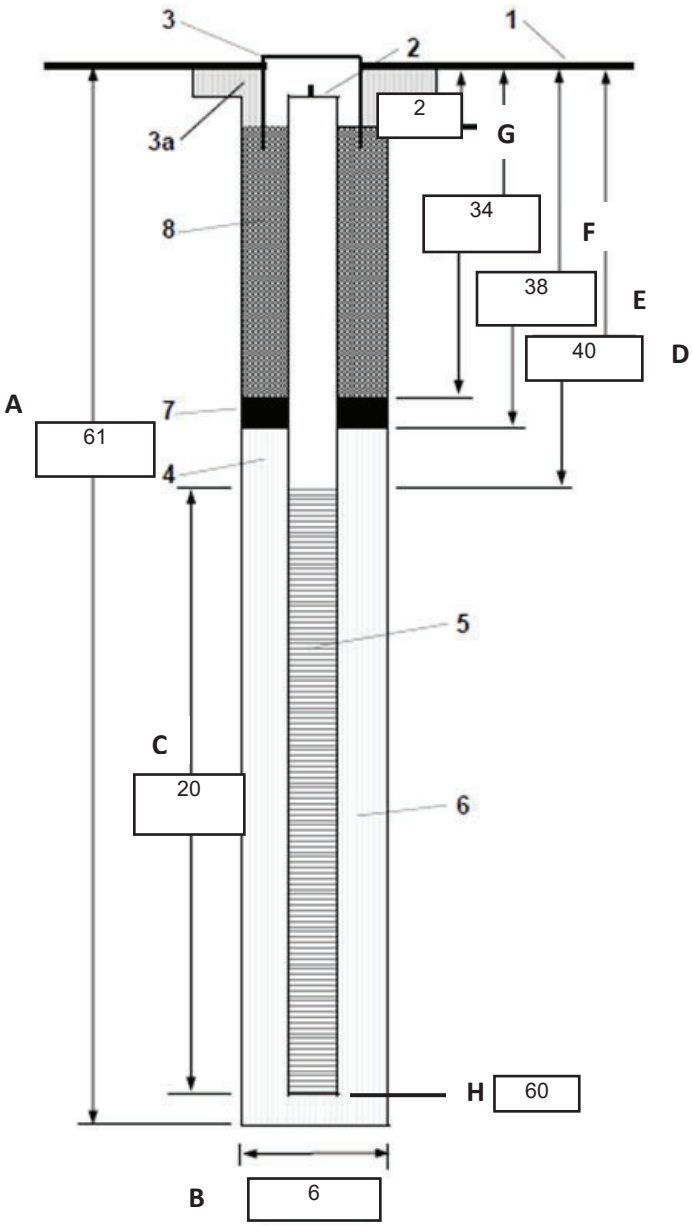
Comments: Another centralized at 19.0 - 2 used during well completiom

A= Boring Depth (feet)
B= Borehole Diameter (inches)
C= Length of Screen (feet)
D= Depth to Top of Screen (feet)
E= Top of Sand Pack (feet)
F= Top of Annular Seal (feet)
G= Top of Grout Seal (feet)
H= Bottom of Screen (feet)

Jacobs	PROJECT NUMBER: 704758CH.05.06.FI	WELL NUMBER: NBKK-OU2A5-MW02
	WELL COMPLETION DIAGRAM	

PROJECT: Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington
INSTALLATION: KEYPORT_NUWC
SITE: OU 2/Area 5
LOGGER: Ilka Dinkelman
DRILLING CONTRACTOR: Yellow Jacket
DRILLER NAME: Michael Anderson

DRILLING METHOD AND EQUIPMENT USED: Sonication (Sonic), Terrasonic Rig 150CC
OUTER DIA : 6 (in) **INNER DIA:** 4 (in)
WATER LEVEL: 5.5 (ft bgs)
TOTAL WELL DEPTH: 60 (ft)
START: October 29, 2022 **END:** October 29, 2022



Single Well Below Ground Surface

1 – **Ground elevation at well:** 18.50 ft

2 – **Top of casing elevation**: 18.06 ft

3 – **Wellhead Cover:** 0 **(ft)**, Steel, Flush Mounted
- a) **Concrete Pad Length (ft)**: 2
- b) **Concrete Pad Width (ft):** 2
- c) **Concrete Pad Depth (ft):** 1

4 – **Well Casing (in):** 1 / Schedule 40 PVC

5 – **Well Screen (in):** 0.02 / Factory slotted
Screen Interval (ft): 40 - 60

6/7 – **Type screen filter**: #8/12
- a) **Quantity:** 10

8 – **Type of seal (in):** 3/8" chips
- a) **Quantity:** 9

9 – **Grout Mixture**: 1
Amount of Cement Used: 4
- a) **Amount of bentonite used:**
- b) **Amount of water used (gal):**
- c) **Method of placement:** Tremmie
- d) **Vol. of well casing grout (gal):**

10 – **End Cap**: Schedule 40 PVC, 4 **(in)**, Flat

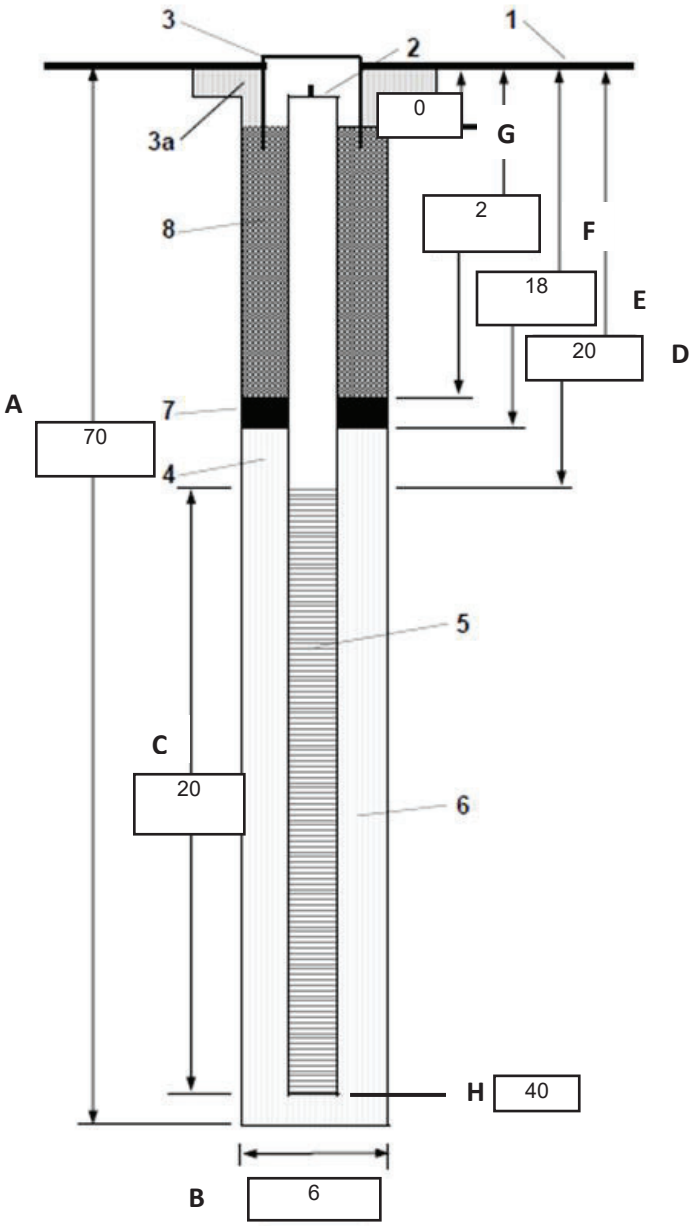
Comments: Second centralized used at 20'

A= Boring Depth (feet)
B= Borehole Diameter (inches)
C= Length of Screen (feet)
D= Depth to Top of Screen (feet)
E= Top of Sand Pack (feet)
F= Top of Annular Seal (feet)
G= Top of Grout Seal (feet)
H= Bottom of Screen (feet)

Jacobs	PROJECT NUMBER: 704758CH.05.06.FI	WELL NUMBER: NBKK-OU2A5-MW03
	WELL COMPLETION DIAGRAM	

PROJECT: Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington
INSTALLATION: KEYPORT_NUWC
SITE: OU 2/Area 5
LOGGER: Ilka Dinkelman, Caitlin Dronfield, Jordan Peery Lemon
DRILLING CONTRACTOR: Holt Drilling
DRILLER NAME: Quaid Curtis

DRILLING METHOD AND EQUIPMENT USED: Sonication (Sonic), Terrasonic 150CC
OUTER DIA : 6 (in) **INNER DIA:** 4 (in)
WATER LEVEL: 49.8 (ft bgs)
TOTAL WELL DEPTH: 40 (ft bgs)
START: September 8, 2022 **END:** September 8, 2022



1 – **Ground elevation at well (ft asml):** 26

2 – **Top of casing elevation (ft asml)**: 25

3 – **Wellhead Cover:** 0 **(ft)**, Steel, Flush Mounted
- a) **Concrete Pad Length (ft**): 2
- b) **Concrete Pad Width (ft):** 2
- c) **Concrete Pad Depth (ft):** 0.5

4 – **Well Casing (in):** 2" / Schedule 40 PVC

5 – **Well Screen (in):** 0.02" / Factory slotted
Screen Interval (ft): 20 - 40

6/7 – **Type screen filter**: #12/20 slica sand
- a) **Quantity (lbs):** 500

8 – **Type of seal (in):** 3/8" Bentonite Chips
- a) **Quantity (lbs):** 350

9 – **Grout Mixture**: NA
Amount of Cement Used:
- a) **Amount of bentonite used:**
- b) **Amount of water used (gal):**
- c) **Method of placement:**
- d) **Vol. of well casing grout (gal):**

10 – **End Cap**: Schedule 40 PVC, 2" Dia x 4" Long

Comments:

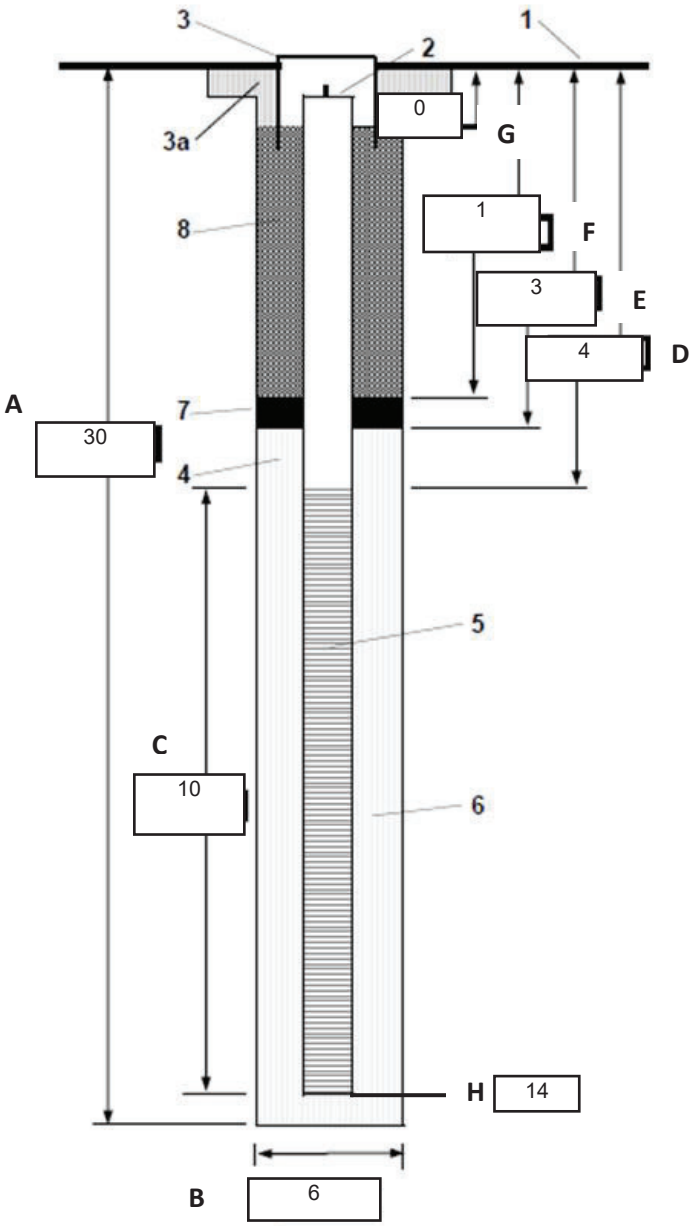
A= Boring Depth (feet)
B= Borehole Diameter (inches)
C= Length of Screen (feet)
D= Depth to Top of Screen (feet)
E= Top of Sand Pack (feet)
F= Top of Annular Seal (feet)
G= Top of Grout Seal (feet)
H= Bottom of Screen (feet)

Jacobs	PROJECT NUMBER: 704758CH.05.06.FI	WELL NUMBER: NBKK-B1006-MW01

WELL COMPLETION DIAGRAM

PROJECT: Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington
INSTALLATION: KEYPORT_NUWC
SITE: Building 1006
LOGGER: Ilka Dinkelman, Tommy Ta
DRILLING CONTRACTOR: Yellow Jacket
DRILLER NAME: Michael Anderson

DRILLING METHOD AND EQUIPMENT USED: Sonication (Sonic), Terrasonic 150CC
OUTER DIA : 6 (in) **INNER DIA:** 4 (in)
WATER LEVEL: 3.2 (ft bgs)
TOTAL WELL DEPTH: 14 (ft bgs)
START: October 10, 2022 **END:** October 10, 2022



1 – **Ground elevation at well (ft asml):** 13.82

2 – **Top of casing elevation (ft asml)**: 13.38

3 – **Wellhead Cover:** 0 **(ft)**, Steel, Flush Mounted
- a) **Concrete Pad Length (ft**): 2
- b) **Concrete Pad Width (ft):** 2
- c) **Concrete Pad Depth (ft):** 0.5

4 – **Well Casing (in):** 2" / Schedule 40 PVC

5 – **Well Screen (in):** 0.02" / Factory slotted
Screen Interval (ft): 4 - 14

6/7 – **Type screen filter**: #12/20 silica sand
- a) **Quantity (lbs):** 350

8 – **Type of seal (in):** 3/8" Bentonite Chips
- a) **Quantity (lbs):** 550

9 – **Grout Mixture**: NA
Amount of Cement Used:
- a) **Amount of bentonite used:**
- b) **Amount of water used (gal):**
- c) **Method of placement:**
- d) **Vol. of well casing grout (gal):**

10 – **End Cap**: Schedule 40 PVC, 2" Dia x 4" Long

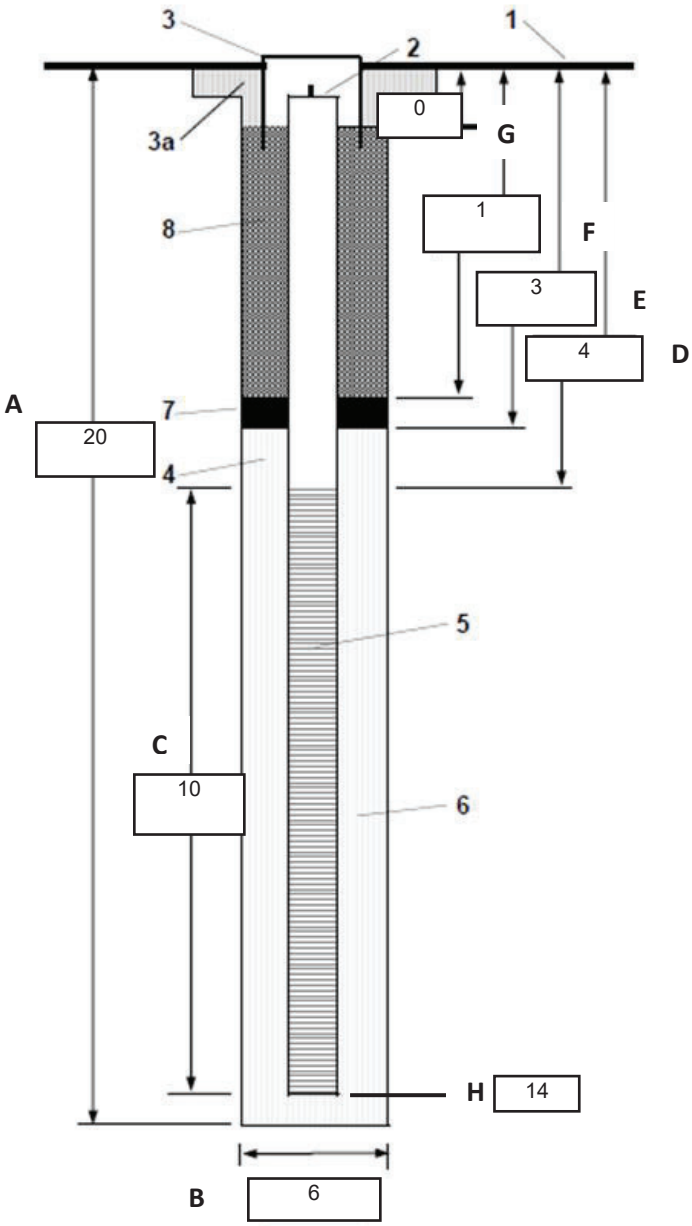
Comments:

A= Boring Depth (feet)
B= Borehole Diameter (inches)
C= Length of Screen (feet)
D= Depth to Top of Screen (feet)
E= Top of Sand Pack (feet)
F= Top of Annular Seal (feet)
G= Top of Grout Seal (feet)
H= Bottom of Screen (feet)

Jacobs	PROJECT NUMBER: 704758CH.05.06.FI	WELL NUMBER: NBKK-B1006-MW02
	WELL COMPLETION DIAGRAM	

PROJECT: Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington
INSTALLATION: KEYPORT_NUWC
SITE: Building 1006
LOGGER: Ilka Dinkelman, Tommy Ta
DRILLING CONTRACTOR: Yellow Jacket
DRILLER NAME: Michael Anderson

DRILLING METHOD AND EQUIPMENT USED: Sonication (Sonic), Terrasonic 150CC
OUTER DIA : 6 (in) **INNER DIA:** 4 (in)
WATER LEVEL: 2.75 (ft bgs)
TOTAL WELL DEPTH: 14 (ft bgs)
START: October 11, 2022 **END:** October 11, 2022



1 – **Ground elevation at well (ft asml):** 12.65

2 – **Top of casing elevation (ft asml)**: 12.34

3 – **Wellhead Cover:** 0 **(ft)**, Steel, Flush Mounted
- a) **Concrete Pad Length (ft**): 2
- b) **Concrete Pad Width (ft):** 2
- c) **Concrete Pad Depth (ft):** 0.5

4 – **Well Casing (in):** 2" / Schedule 40 PVC

5 – **Well Screen (in):** 0.02" / Factory slotted
Screen Interval (ft): 4 - 14

6/7 – **Type screen filter**: #12/20 silica sand
- **a) Quantity (lbs):** 450

8 – **Type of seal (in):** 3/8" Bentonite Chips
- a) **Quantity (lbs):** 100

9 – **Grout Mixture**: NA
Amount of Cement Used:
- a) **Amount of bentonite used:**
- b) **Amount of water used (gal):**
- c) **Method of placement:**
- d) **Vol. of well casing grout (gal):**

10 – **End Cap**: Schedule 40 PVC, 2" Dia x 4" Long

Comments:

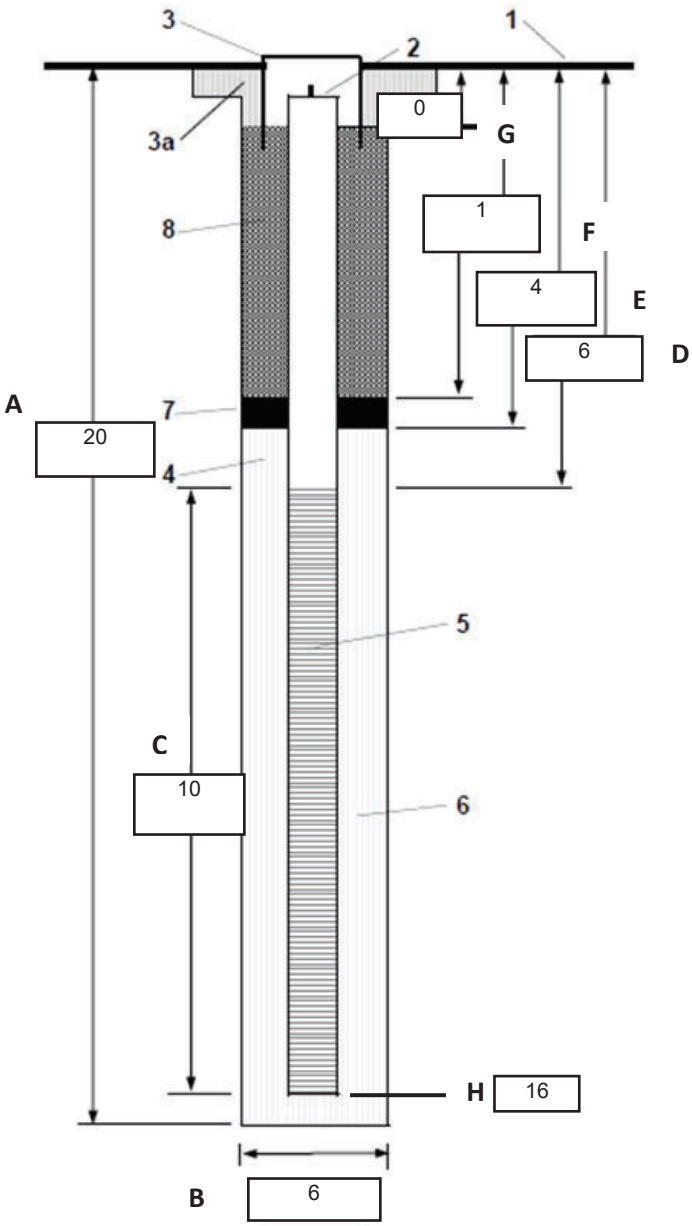
A= Boring Depth (feet)
B= Borehole Diameter (inches)
C= Length of Screen (feet)
D= Depth to Top of Screen (feet)
E= Top of Sand Pack (feet)
F= Top of Annular Seal (feet)
G= Top of Grout Seal (feet)
H= Bottom of Screen (feet)

Jacobs	PROJECT NUMBER: 704758CH.05.06.FI	WELL NUMBER: NBKK-B1006-MW03

WELL COMPLETION DIAGRAM

PROJECT: Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington
INSTALLATION: KEYPORT_NUWC
SITE: Building 1006
LOGGER: Ilka Dinkelman, Tommy Ta
DRILLING CONTRACTOR: Yellow Jacket,
DRILLER NAME: Michael Anderson

DRILLING METHOD AND EQUIPMENT USED: Sonication (Sonic), Terrasonic 150CC
OUTER DIA : 6 (in) **INNER DIA:** 4 (in)
WATER LEVEL: 6.9 (ft bgs)
TOTAL WELL DEPTH: 16 (ft bgs)
START: October 12, 2022 **END:** October 12, 2022



1 – **Ground elevation at well (ft asml):** 18.14

2 – **Top of casing elevation (ft asml)**: 17.87

3 – **Wellhead Cover:** 0 **(ft)**, Steel, Flush Mounted
- a) **Concrete Pad Length (ft**): 2
- b) **Concrete Pad Width (ft):** 2
- c) **Concrete Pad Depth (ft):** 0.5

4 – **Well Casing (in):** 4" / Schedule 40 PVC

5 – **Well Screen (in):** 0.02" / Factory slotted
Screen Interval (ft): 6 - 16

6/7 – **Type screen filter**: #12/20 silica sand
- a) **Quantity (lbs):** 350

8 – **Type of seal (in):** 3/8" Bentonite Chips
- a) **Quantity (lbs):** 100

9 – **Grout Mixture**: NA
Amount of Cement Used:
- a) **Amount of bentonite used:**
- b) **Amount of water used (gal):**
- c) **Method of placement:**
- **d) Vol. of well casing grout (gal):**

10 – **End Cap**: Schedule 40 PVC, 2" Dia x 4" Long

Comments:

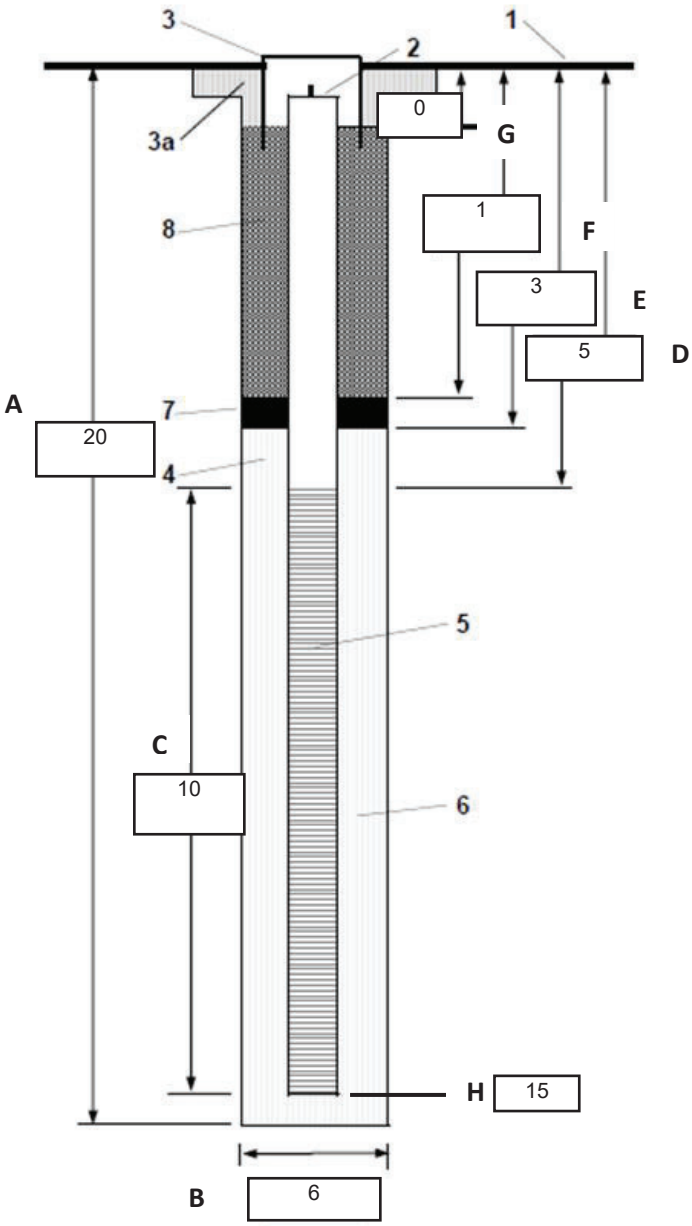
A= Boring Depth (feet)
B= Borehole Diameter (inches)
C= Length of Screen (feet)
D= Depth to Top of Screen (feet)
E= Top of Sand Pack (feet)
F= Top of Annular Seal (feet)
G= Top of Grout Seal (feet)
H= Bottom of Screen (feet)

Jacobs	PROJECT NUMBER: 704758CH.05.06.FI	WELL NUMBER: NBKK-B1006-MW04

WELL COMPLETION DIAGRAM

PROJECT: Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington
INSTALLATION: KEYPORT_NUWC
SITE: Building 1006
LOGGER: Ilka Dinkelman, Jordan Peery Lemon, Patrick Elliott
DRILLING CONTRACTOR: Yellow Jacket
DRILLER NAME: Michael Anderson

DRILLING METHOD AND EQUIPMENT USED: Sonication (Sonic), Terrasonic Rig 150CC
OUTER DIA : 6 (in) **INNER DIA:** 4 (in)
WATER LEVEL: 4.9 (ft bgs)
TOTAL WELL DEPTH: 15 (ft bgs)
START: November 5, 2022 **END:** November 5, 2022



1 – **Ground elevation at well (ft asml):** 15.75

2 – **Top of casing elevation (ft asml)**: 15.22

3 – **Wellhead Cover:** 0 **(ft)**, Steel, Flush Mounted
- a) **Concrete Pad Length (ft**): 2
- b) **Concrete Pad Width (ft):** 2
- c) **Concrete Pad Depth (ft):** 0.5

4 – **Well Casing (in):** 2" / Schedule 40 PVC

5 – **Well Screen (in):** 0.02" / Factory slotted
Screen Interval (ft): 5 - 15

6/7 – **Type screen filter**: #12/20 silica sand
- a) **Quantity (lbs):** 350

8 – **Type of seal (in):** 3/8" Bentonite Chips
- **a) Quantity (lbs):** 100

9 – **Grout Mixture**: NA
Amount of Cement Used:
- a) **Amount of bentonite used:**
- b) **Amount of water used (gal):**
- c) **Method of placement:**
- d) **Vol. of well casing grout (gal):**

10 – **End Cap**: Schedule 40 PVC, 2" Dia x 4" Long

Comments:

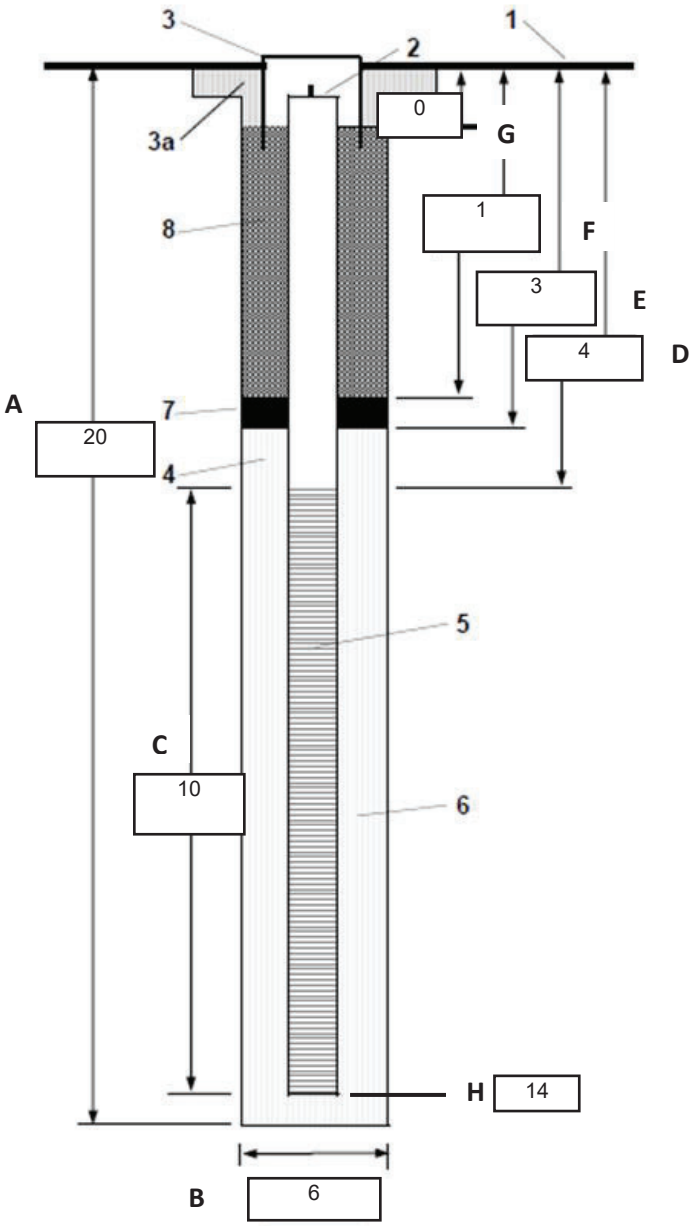
A= Boring Depth (feet)
B= Borehole Diameter (inches)
C= Length of Screen (feet)
D= Depth to Top of Screen (feet)
E= Top of Sand Pack (feet)
F= Top of Annular Seal (feet)
G= Top of Grout Seal (feet)
H= Bottom of Screen (feet)

Jacobs	PROJECT NUMBER: 704758CH.05.06.FI	WELL NUMBER: NBKK-OU2A2-MW01

WELL COMPLETION DIAGRAM

PROJECT: Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington
INSTALLATION: KEYPORT_NUWC
SITE: OU 2/Area 2
LOGGER: Ilka Dinkelman, Jordan Peery Lemon, Patrick Elliott
DRILLING CONTRACTOR: Yellow Jacket
DRILLER NAME: Michael Anderson

DRILLING METHOD AND EQUIPMENT USED: Sonication (Sonic), Terrasonic Rig 150CC
OUTER DIA : 6 (in) **INNER DIA:** 4 (in)
WATER LEVEL: 4.4 (ft bgs)
TOTAL WELL DEPTH: 14 (ft bgs)
START: November 6, 2022 **END:** November 6, 2022



1 – **Ground elevation at well (ft asml):** 28.39

2 – **Top of casing elevation (ft asml)**: 28.15

3 – **Wellhead Cover:** 0 **(ft)**, Steel, Flush Mounted
a) **Concrete Pad Length (ft**): 2
b) **Concrete Pad Width (ft):** 2
c) **Concrete Pad Depth (ft):** 0.5

4 – **Well Casing (in):** 2" / Schedule 40 PVC

5 – **Well Screen (in):** 0.02" / Factory slotted
Screen Interval (ft): 4 - 14

6/7 – **Type screen filter**: #8/12 silica sand
a) **Quantity (lbs):** 350

8 – **Type of seal (in):** 3/8" Bentonite Chips
a) Quantity (lbs): 100

9 – **Grout Mixture**: NA
Amount of Cement Used:
a) **Amount of bentonite used:**
b) **Amount of water used (gal):**
c) **Method of placement:**
d) **Vol. of well casing grout (gal):**

10 – **End Cap**: Schedule 40 PVC, 2" Dia x 4" Long

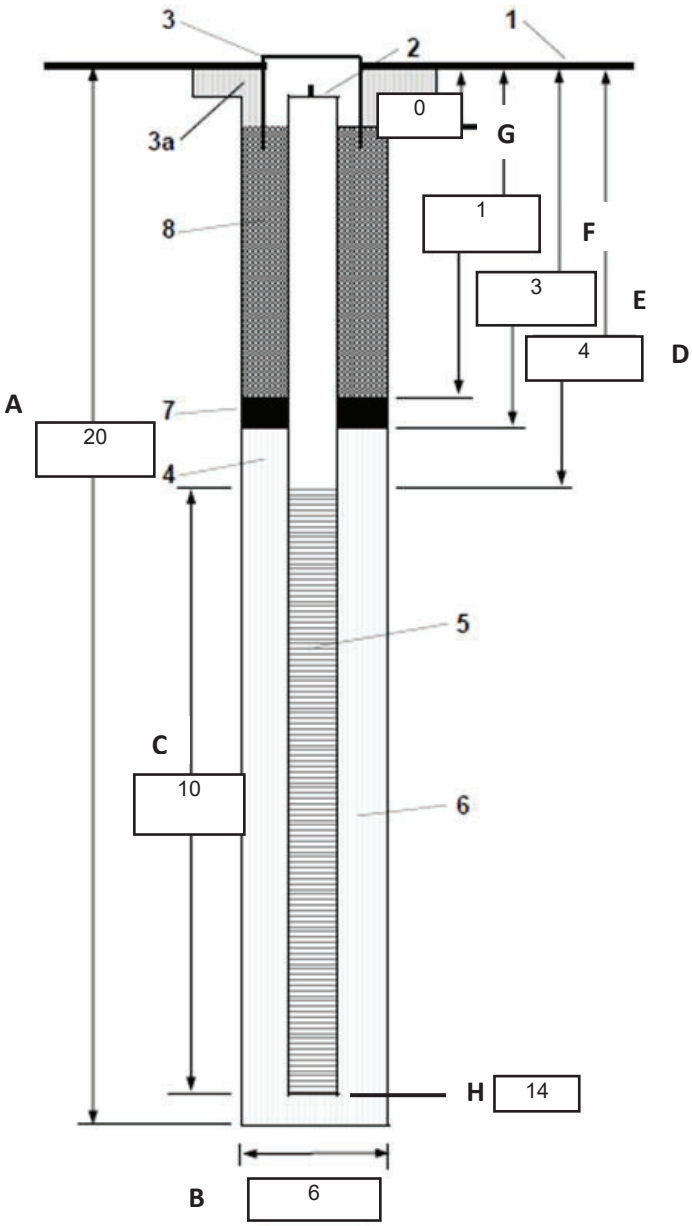
Comments:

A= Boring Depth (feet)
B= Borehole Diameter (inches)
C= Length of Screen (feet)
D= Depth to Top of Screen (feet)
E= Top of Sand Pack (feet)
F= Top of Annular Seal (feet)
G= Top of Grout Seal (feet)
H= Bottom of Screen (feet)

Jacobs	PROJECT NUMBER: 704758CH.05.06.FI	WELL NUMBER: NBKK-OU2A2-MW02
	WELL COMPLETION DIAGRAM	

PROJECT: Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington
INSTALLATION: KEYPORT_NUWC
SITE: OU 2/Area 2
LOGGER: Ilka Dinkelman
DRILLING CONTRACTOR: Yellow Jacket
DRILLER NAME:

DRILLING METHOD AND EQUIPMENT USED: Sonication (Sonic), Terrasonic Rig 150CC
OUTER DIA : 6 (in) **INNER DIA:** 4 (in)
WATER LEVEL: 4.9 (ft bgs)
TOTAL WELL DEPTH: 14 (ft)
START: November 4, 2022 **END:** November 4, 2022



Single Well Above Ground Surface

1 – **Ground elevation at well:** 25.42 ft

2 – **Top of casing elevation**: 27.26 ft

3 – **Wellhead Cover:** 3 **(ft)**, Steel, Riser - casing that is above the ground surface
- a) **Concrete Pad Length (ft**): 2
- b) **Concrete Pad Width (ft):** 2
- c) **Concrete Pad Depth (ft):** 1.25

4 – **Well Casing (in):** 2 / Schedule 40 PVC

5 – **Well Screen (in):** 0.02 / Factory slotted
Screen Interval (ft): 4 - 14

6/7 – **Type screen filter**: #8/12
- a) **Quantity:** 8

8 – **Type of seal (in):** 3/8
- a) **Quantity:** 1

9 – **Grout Mixture**: 0
Amount of Cement Used: 4
- a) **Amount of bentonite used:** 0
- b) **Amount of water used (gal):**
- c) **Method of placement:**
- d) **Vol. of well casing grout (gal):**

10 – **End Cap**: Schedule 40 PVC, 4 **(in)**, Flat

Comments:

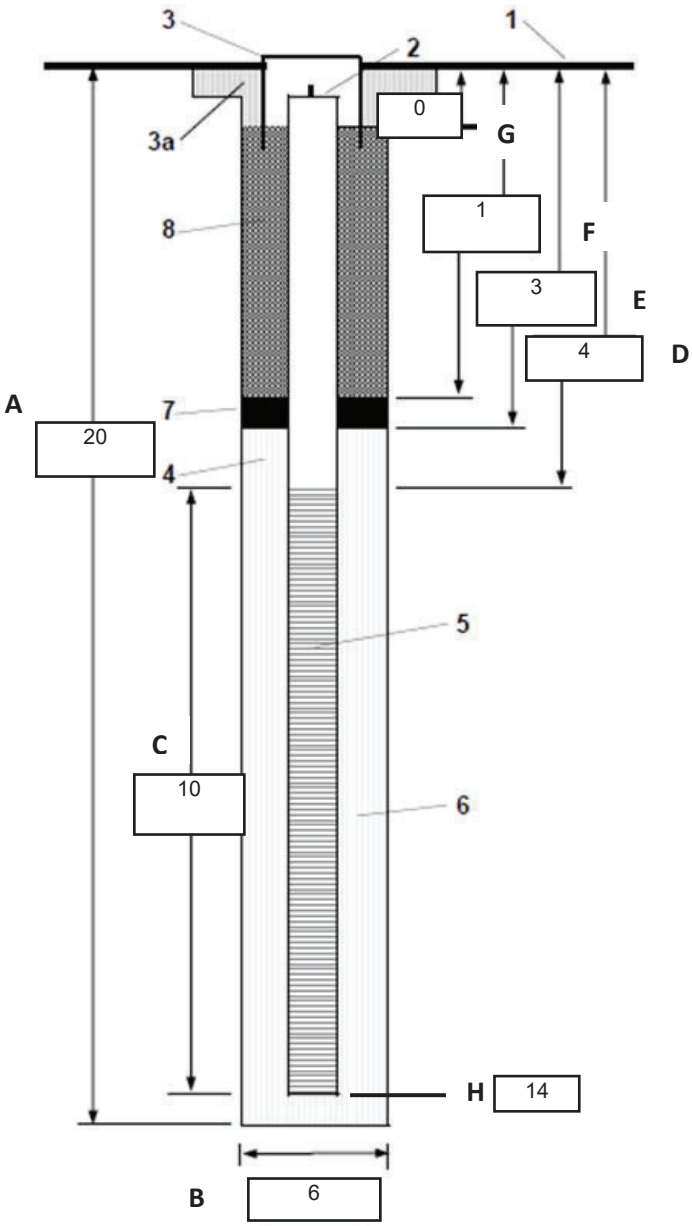
A= Boring Depth (feet)
B= Borehole Diameter (inches)
C= Length of Screen (feet)
D= Depth to Top of Screen (feet)
E= Top of Sand Pack (feet)
F= Top of Annular Seal (feet)
G= Top of Grout Seal (feet)
H= Bottom of Screen (feet)

Jacobs	PROJECT NUMBER: 704758CH.05.06.FI	WELL NUMBER: NBKK-OU2A2-MW03

WELL COMPLETION DIAGRAM

PROJECT: Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington
INSTALLATION: KEYPORT_NUWC
SITE: OU 2/Area 2
LOGGER: Ilka Dinkelman, Jordan Peery Lemon
DRILLING CONTRACTOR: Yellow Jacket
DRILLER NAME: Michael Anderson

DRILLING METHOD AND EQUIPMENT USED: Sonication (Sonic), Terrasonic Rig 150CC
OUTER DIA : 6 (in) **INNER DIA:** 4 (in)
WATER LEVEL: 4.7 (ft bgs)
TOTAL WELL DEPTH: 14 (ft bgs)
START: November 5, 2022 **END:** November 5, 2022



1 – **Ground elevation at well (ft asml):** 23.60

2 – **Top of casing elevation (ft asml)**: 23.18

3 – **Wellhead Cover:** 0 **(ft)**, Steel, Flush Mounted
a) **Concrete Pad Length (ft**): 2
b) **Concrete Pad Width (ft):** 2
c) **Concrete Pad Depth (ft):** 0.5

4 – **Well Casing (in):** 2" / Schedule 40 PVC

5 – **Well Screen (in):** 0.02" / Factory slotted
Screen Interval (ft): 4 - 14

6/7 – **Type screen filter**: #12/20 silica sand
a) **Quantity (lbs):** 350

8 – **Type of seal (in):** 3/8" Bentonite Chips
a) Quantity (lbs): 100

9 – **Grout Mixture**: NA
Amount of Cement Used:
a) **Amount of bentonite used:**
b) **Amount of water used (gal):**
c) **Method of placement:**
d) **Vol. of well casing grout (gal):**

10 – **End Cap**: Schedule 40 PVC, 2" Dia x 4" Long

Comments:

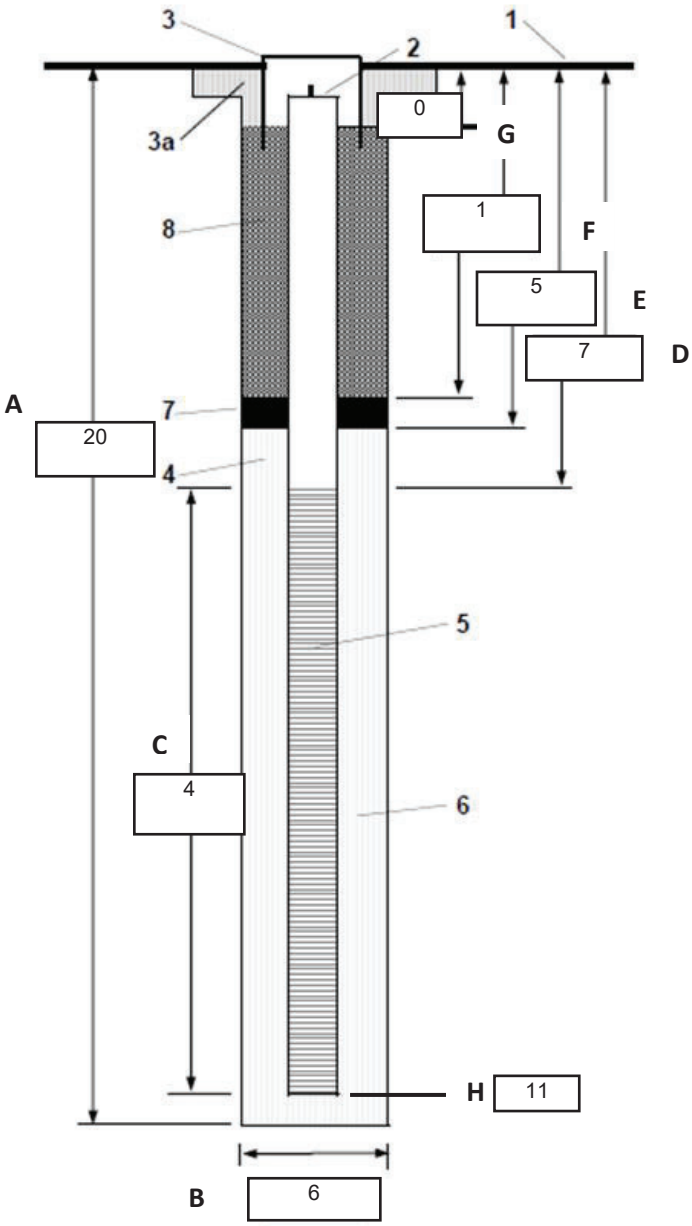
A= Boring Depth (feet)
B= Borehole Diameter (inches)
C= Length of Screen (feet)
D= Depth to Top of Screen (feet)
E= Top of Sand Pack (feet)
F= Top of Annular Seal (feet)
G= Top of Grout Seal (feet)
H= Bottom of Screen (feet)

Jacobs	PROJECT NUMBER: 704758CH.05.06.FI	WELL NUMBER: NBKK-OU2A2-MW04

WELL COMPLETION DIAGRAM

PROJECT: Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington
INSTALLATION: KEYPORT_NUWC
SITE: OU 2/Area 2
LOGGER: Ilka Dinkelman, Jordan Peery Lemon, Patrick Elliott
DRILLING CONTRACTOR: Yellow Jacket
DRILLER NAME: Michael Anderson

DRILLING METHOD AND EQUIPMENT USED: Sonication (Sonic), Terrasonic Rig 150CC
OUTER DIA : 6 (in) **INNER DIA:** 4 (in)
WATER LEVEL: 8.65 (ft bgs)
TOTAL WELL DEPTH: 11 (ft bgs)
START: November 9, 2022 **END:** November 9, 2022



1 – **Ground elevation at well (ft asml):** 23.98

2 – **Top of casing elevation (ft asml)**: 23.66

3 – **Wellhead Cover:** 0 **(ft)**, Steel, Flush Mounted
a) **Concrete Pad Length (ft**): 2
b) **Concrete Pad Width (ft):** 2
c) **Concrete Pad Depth (ft):** 0.5

4 – **Well Casing (in):** 2" / Schedule 40 PVC

5 – **Well Screen (in):** 0.02" / Factory slotted
Screen Interval (ft): 7 - 17

6/7 – **Type screen filter**: #8/12 silica sand
a) **Quantity (lbs):** 350

8 – **Type of seal (in):** 3/8" Bentonite Chips
a) Quantity (lbs): 100

9 – **Grout Mixture**: NA
Amount of Cement Used:
a) **Amount of bentonite used:**
b) **Amount of water used (gal):**
c) **Method of placement:**
d) **Vol. of well casing grout (gal):**

10 – **End Cap**: Schedule 40 PVC, 2 Dia x 4" Long

Comments:

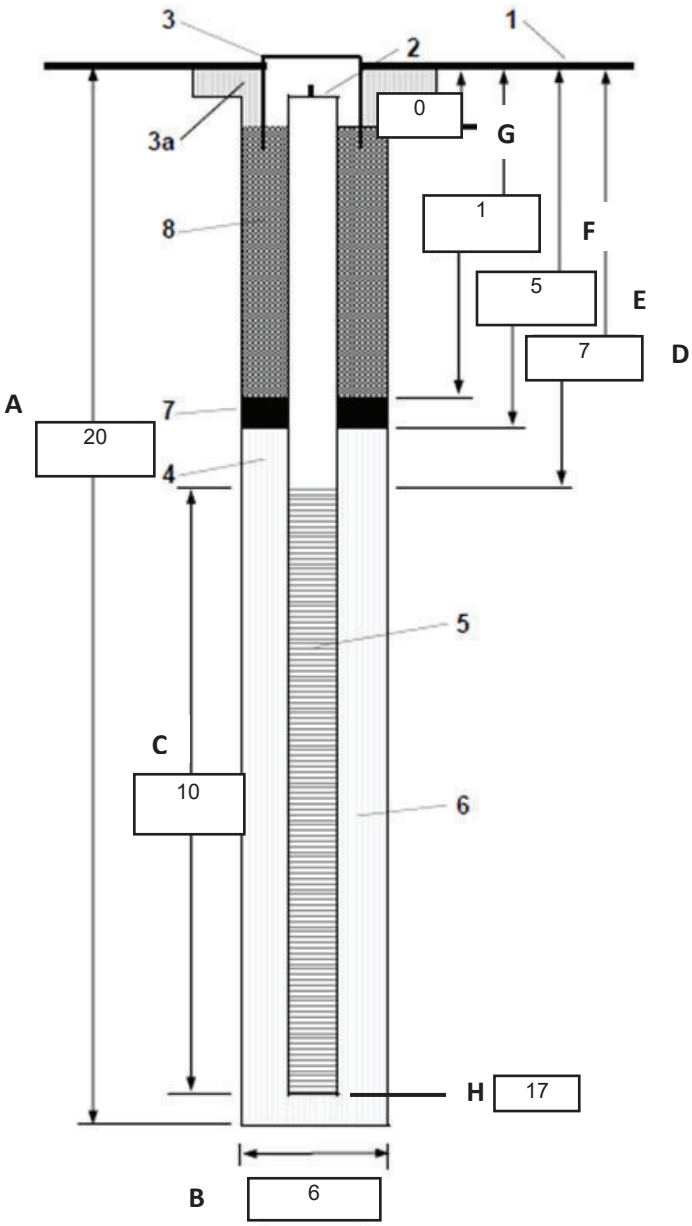
A= Boring Depth (feet)
B= Borehole Diameter (inches)
C= Length of Screen (feet)
D= Depth to Top of Screen (feet)
E= Top of Sand Pack (feet)
F= Top of Annular Seal (feet)
G= Top of Grout Seal (feet)
H= Bottom of Screen (feet)

Jacobs	PROJECT NUMBER: 704758CH.05.06.FI	WELL NUMBER: NBKK-OU2A2-MW05

WELL COMPLETION DIAGRAM

PROJECT: Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington
INSTALLATION: KEYPORT_NUWC
SITE: OU 2/Area 2
LOGGER: Ilka Dinkelman, Jordan Peery Lemon, Patrick Elliott
DRILLING CONTRACTOR: Yellow Jacket
DRILLER NAME: Michael Anderson

DRILLING METHOD AND EQUIPMENT USED: Sonication (Sonic), Terrasonic Rig
OUTER DIA : 6 (in) **INNER DIA:** 4 (in)
WATER LEVEL: 8.2 (ft bgs)
TOTAL WELL DEPTH: 17 (ft)
START: November 9, 2022 **END:** November 9, 2022



1 – **Ground elevation at well (ft asml):** 24.90

2 – **Top of casing elevation (ft asml)**: 24

3 – **Wellhead Cover:** 0 **(ft)**, Steel, Flush Mounted
a) **Concrete Pad Length (ft**): 2
b) **Concrete Pad Width (ft):** 2
c) **Concrete Pad Depth (ft):** 0.5

4 – **Well Casing (in):** 2" / Schedule 40 PVC

5 – **Well Screen (in):** 0.02" / Factory slotted
Screen Interval (ft): 7 - 17

6/7 – **Type screen filter**: #8/12
a) **Quantity (lbs):** 350

8 – **Type of seal (in):** 3/8" Bentonite Chips
a) Quantity (lbs): 100

9 – **Grout Mixture**: NA
Amount of Cement Used:
a) **Amount of bentonite used:**
b) **Amount of water used (gal):**
c) **Method of placement:**
d) **Vol. of well casing grout (gal):**

10 – **End Cap**: Schedule 40 PVC, 2" Dia x 4" Long

Comments:

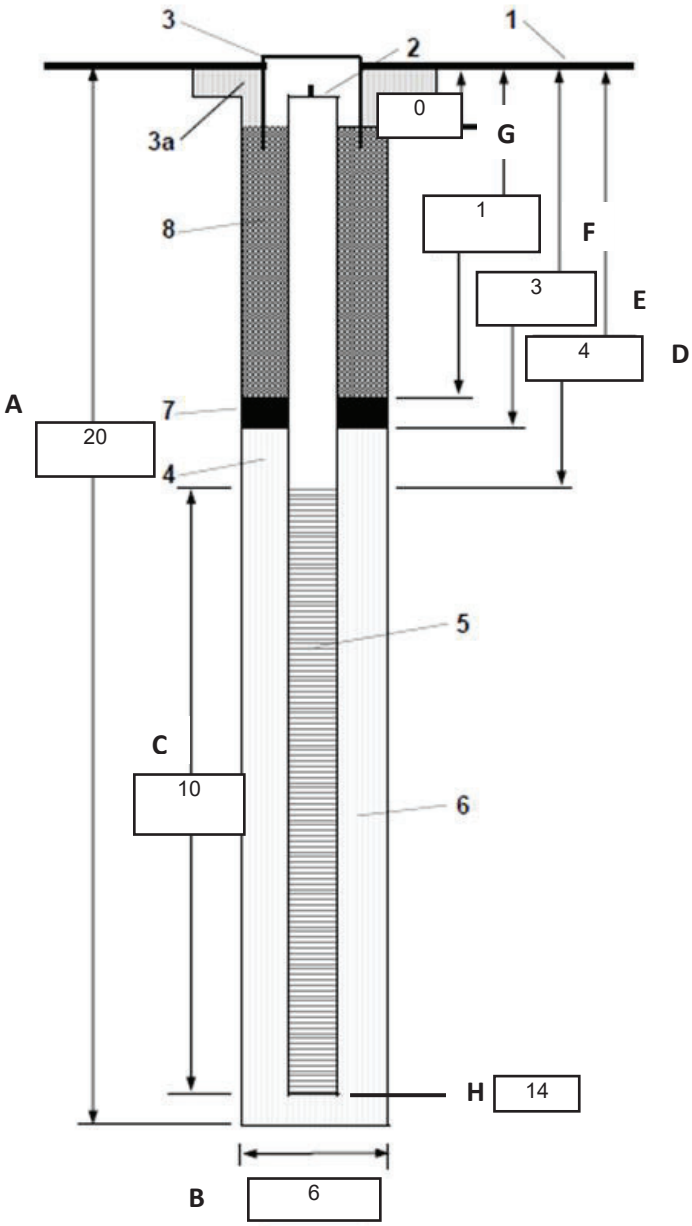
A= Boring Depth (feet)
B= Borehole Diameter (inches)
C= Length of Screen (feet)
D= Depth to Top of Screen (feet)
E= Top of Sand Pack (feet)
F= Top of Annular Seal (feet)
G= Top of Grout Seal (feet)
H= Bottom of Screen (feet)

Jacobs	PROJECT NUMBER: 704758CH.05.06.FI	WELL NUMBER: NBKK-OU2A2-MW06

WELL COMPLETION DIAGRAM

PROJECT: Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington
INSTALLATION: KEYPORT_NUWC
SITE: OU 2/Area 2
LOGGER: Ilka Dinkelman
DRILLING CONTRACTOR: Yellow Jacket
DRILLER NAME: Michael Anderson

DRILLING METHOD AND EQUIPMENT USED: Sonication (Sonic), Terrasonic Rig 150CC
OUTER DIA : 6 (in) **INNER DIA:** 4 (in)
WATER LEVEL: 4.8 (ft bgs)
TOTAL WELL DEPTH: 14 (ft)
START: November 9, 2022 **END:** November 9, 2022



Single Well Above Ground Surface

1 – **Ground elevation at well:** 20.93 ft

2 – **Top of casing elevation**: 23.21 ft

3 – **Wellhead Cover:** 3 **(ft)**, Steel, Riser - casing that is above the ground surface
a) **Concrete Pad Length (ft**): 2
b) **Concrete Pad Width (ft):** 2
c) **Concrete Pad Depth (ft):** 1.25

4 – **Well Casing (in):** 2 / Schedule 40 PVC

5 – **Well Screen (in):** 0.02 / Factory slotted
Screen Interval (ft): 4 - 14

6/7 – **Type screen filter**: #8/12
a) **Quantity:** 7

8 – **Type of seal (in):** 3/8”
a) **Quantity:** 1

9 – **Grout Mixture**: 0
Amount of Cement Used: 7
a) **Amount of bentonite used:**
b) **Amount of water used (gal):**
c) **Method of placement:**
d) **Vol. of well casing grout (gal):**

10 – **End Cap**: Schedule 40 PVC, 4 **(in)**, Flat

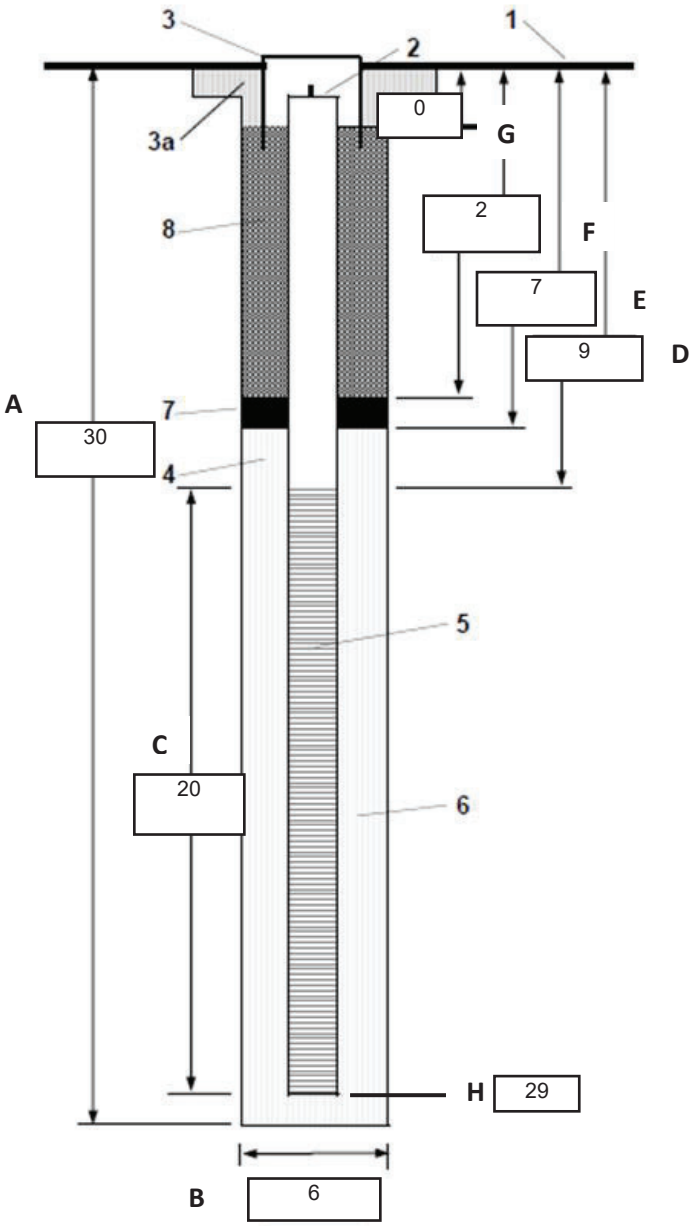
Comments:

A= Boring Depth (feet)
B= Borehole Diameter (inches)
C= Length of Screen (feet)
D= Depth to Top of Screen (feet)
E= Top of Sand Pack (feet)
F= Top of Annular Seal (feet)
G= Top of Grout Seal (feet)
H= Bottom of Screen (feet)

Jacobs	PROJECT NUMBER: 704758CH.05.06.FI	WELL NUMBER: NBKK-S7-MW01
	WELL COMPLETION DIAGRAM	

PROJECT: Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington
INSTALLATION: KEYPORT_NUWC
SITE: Site 7
LOGGER: Ilka Dinkelman
DRILLING CONTRACTOR: Yellow Jacket
DRILLER NAME: Michael Anderson

DRILLING METHOD AND EQUIPMENT USED: Sonication (Sonic), Terrasonic Rig 150CC
OUTER DIA : 6 (in) **INNER DIA:** 4 (in)
WATER LEVEL: 10.7 (ft bgs)
TOTAL WELL DEPTH: 29 (ft)
START: October 28, 2022 **END:** October 28, 2022



Single Well Below Ground Surface

1 – **Ground elevation at well:** 13.69 ft

2 – **Top of casing elevation**: 13.33 ft

3 – **Wellhead Cover:** 0 **(ft)**, Steel, Flush Mounted
- a) **Concrete Pad Length (ft**): 2
- b) **Concrete Pad Width (ft):** 2
- c) **Concrete Pad Depth (ft):** 1

4 – **Well Casing (in):** 2 / Schedule 40 PVC

5 – **Well Screen (in):** 0.02 / Factory slotted
Screen Interval (ft): 9 - 29

6/7 – **Type screen filter**: #12/20
- a) **Quantity:** 10

8 – **Type of seal (in):** 3/8”
- a) **Quantity:** 4

9 – **Grout Mixture**: 0
Amount of Cement Used:
- a) **Amount of bentonite used:**
- b) **Amount of water used (gal):**
- c) **Method of placement:**
- d) **Vol. of well casing grout (gal):**

10 – **End Cap**: Schedule 40 PVC, 4 **(in)**, Flat

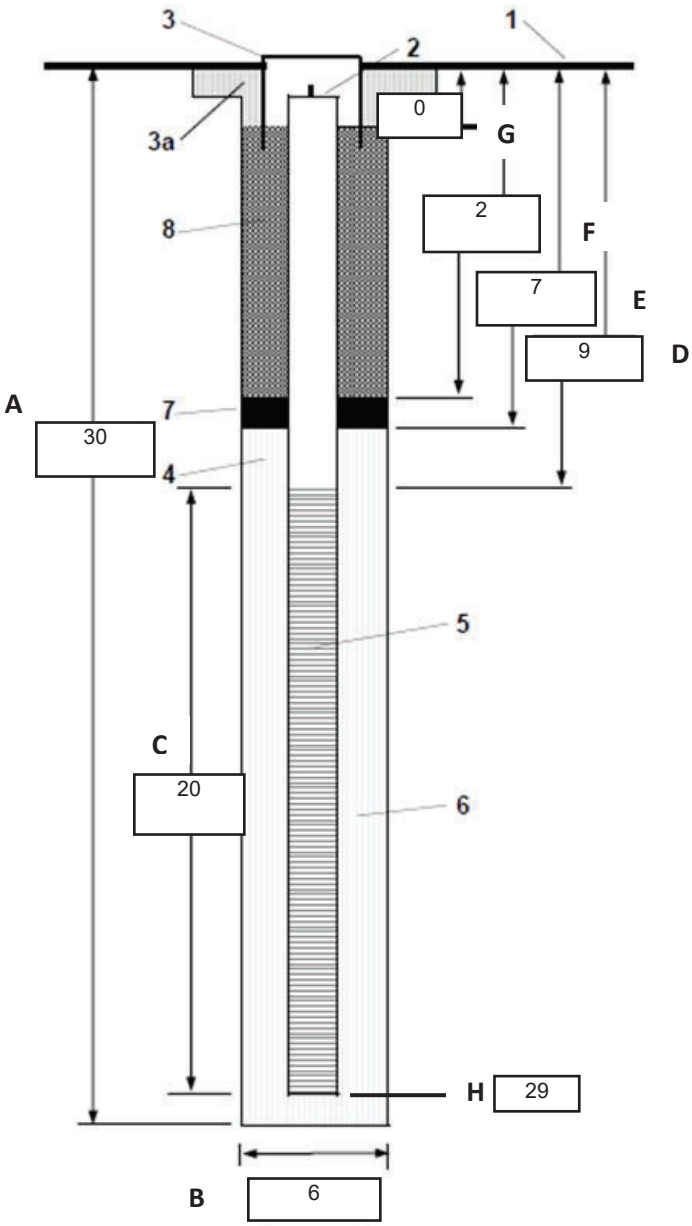
Comments:

A= Boring Depth (feet)
B= Borehole Diameter (inches)
C= Length of Screen (feet)
D= Depth to Top of Screen (feet)
E= Top of Sand Pack (feet)
F= Top of Annular Seal (feet)
G= Top of Grout Seal (feet)
H= Bottom of Screen (feet)

Jacobs	PROJECT NUMBER: 704758CH.05.06.FI	WELL NUMBER: NBKK-S7-MW02
	WELL COMPLETION DIAGRAM	

PROJECT: Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington
INSTALLATION: KEYPORT_NUWC
SITE: Site 7
LOGGER: Ilka Dinkelman
DRILLING CONTRACTOR: Yellow Jacket
DRILLER NAME: Michael Anderson

DRILLING METHOD AND EQUIPMENT USED: Sonication (Sonic), Terrasonic Rig 150CC
OUTER DIA : 6 (in) **INNER DIA:** 4 (in)
WATER LEVEL: 11.3 (ft bgs)
TOTAL WELL DEPTH: 29 (ft)
START: February 18, 2023 **END:** February 18, 2023



Single Well Below Ground Surface

1 – **Ground elevation at well:** 15.54 ft

2 – **Top of casing elevation**: 15.39 ft

3 – **Wellhead Cover:** 0 **(ft)**, Steel, Flush Mounted
- a) **Concrete Pad Length (ft**): 2
- b) **Concrete Pad Width (ft):** 2
- c) **Concrete Pad Depth (ft):** 1

4 – **Well Casing (in):** 2 / Schedule 40 PVC

5 – **Well Screen (in):** 0.02 / Factory slotted
Screen Interval (ft): 9 - 29

6/7 – **Type screen filter**: #8/13
- a) **Quantity:** 10

8 – **Type of seal (in):** 3/8”
- a) **Quantity:** 3

9 – **Grout Mixture**: 0
Amount of Cement Used:
- a) **Amount of bentonite used:**
- b) **Amount of water used (gal):**
- c) **Method of placement:**
- d) **Vol. of well casing grout (gal):**

10 – **End Cap**: Schedule 40 PVC, 4 **(in)**, Flat

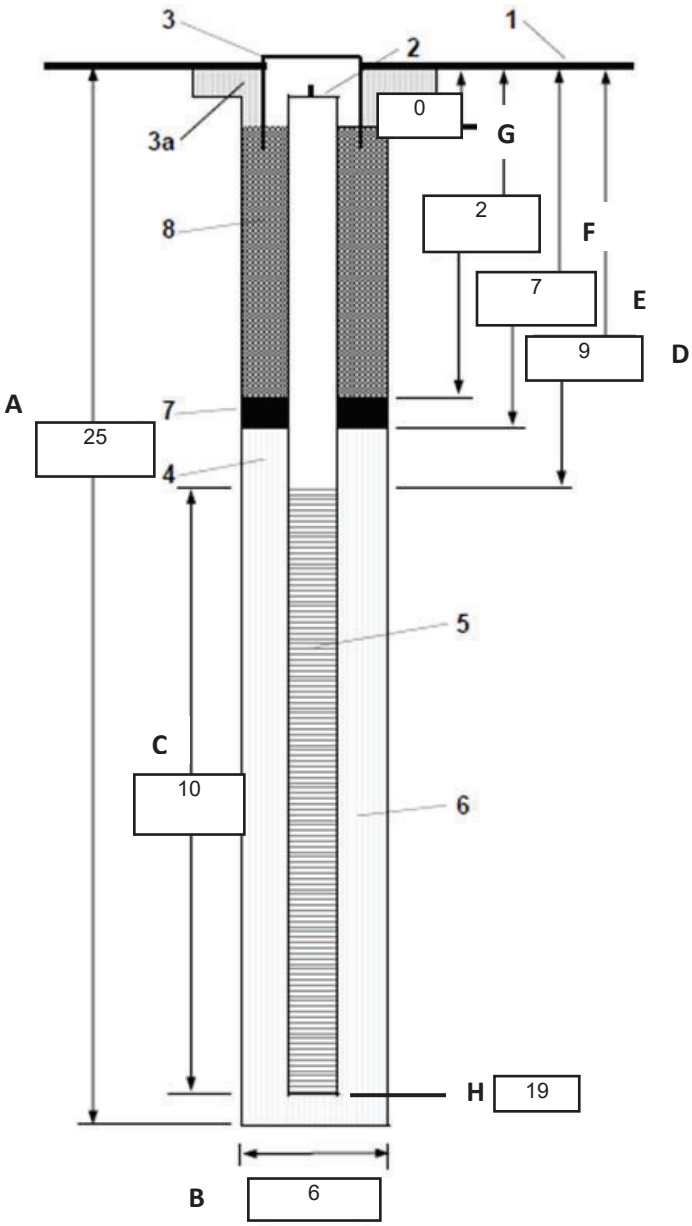
Comments:

A= Boring Depth (feet)
B= Borehole Diameter (inches)
C= Length of Screen (feet)
D= Depth to Top of Screen (feet)
E= Top of Sand Pack (feet)
F= Top of Annular Seal (feet)
G= Top of Grout Seal (feet)
H= Bottom of Screen (feet)

Jacobs	PROJECT NUMBER: 704758CH.05.06.FI	WELL NUMBER: NBKK-S7-MW04
	WELL COMPLETION DIAGRAM	

PROJECT: Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington
INSTALLATION: KEYPORT_NUWC
SITE: Site 7
LOGGER: Ilka Dinkelman
DRILLING CONTRACTOR: Yellow Jacket
DRILLER NAME: Michael Anderson

DRILLING METHOD AND EQUIPMENT USED: Sonication (Sonic), Terrasonic Rig 150CC
OUTER DIA : 6 (in) **INNER DIA:** 4 (in)
WATER LEVEL: 10.8 (ft bgs)
TOTAL WELL DEPTH: 19 (ft)
START: October 25, 2022 **END:** October 25, 2022



Single Well Below Ground Surface

1 – **Ground elevation at well:** 16.08 ft

2 – **Top of casing elevation**: 15.88 ft

3 – **Wellhead Cover:** 0 **(ft)**, Steel, Flush Mounted
- a) **Concrete Pad Length (ft**): 2
- b) **Concrete Pad Width (ft):** 2
- c) **Concrete Pad Depth (ft):** 1

4 – **Well Casing (in):** 2 / Schedule 40 PVC

5 – **Well Screen (in):** 0.02 / Factory slotted
Screen Interval (ft): 9 - 19

6/7 – **Type screen filter**: #8/12
- a) **Quantity:** 5

8 – **Type of seal (in):** 3/8”
- a) **Quantity:** 4

9 – **Grout Mixture**: 0
Amount of Cement Used: 0
- a) **Amount of bentonite used:** 0
- b) **Amount of water used (gal):**
- c) **Method of placement:**
- d) **Vol. of well casing grout (gal):**

10 – **End Cap**: Schedule 40 PVC, 4 **(in)**, Flat

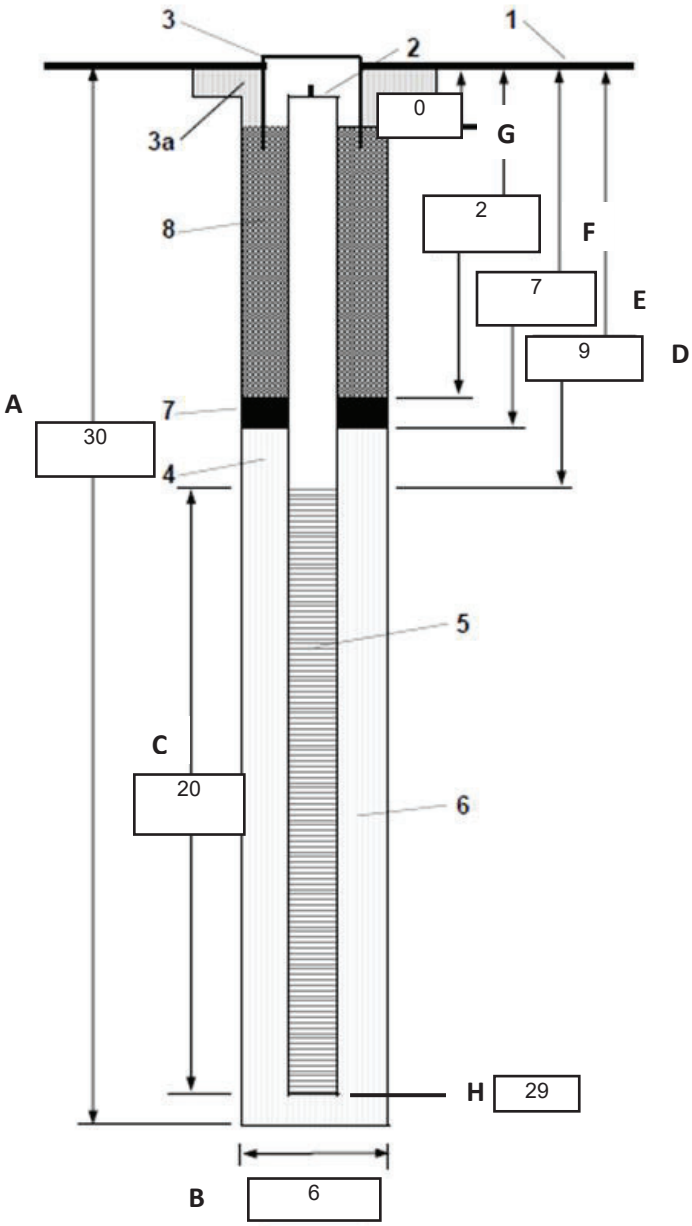
Comments:

A= Boring Depth (feet)
B= Borehole Diameter (inches)
C= Length of Screen (feet)
D= Depth to Top of Screen (feet)
E= Top of Sand Pack (feet)
F= Top of Annular Seal (feet)
G= Top of Grout Seal (feet)
H= Bottom of Screen (feet)

Jacobs	PROJECT NUMBER: 704758CH.05.06.FI	WELL NUMBER: NBKK-S7-MW05
	WELL COMPLETION DIAGRAM	

PROJECT: Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington
INSTALLATION: KEYPORT_NUWC
SITE: Site 7
LOGGER: Ilka Dinkelman
DRILLING CONTRACTOR: Yellow Jacket
DRILLER NAME: Michael Anderson

DRILLING METHOD AND EQUIPMENT USED: Sonication (Sonic), Terrasonic Rig 150 CC
OUTER DIA : 6 (in) **INNER DIA:** 4 (in)
WATER LEVEL: 10.5 (ft bgs)
TOTAL WELL DEPTH: 29 (ft)
START: October 26, 2022 **END:** October 26, 2022



Single Well Below Ground Surface

1 – **Ground elevation at well:** 15.68 ft

2 – **Top of casing elevation**: 15.31 ft

3 – **Wellhead Cover:** 0 **(ft)**, Steel, Flush Mounted
- a) **Concrete Pad Length (ft**): 2
- b) **Concrete Pad Width (ft):** 2
- c) **Concrete Pad Depth (ft):** 1

4 – **Well Casing (in):** 2 / Schedule 40 PVC

5 – **Well Screen (in):** 0.02 / Factory slotted
Screen Interval (ft): 9 - 29

6/7 – **Type screen filter**: #8/12
- a) **Quantity:** 12

8 – **Type of seal (in):** 3/8”
- a) **Quantity:** 4

9 – **Grout Mixture**: 0
Amount of Cement Used: 0
- a) **Amount of bentonite used:** 0
- b) **Amount of water used (gal):** 0
- c) **Method of placement:** 0
- d) **Vol. of well casing grout (gal):** 0

10 – **End Cap**: Schedule 40 PVC, 4 **(in)**, Flat

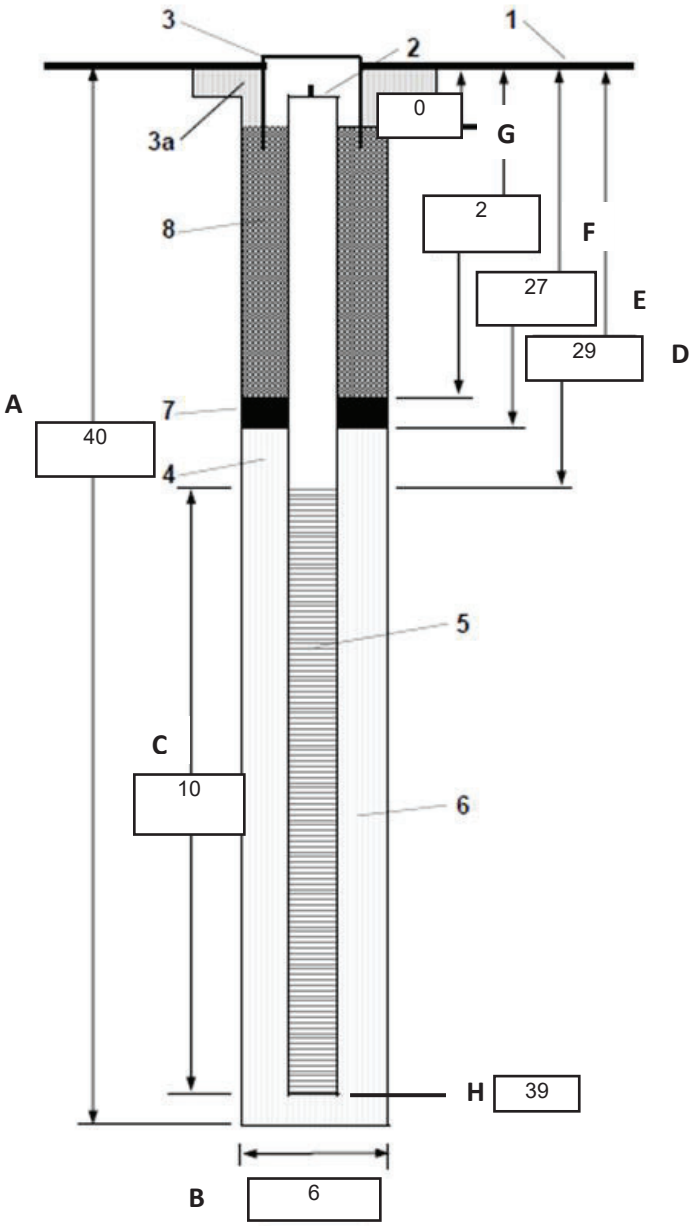
Comments:

A= Boring Depth (feet)
B= Borehole Diameter (inches)
C= Length of Screen (feet)
D= Depth to Top of Screen (feet)
E= Top of Sand Pack (feet)
F= Top of Annular Seal (feet)
G= Top of Grout Seal (feet)
H= Bottom of Screen (feet)

Jacobs	PROJECT NUMBER: 704758CH.05.06.FI	WELL NUMBER: NBKK-LFEX-MW01
	WELL COMPLETION DIAGRAM	

PROJECT: Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington
INSTALLATION: KEYPORT_NUWC
SITE: Landfill Extension
LOGGER: Ilka Dinkelman, Griffin Riley
DRILLING CONTRACTOR: Yellow Jacket
DRILLER NAME: Michael Anderson

DRILLING METHOD AND EQUIPMENT USED: Sonication (Sonic), Terrasonic 150CC
OUTER DIA : 6 (in) **INNER DIA:** 4 (in)
WATER LEVEL: 11.74 (ft bgs)
TOTAL WELL DEPTH: 39 (ft bgs)
START: October 6, 2022 **END:** October 6, 2022



1 – **Ground elevation at well (ft asml):** 24.55

2 – **Top of casing elevation (ft asml)**: 24.10

3 – **Wellhead Cover:** 0 **(ft)**, Steel, Flush Mounted
- a) **Concrete Pad Length (ft**): 2
- b) **Concrete Pad Width (ft):** 2
- c) **Concrete Pad Depth (ft):** 0.5

4 – **Well Casing (in):** 2" / Schedule 40 PVC

5 – **Well Screen (in):** 0.02" / Factory slotted
Screen Interval (ft): 29 - 39

6/7 – **Type screen filter**: #12/20 silica sand
- a) **Quantity (lbs):** 300

8 – **Type of seal (in):** 3/8" Bentonite Chips
- a) **Quantity (lbs):** 350

9 – **Grout Mixture**: NA
Amount of Cement Used:
- a) **Amount of bentonite used:**
- b) **Amount of water used (gal):**
- c) **Method of placement:**
- d) **Vol. of well casing grout (gal):**

10 – **End Cap**: Schedule 40 PVC, 2" Dia x 4" Long

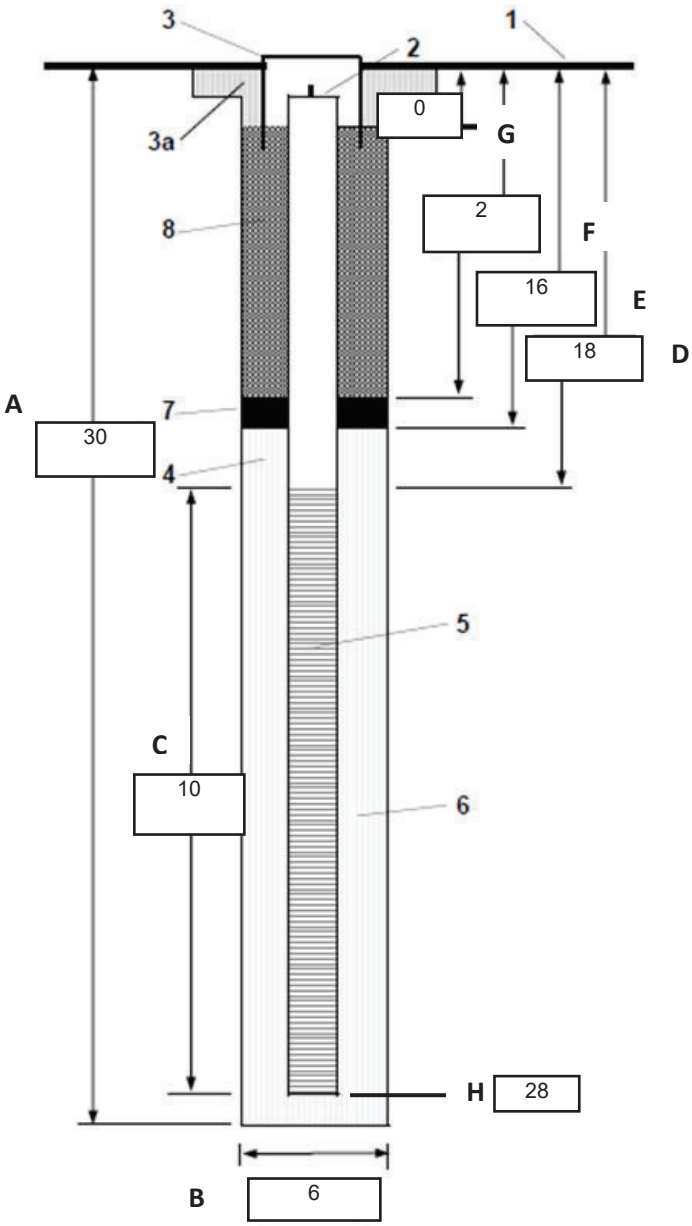
Comments:

A= Boring Depth (feet)
B= Borehole Diameter (inches)
C= Length of Screen (feet)
D= Depth to Top of Screen (feet)
E= Top of Sand Pack (feet)
F= Top of Annular Seal (feet)
G= Top of Grout Seal (feet)
H= Bottom of Screen (feet)

Jacobs	PROJECT NUMBER: 704758CH.05.06.FI	WELL NUMBER: NBKK-LFEX-MW02
	WELL COMPLETION DIAGRAM	

PROJECT: Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington
INSTALLATION: KEYPORT_NUWC
SITE: Landfill Extension
LOGGER: Ilka Dinkelman, Griffin Riley
DRILLING CONTRACTOR: Yellow Jacket
DRILLER NAME: Michael Anderson

DRILLING METHOD AND EQUIPMENT USED: Sonication (Sonic), Terrasonic 150CC
OUTER DIA : 6 (in) **INNER DIA:** 4 (in)
WATER LEVEL: 10.89 (ft bgs)
TOTAL WELL DEPTH: 28 (ft)
START: October 5, 2022 **END:** October 5, 2022



1 – **Ground elevation at well (ft asml):** 21.98

2 – **Top of casing elevation (ft asml)**: 21.60

3 – **Wellhead Cover:** 0 **(ft)**, Steel, Flush Mounted
- a) **Concrete Pad Length (ft**): 2
- b) **Concrete Pad Width (ft):** 2
- c) **Concrete Pad Depth (ft):** 0.5

4 – **Well Casing (in):** 2" / Schedule 40 PVC

5 – **Well Screen (in):** 0.02" / Factory slotted
Screen Interval (ft): 18 - 28

6/7 – **Type screen filter**: #12/20 silica sand
- a) **Quantity (lbs):** 450

8 – **Type of seal (in):** 3/8" Bentonite Chips
- a) **Quantity (lbs):** 250

9 – **Grout Mixture**:
Amount of Cement Used:
- a) **Amount of bentonite used:**
- b) **Amount of water used (gal):**
- c) **Method of placement:**
- **d) Vol. of well casing grout (gal):**

10 – **End Cap**: Schedule 40 PVC, 2" Dia x 4" Long

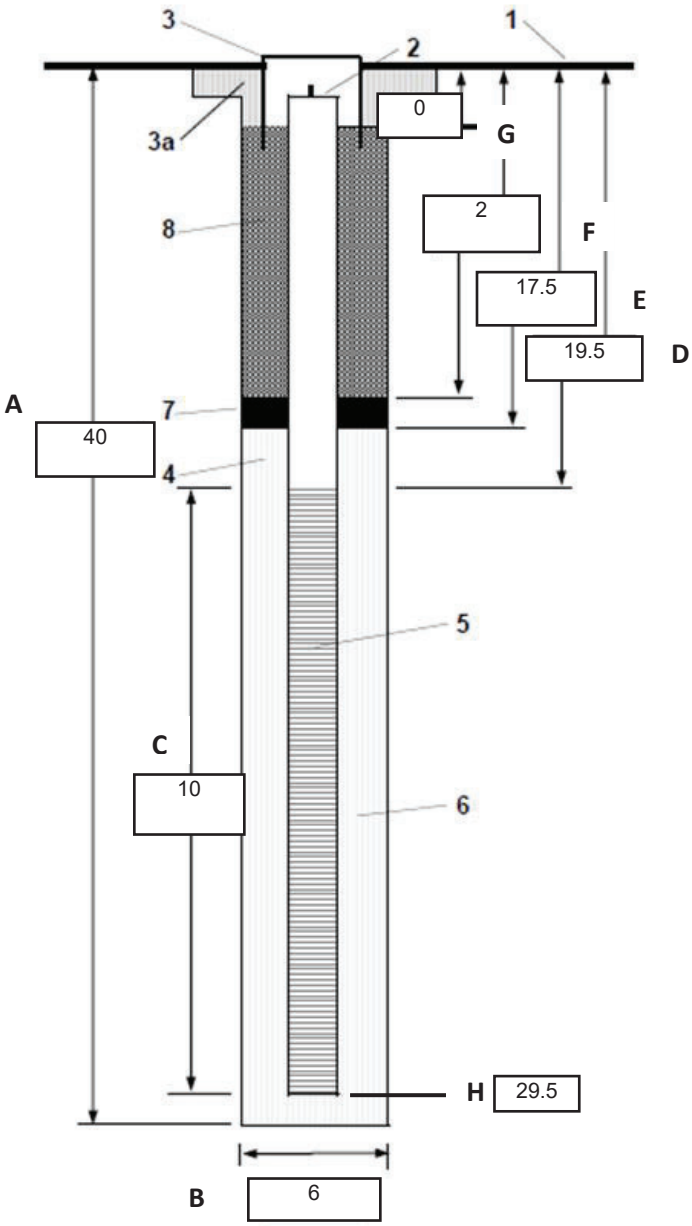
Comments:

A= Boring Depth (feet)
B= Borehole Diameter (inches)
C= Length of Screen (feet)
D= Depth to Top of Screen (feet)
E= Top of Sand Pack (feet)
F= Top of Annular Seal (feet)
G= Top of Grout Seal (feet)
H= Bottom of Screen (feet)

Jacobs	PROJECT NUMBER: 704758CH.05.06.FI	WELL NUMBER: NBKK-LFEX-MW03
	WELL COMPLETION DIAGRAM	

PROJECT: Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington
INSTALLATION: KEYPORT_NUWC
SITE: Landfill Extension
LOGGER: Ilka Dinkelman, Griffin Riley
DRILLING CONTRACTOR: Yellow Jacket
DRILLER NAME: Michael Anderson

DRILLING METHOD AND EQUIPMENT USED: Sonication (Sonic), Terrasonic 150CC
OUTER DIA : 6 (in) **INNER DIA:** 4 (in)
WATER LEVEL: 10.89 (ft bgs)
TOTAL WELL DEPTH: 29.5 (ft bgs)
START: October 5, 2022 **END:** October 5, 2022



1 – **Ground elevation at well (ft asml):** 20.13

2 – **Top of casing elevation (ft asml)**: 19.73

3 – **Wellhead Cover:** 0 **(ft)**, Steel, Flush Mounted
a) **Concrete Pad Length (ft**): 2
b) **Concrete Pad Width (ft):** 2
c) **Concrete Pad Depth (ft):** 0.5

4 – **Well Casing (in):** 2" / Schedule 40 PVC

5 – **Well Screen (in):** 0.02" / Factory slotted
Screen Interval (ft): 19.5 - 29.5

6/7 – **Type screen filter**: #12/20
a) Quantity (lbs): 500

8 – **Type of seal (in):** 3/8" Bentonite Chips
a) **Quantity (lbs):** 350

9 – **Grout Mixture**: NA
Amount of Cement Used:
a) **Amount of bentonite used:**
b) **Amount of water used (gal):**
c) **Method of placement:**
d) **Vol. of well casing grout (gal):**

10 – **End Cap**: Schedule 40 PVC, 2" Dia x 4" Long

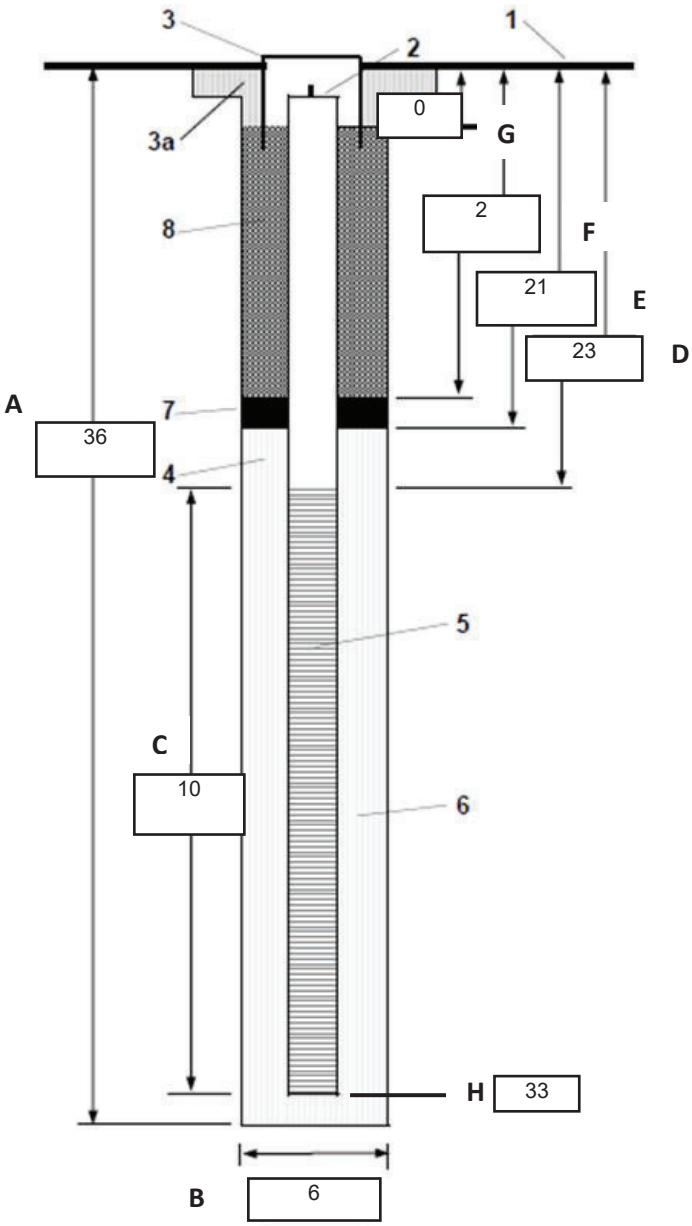
Comments:

A= Boring Depth (feet)
B= Borehole Diameter (inches)
C= Length of Screen (feet)
D= Depth to Top of Screen (feet)
E= Top of Sand Pack (feet)
F= Top of Annular Seal (feet)
G= Top of Grout Seal (feet)
H= Bottom of Screen (feet)

Jacobs	PROJECT NUMBER: 704758CH.05.06.FI	WELL NUMBER: NBKK-LFEX-MW04
	WELL COMPLETION DIAGRAM	

PROJECT: Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington
INSTALLATION: KEYPORT_NUWC
SITE: Landfill Extension
LOGGER: Ilka Dinkelman, Griffin Riley, Tommy Ta
DRILLING CONTRACTOR: Yellow Jacket
DRILLER NAME: Michael Anderson

DRILLING METHOD AND EQUIPMENT USED: Sonication (Sonic), Terrasonic 150CC
OUTER DIA : 6 (in) **INNER DIA:** 4 (in)
WATER LEVEL: 13.14 (ft bgs)
TOTAL WELL DEPTH: 33 (ft bgs)
START: October 8, 2022 **END:** October 8, 2022



1 – **Ground elevation at well (ft asml):** 23.27

2 – **Top of casing elevation (ft asml)**: 23.02

3 – **Wellhead Cover:** 0 **(ft)**, Steel, Flush Mounted
- a) **Concrete Pad Length (ft**): 2
- b) **Concrete Pad Width (ft):** 2
- c) **Concrete Pad Depth (ft):** 0.5

4 – **Well Casing (in):** 2 / Schedule 40 PVC

5 – **Well Screen (in):** 0.02 / Factory slotted
Screen Interval (ft): 23 - 33

6/7 – **Type screen filter**: #12/20 silica sand
- a) **Quantity (lbs):** 350

8 – **Type of seal (in):** 3/8" Bentonite Chips
- a) **Quantity (lbs):** 300

9 – **Grout Mixture**: NA
Amount of Cement Used:
- a) **Amount of bentonite used:**
- b) **Amount of water used (gal):**
- c) **Method of placement:**
- d) **Vol. of well casing grout (gal):**

10 – **End Cap**: Schedule 40 PVC, 2" Dia x 4" Long

Comments:

A= Boring Depth (feet)
B= Borehole Diameter (inches)
C= Length of Screen (feet)
D= Depth to Top of Screen (feet)
E= Top of Sand Pack (feet)
F= Top of Annular Seal (feet)
G= Top of Grout Seal (feet)
H= Bottom of Screen (feet)

Appendix D
Well Development Logs

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WELL DEVELOPMENT LOG

WELL ID: NBKK-B76-MW01

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington			Well Depth:	40	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm), **H2S:** 0 (ppm), **LEL:** 0 %, **CO:** 0 (ppm), **O2:** 20.9 %	Start Water Level:	12.4	Ft btoc
Event Date:	November 4, 2022 6:23 PM			Water Column:	27.6	Ft
Development Team:	Charlie Royko			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Stability			Well Volume:	4.5	Gal
Equipment:	Submersible Pump, YSI, Turbidity Meter, MultiRAE,			Start Time:	16:23	
				End Time:	17:20	
				Total Volume Purged:	55	Gal
Tubing Materials:	5/8" Poly Tubing			Screened Interval:	29-39	Ft bgs
				Pumping/Tube Intake:	34	Ft bgs

WELL STABILIZATION DATA

Time	Pumping rate (gal/min)	Volume Removed (gal)	Water level (ft)	pH (SU)	SP. COND. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Clarity/Color
16:24	1	0	20.94	8.21	1.11	15	-50.3	3.6	1,000	Cloudy
16:29	1	5	21.48	8.23	1.11	15	-89.6	1.82	1,000	Cloudy
16:34	1	5	21.93	8.22	1.11	15	-118.4	0.86	1,000	Cloudy
16:39	1	5	22.22	8.21	1.11	14.9	-131.9	0.65	1,000	Cloudy
16:44	1	5	22.55	8.21	1.11	14.9	-141.3	0.57	1,000	Cloudy
16:49	1	5	22.79	8.2	1.11	14.9	-148.2	0.53	516	Cloudy
16:54	1	5	23.02	8.19	1.1	14.9	-153.8	0.5	172	Cloudy

16:59	1	5	23.14	8.19	1.11	14.9	-158.5	0.48	122	Clear
17:03	1	4	23.38	8.18	1.11	14.9	-162.2	0.47	106	Clear
17:08	1	5	23.59		1.11	14.8	-165.1	0.46	60	Clear
17:12	1	4	23.77	8.18	1.11	14.8	-166.7	0.46	50	Clear
17:16	1	4	23.71	8.18	1.11	14.8	-168.2	0.46	46.9	Clear
17:19	1	3	23.77	8.18	1.11	14.8	-169.1	0.46	35.8	Clear

Legend: gal/min= gallons per minute **SU**= Standard Units **mS/cm** = millisiemens per centimeter **mL/min**= milliliters per minute **mL**= milliliters **mV**= millivolts **mg/L**= micrograms per liter **NTU**= Nephelometric Turbidity Unit **btoc=** below top of casing **Ft**=feet **°C**=Degrees Centigrade **mg/L** =milligrams per Liter **OD** = outer diameter **ID** = Inner Diameter **In**= inches

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WELL DEVELOPMENT LOG

WELL ID: NBKK-B76-MW02

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington			Well Depth:	57.75	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm), **H2S:** 0 (ppm), **LEL:** 0 %, **CO:** 0 (ppm), **O2:** 20.9 %	Start Water Level:	14.95	Ft btoc
Event Date:	November 5, 2022 12:27 PM			Water Column:	42.8	Ft
Development Team:	Charlie Royko			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Stability			Well Volume:	6.98	Gal
Equipment:	Submersible Pump, YSI, Turbidity Meter, MultiRAE,			Start Time:	11:00	
				End Time:	14:10	
				Total Volume Purged:	132	Gal
Tubing Materials:	5/8" Poly Tubing			Screened Interval:	49-59	Ft bgs
				Pumping/Tube Intake:	54	Ft bgs

WELL STABILIZATION DATA

Time	Pumping rate (gal/min)	Volume Removed (gal)	Water level (ft)	pH (SU)	SP. COND. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Clarity/Color
11:00	1	0	NR	6.73	1.15	14.1	-248	0.55	1,000	Cloudy
11:05	1	5	28	8.64	1.13	14.3	-350	0.44	1,000	Cloudy
11:10	1	5	28.81	8.59	1.13	14	-310.9	0.55	1,000	Cloudy
11:15	1	5	28.82	8.53	1.13	14.3	-359	0.52	1,000	Cloudy
11:19	1	4	28.3	8.52	1.13	14.3	-362.4	0.49	1,000	Cloudy
11:24	1	5	28.75	8.5	1.12	14.4	-367.1	0.48	1,000	Cloudy
11:29	1	5	28.8	8.48	1.11	14.3	-373	0.47	1,000	Cloudy

11:34	1	5	28.85	8.46	1.11	14.4	-369	0.92	999	Cloudy
11:39	1	5	29.01	8.45	1.11	14.5	-381.4	0.49	999	Cloudy
11:43	1	4	29.1	8.45	1.12	14.1	-370.3	0.5	999	Cloudy
11:48	1	5	29.29	8.43	1.11	14.4	-362.1	0.51	999	Cloudy
11:58	1	10	28.9	8.41	1.11	14.5	-360	0.52	999	Cloudy
12:05	1	7	NR	8.39	1.12	14.4	-360.1	0.5	999	Cloudy
12:25	1	20	28.61	8.37	1.14	14.4	-325	0.51	999	Cloudy
12:30	1	5	NR	8.36	1.14	14.3	-344	0.43	1,000	Cloudy
12:36	1	6	28.83	8.37	1.14	14.2	-373	0.39	1,000	Cloudy
13:09	0	0	29.6	8.28	1.13	14.2	-269.1	0.64	338	Clear
13:12	0.8	2.4	29.6	8.28	0.91	14.4	-300	0.6	261	Cloudy
13:15	0.8	2.4	30.32	8.28	0.91	14.4	-301	0.55	128	Clear
13:20	0.8	4	30.35	8.32	0.91	14.4	-312.1	0.48	109	Clear
13:25	0.8	4	NR	8.29	0.92	14.2	-295.7	0.57	136	Clear

13:29	0.8	3.2	NR	8.3	0.91	14	-300	0.53	117	Clear
13:34	0.8	4	30.65	8.31	0.91	13.8	-301	0.51	186	Cloudy
13:38	0.8	3.2	NR	8.27	0.91	13.8	-300	0.51	157	Clear
13:47	0.8	7.2	30.79	8.27	0.91	13.5	-294	0.73	NR	Clear
14:01	0	0	NR	8.26	0.91	13.8	220	0.73	84	Clear
14:04	1	3	33	8.27	0.91	13.9	-239	0.73	47.2	Clear
14:07	1	3	33.2	8.28	0.91	13.9	-243.1	0.73	22.3	Clear
14:10	1	NR	NR	8.28	0.91	13.9	-245	0.73	19.2	Clear

Legend: gal/min= gallons per minute **SU**= Standard Units **mS/cm** = millisiemens per centimeter **mL/min**= milliliters per minute **mL**= milliliters **mV**= millivolts **mg/L**= micrograms per liter **NR** = not recorded **NTU**= Nephelometric Turbidity Unit **btoc=** below top of casing **Ft**=feet **°C**=Degrees Centigrade **mg/L** =milligrams per Liter **OD** = outer diameter **ID** = Inner Diameter **In**= inches

JACOBS

WELL DEVELOPMENT LOG

WELL ID: NBKK-B76-MW03

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington			Well Depth:	43	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm), **H2S:** 0 (ppm), **LEL:** 0 %, **CO:** 0 (ppm), **O2:** 20.9 %	Start Water Level:	8.63	Ft btoc
Event Date:	November 8, 2022 11:34 AM			Water Column:	34.37	Ft
Development Team:	Tommy Ta, Tim Anderson			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Stability			Well Volume:	5.61	Gal
Equipment:	Submersible Pump, YSI, Turbidity Meter, MultiRAE,			Start Time:	10:36	
				End Time:	12:25	
				Total Volume Purged:	104	Gal
Tubing Materials:	5/8" Poly Tubing			Screened Interval:	34-44	Ft bgs
				Pumping/Tube Intake:	40	Ft bgs

WELL STABILIZATION DATA

Time	Pumping rate (gal/min)	Volume Removed (gal)	Water level (ft)	pH (SU)	SP. COND. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Clarity/Color
10:37	1	0	24.78	8.13	0.436	13.9	NR	0.98	522	Clear
11:02	1	25	33.5	8.43	0.448	14	NR	0.9	157	Clear
11:16	1	14	33.63	8.05	0.447	14.2	NR	1.22	208	Clear
11:19	1	NR	NR	8.18	0.442	14.5	NR	2.02	999	Grey
12:23	1	64	30.72	8.38	0.428	14.4	NR	5.47	277	Clear
12:24	1	1	36.31	8.38	0.433	14.6	NR	5.47	149	Cloudy

Legend: gal/min= gallons per minute **SU**= Standard Units **mS/cm** = millisiemens per centimeter **mL/min**= milliliters per minute **mL**= milliliters **mV**= millivolts **mg/L**= micrograms per liter **NR** = not recorded **NTU**= Nephelometric Turbidity Unit **btoc=** below top of casing **Ft**=feet **°C**=Degrees Centigrade **mg/L** =milligrams per Liter **OD** = outer diameter **ID** = Inner Diameter **In**= inches

JACOBS

WELL DEVELOPMENT LOG

WELL ID: NBKK-B76-MW04

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington			Well Depth:	69.00	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm), **H2S:** 0 (ppm), **LEL:** 0 %, **CO:** 0 (ppm), **O2:** 20.9 %	Start Water Level:	29.23	Ft btoc
Event Date:	November 7, 2022 3:18 PM			Water Column:	39.77	Ft
Development Team:	Tommy Ta, Tim Anderson			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Stability			Well Volume:	64.23	Gal
Equipment	Bailer, Surge Block, YSI, Turbidity Meter, MultiRAE 3540			Start Time:	12:18	
				End Time:	15:50	
				Total Volume Purged:	452	Gal
Tubing Materials:	5/8" Poly Tubing			Screened Interval:	59-69	Ft bgs
				Pumping/Tube Intake:	50	Ft bgs

WELL STABILIZATION DATA

Time	Pumping rate (gal/min)	Volume Removed (gal)	Water level (ft)	pH (SU)	SP. COND. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Clarity/Color
12:18	1	0	24.22	8.72	0.597	13.8	-147.1	2.21	999	Grey
12:33	1	3.75	24.22	8.55	0.601	13.7	-163.6	1.46	861.39	Grey
12:53	1	6.6	24.22	8.47	0.608	13.8	-191.5	0.95	827.23	Grey
13:19	1.5	8.58	24.22	8.43	0.612	13.9	-208.4	0.69	999	Grey
13:30	2	22	NR	8.17	0.63	14.1	-204.6	0.63	999	Grey
13:40	3	30	24	8.2	0.64	14	-137.3	0.59	389	Cloudy
15:22	3	306	27.64	8.26	0.619	14.1	-127.6	2.76	377	Grey

15:47	3	75	29.23	8.16	0.626	13.7	-181.9	0.53	372	Cloudy

Legend: gal/min= gallons per minute **SU**= Standard Units **mS/cm** = millisiemens per centimeter **mL/min**= milliliters per minute **mL**= milliliters **mV**= millivolts **mg/L**= micrograms per liter **NR** = not recorded **NTU**= Nephelometric Turbidity Unit **btoc=** below top of casing **Ft**=feet **°C**=Degrees Centigrade **mg/L** =milligrams per Liter **OD** = outer diameter **ID** = Inner Diameter **In**= inches

JACOBS GROUNDWATER SAMPLING DATA SHEET

WELL ID: NBKK-B76-MW06

Project Name:	NBK Keyport, Additional Investigation (Building 76)	Casing Materials:	PVC	Well Depth:	32.30	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm)	Start Water Level:	11.22	Ft btoc
Start Date:	August 14, 2023	Weather:	Sunny , 83 F	Water Column:	21.10	Ft
Sampling Team:	Lyndsey Kleppin, Tommy Ta			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Low Flow			Well Volume:	3.44	Gal
Equipment	Peristaltic Pump, Geopump YSI (C103140), Turbidity Meter, MultiRAE (# 23801)			Start Time:	12:51	
				End Time:	15:30	
				Total Volume Purged:	Approximately 5.50	Gal
Tubing Materials:	HDPE, Flex Tubing 1/4 inch					
				Screened Interval:	22 - 32	Ft-bgs
				Pumping/Tube Intake:	27	Ft btoc

Diam (in.)	Vol. (gal/ft)
1	0.041
1.25	0.064
2	0.163
4	0.653

Notes:
(mL/min) = milliliters per minute
(SU) = Standard Units
(mS/cm) = milliSiemens per centimeter
(mV) = Millivolts
(mg/L) = Milligrams per liter
(NTU) = Nephelometric Turbidity Unit

WELL STABILIZATION DATA

Time	Pumping Rate (mL/min)	Water level (ft)	pH (SU)	SP. Cond. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Appearance
12:56	250	12.66	7.44	0.304	14.30	-123.30	1.08	314.00	
13:01	250	13.01	7.42	0.305	14.10	-129.50	0.95	163.00	Cloudy White
13:06	225	13.14	7.46	0.313	14.40	-155.60	0.64	108.00	Cloudy White
13:14	225	13.25	7.52	0.314	14.20	-169.80	0.52	97.50	Cloudy White
13:20	225	13.30	7.55	0.317	14.60	-181.40	0.46	55.60	Cloudy White
13:25	225	13.21	7.59	0.318	14.80	-188.20	0.44	57.20	Cloudy White
13:29	225	13.24	7.61	0.320	14.50	-194.50	0.41	55.10	Cloudy White

WELL STABILIZATION DATA									
Time	**Pumping Rate (mL/min)**	**Water level (ft)**	**pH (SU)**	**SP. Cond. (mS/cm)**	**Temp. (°C)**	**ORP (mV)**	**D.O. (mg/L)**	**Turbidity (NTU)**	**Appearance**
13:35	225	13.35	7.60	0.320	14.40	-199.50	0.39	44.70	Clear
13:40	225	13.40	7.63	0.319	14.40	-203.40	0.37	33.10	Clear
13:46	225	13.48	7.62	0.319	14.50	-206.50	0.35	49.40	Clear
13:51	225	13.45	7.69	0.322	14.90	-213.20	0.34	33.70	Clear
13:56	225	13.44	7.72	0.321	14.90	-219.60	0.34	32.30	Clear
14:01	225	13.49	7.73	0.321	14.90	-221.10	0.32	26.40	Clear
14:06	225	13.50	7.73	0.323	14.80	-224.90	0.32	31.60	Clear
14:16	225	13.48	7.81	0.323	15.30	-224.30	0.30	22.60	Clear
14:23	225	13.42	7.87	0.325	15.60	-230.00	0.28	22.60	Clear
14:29	225	13.31	7.00	0.326	15.90	-233.90	0.28	16.20	Clear
14:38	225	13.28	7.91	0.324	16.70	-236.60	0.28	12.40	Clear
14:45	225	13.25	7.90	0.327	15.90	-241.60	0.29	9.79	Clear
14:58	225	13.23	7.83	0.327	16.20	-242.20	0.25	10.10	Clear
15:06	225	13.29	7.89	0.326	16.10	-247.00	0.25	8.58	Clear
15:13	225	13.27	7.91	0.327	16.20	-246.70	0.25	8.35	Clear

SAMPLE INFORMATION

Sample ID:	NBKK-B76-MW06-0823	Primary Laboratory:	Battelle
Analyses:	PFAS (list of 18)	Shipment Method:	Fed-Ex
Collection Date/Time:	08/14/23 / 15:17	QC Sample:	YES
Sample Comments:	None	QC Sample ID:	NBKK-B76-MW06P0823

JACOBS GROUNDWATER SAMPLING DATA SHEET

WELL ID: NBKK-B76-MW07

Project Name:	NBK Keyport, Additional Investigation (Building 76)	Casing Materials:	PVC	Well Depth:	33.40	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm) **VOC:** 0 (ppm)	Start Water Level:	15.29	Ft btoc
Start Date:	August 15, 2023	Weather:	Sunny , 86 F	Water Column:	18.11	Ft
Sampling Team:	Lyndsey Kleppin, Tommy Ta			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Low Flow			Well Volume:	2.95	Gal
Equipment	Peristaltic Pump, Geopump (C-103198), YSI (C-103140), Turbidity Meter, MultiRAE (#23801)			Start Time:	13:00	
				End Time:	14:00	
				Total Volume Purged:	Approximately 2.50	Gal
Tubing Materials:	HDPE, Flex Tubing ¼ inch					
				Screened Interval:	23 - 33	Ft-bgs
				Pumping/Tube Intake:	28	Ft btoc

Diam (in.)	Vol. (gal/ft)
1	0.041
1.25	0.064
2	0.163
4	0.653

Notes:
(mL/min) = milliliters per minute
(SU) = Standard Units
(mS/cm) = milliSiemens per centimeter
(mV) = Millivolts
(mg/L) = Milligrams per liter
(NTU) = Nephelometric Turbidity Unit

WELL STABILIZATION DATA

Time	Pumping Rate (mL/min)	Water level (ft)	pH (SU)	SP. Cond. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Appearance
13:00	200	16.89	6.68	0.900	16.60	-4.90	0.48	13.60	Clear
13:15	200	16.93	6.64	0.900	17.40	-6.60	0.15	7.61	Clear
13:23	200	17.00	6.64	0.900	17.10	-17.30	0.10	7.73	Clear
13:31	200	17.00	6.66	0.900	17.40	-20.40	0.10	6.47	Clear
13:38	200	17.23	6.68	0.890	16.30	-25.60	0.15	4.99	Clear
13:48	200	17.28	6.69	0.900	17.10	-28.70	0.13	3.71	Clear

SAMPLE INFORMATION			
Sample ID:	NBKK-B76-MW07-0823	Primary Laboratory:	Battelle
Analyses:	PFAS (list of 18)	Shipment Method:	Fed-Ex
Collection Date/Time:	08/15/23 / 13:51	QC Sample:	N/A
Sample Comments:	None	QC Sample ID:	N/A

JACOBS GROUNDWATER SAMPLING DATA SHEET

WELL ID: NBKK-B76-MW08

Project Name:	NBK Keyport, Additional Investigation (Building 76)	Casing Materials:	PVC	Well Depth:	35.02	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm)	Start Water Level:	20.56	Ft btoc
Start Date:	August 15, 2023	Weather:	Sunny , 72 F	Water Column:	14.46	Ft
Sampling Team:	Lyndsey Kleppin, Tommy Ta			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Low Flow			Well Volume:	2.35	Gal
Equipment	Peristaltic Pump, Geopump (C-103198) YSI (C-103104), Turbidity Meter, MultiRAE (#23801)			Start Time:	09:06	
				End Time:	10:00	
				Total Volume Purged:	Approximately 2.50	Gal
Tubing Materials:	HDPE, Flex Tubing ¼ inch					
				Screened Interval:	24 - 34	Ft-bgs
				Pumping/Tube Intake:	30	Ft btoc

Diam (in.)	Vol. (gal/ft)
1	0.041
1.25	0.064
2	0.163
4	0.653

Notes:
(mL/min) = milliliters per minute
(SU) = Standard Units
(mS/cm) = milliSiemens per centimeter
(mV) = Millivolts
(mg/L) = Milligrams per liter
(NTU) = Nephelometric Turbidity Unit

WELL STABILIZATION DATA

Time	Pumping Rate (mL/min)	Water level (ft)	pH (SU)	SP. Cond. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Appearance
09:15	200	21.26	6.50	2.430	14.40	-45.80	2.69	4.79	Clear
09:20	200	21.45	6.50	2.440	14.40	-49.90	2.76	5.34	Clear
09:26	200	21.52	6.52	2.450	14.20	-50.60	2.81	3.35	Clear
09:32	200	21.50	6.54	2.430	14.40	-55.70	2.72	3.57	Clear
09:37	200	21.68	6.56	2.430	14.30	-55.40	2.61	4.01	Clear
09:42	200	21.69	6.56	2.410	14.60	-54.60	2.52	3.24	Clear

SAMPLE INFORMATION			
Sample ID:	NBKK-B76-MW08-0823	Primary Laboratory:	Battelle
Analyses:	PFAS (list of 18)	Shipment Method:	Fed-Ex
Collection Date/Time:	08/15/23 / 09:49	QC Sample:	N/A
Sample Comments:	None	QC Sample ID:	N/A

JACOBS GROUNDWATER SAMPLING DATA SHEET

WELL ID: NBKK-B76-MW09

Project Name:	NBK Keyport, Additional Investigation (Building 76)	Casing Materials:	PVC	Well Depth:	29.42	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm)	Start Water Level:	18.30	Ft btoc
Start Date:	August 14, 2023	Weather:	Sunny , 90 F	Water Column:	11.12	Ft
Sampling Team:	Lyndsey Kleppin, Tommy Ta			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Low Flow			Well Volume:	1.81	Gal
Equipment	Peristaltic Pump, Geopump, 103198 YSI (C-103140), Turbidity Meter, MultiRAE (#23801)			Start Time:	14:35	
				End Time:	16:25	
				Total Volume Purged:	Approximately 5.0	Gal
Tubing Materials:	HDPE, Flex Tubing ¼ inch					
				Screened Interval:	18.63 - 28.63	Ft-bgs
				Pumping/Tube Intake:	24.20	Ft btoc

Diam (in.)	Vol. (gal/ft)
1	0.041
1.25	0.064
2	0.163
4	0.653

Notes:
(mL/min) = milliliters per minute
(SU) = Standard Units
(mS/cm) = milliSiemens per centimeter
(mV) = Millivolts
(mg/L) = Milligrams per liter
(NTU) = Nephelometric Turbidity Unit

WELL STABILIZATION DATA

Time	Pumping Rate (mL/min)	Water level (ft)	pH (SU)	SP. Cond. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Appearance
14:45	400	18.30	6.62	1.450	15.50	92.80	0.24	5.06	Clear
15:50	400	18.52	6.57	1.490	15.40	85.80	0.21	6.65	Clear
15:56	400	18.67	6.54	1.490	15.50	80.60	0.16	6.07	Clear
16:03	400	18.76	6.52	1.510	15.60	77.90	0.14	3.92	Clear
16:11	400	18.81	6.51	1.520	15.50	76.90	0.13	3.34	Clear

SAMPLE INFORMATION			
Sample ID:	NBKK-B76-MW09-0823	Primary Laboratory:	Battelle
Analyses:	PFAS (list of 18)	Shipment Method:	Fed-Ex
Collection Date/Time:	08/14/23 16:13	QC Sample:	YES
Sample Comments:	None	QC Sample ID:	NBKK-B76-MW09-0823-MS, NBKK-B76-MW09-0823-MSD

WELL DEVELOPMENT LOG

WELL ID: NBKK-CF1-MW01

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington			Well Depth:	63	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm), **H2S:** 0 (ppm), **LEL:** 0 %, **CO:** 0 (ppm), **O2:** 20.9 %	Start Water Level:	48	Ft btoc
Event Date:	November 14, 2022 6:15 PM			Water Column:	15	Ft
Development Team:	Nathan Leu, Tim Anderson			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Stability			Well Volume:	2.45	Gal
Equipment	Submersible Pump, YSI, Turbidity Meter, MultiRAE,			Start Time:	15:15 11/14	
				End Time:	14:41 11/15	
				Total Volume Purged:	372	Gal
Tubing Materials:	5/8" Poly Tubing			Screened Interval:	53-63	Ft bgs
				Pumping/Tube Intake:	56	Ft bgs

WELL STABILIZATION DATA

Time	Pumping rate (gal/min)	Volume Removed (gal)	Water level (ft)	pH (SU)	SP. COND. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Clarity/Color
15:15	0.25	0	58	7.67	379	13.5	-204	3.68	999	Brown
15:41	0.25	6.5	58	7.64	366.4	13.1	-170	3.68	999	Brown
15:43	0.25	0.5	58	7.6	341.4	13.3	-154.4	3.68	999	Brown
15:49	0.25	1.5	58	7.54	315.5	13.4	-146.1	7.54	999	Brown
15:51	0.25	0.5	58	7.49	2.98	13.1	-151.1	2.95	999	Brown
15:57	0.25	1.5	58	7.51	300.9	12.7	-148.4	3.2	999	Cloudy
16:01	0.25	1	58	7.5	310	12.9	-142.6	3.21	999	Cloudy

08:03	0.25	240.5	29.04	7.67	264.3	12.5	-193.1	6.86	999	Cloudy
08:28	0.25	6.25	29.9	7.71	267.9	11.8	-236.2	4.72	999	Cloudy
08:34	0.25	1.5	35.69	7.56	274.7	13.3	-222.6	2.81	999	Cloudy
08:41	0.25	1.75	36.42	7.56	266.5	12.4	-196.4	2.74	999	Cloudy
08:48	0.25	1.75	39.52	7.53	266.4	12.5	-202.5	2.78	999	Cloudy
08:52	0.25	1	41.6	7.59	284	13.4	-249.8	1.71	999	Cloudy
08:58	0.25	1.5	41.95	7.56	272.2	12.9	-227	1.79	999	Cloudy
09:04	0.25	1.5	47.5	7.53	274.3	14.1	-228.4	1.44	999	Cloudy
09:14	0.25	NR	49.15	7.52	262.3	13.6	-191.5	1.59	999	Cloudy
09:18	0.25	1	29.5	7.24	221.7	13.7	-117.4	4.61	754	Cloudy
10:48	0.25	22.5	47.6	7.26	233.4	13.5	-114.6	3.81	999	Cloudy
10:56	0.33	2.64	52.3	7.27	0.293	14	-108.3	3.18	999	Grey
11:57	0.33	20.13	53.87	7.28	0.305	14	-111.1	3.07	999	Cloudy
13:05	0.33	22.44	31.03	7.22	0.26	13.9	-98.4	6.12	455	Cloudy

13:11	0.33	1.98	45.25	7.24	0.267	13.6	-102.1	4.72	454	Cloudy
13:15	0.25	1	47.05	7.22	0.28	13.4	-107.6	3.86	435	Cloudy
14:26	0.33	23.43	31.28	7.07	0.288	14	-90.8	3.37	669	Cloudy
14:40	0.33	4.62	37.59	7.17	0.265	14.1	-107.3	4.24	386	Cloudy
14:45	0.33	1.65	40.91	7.2	0.278	14.3	-107.6	3.16	501	Cloudy
14:51	0.5	3	55.69	7.24	0.289	14.4	-124.4	2.52	NR	Cloudy

Legend: gal/min= gallons per minute **SU**= Standard Units **mS/cm** = millisiemens per centimeter **mL/min**= milliliters per minute **mL**= milliliters **mV**= millivolts **mg/L**= micrograms per liter **NR** = not recorded **NTU**= Nephelometric Turbidity Unit **btoc=** below top of casing **Ft**=feet **°C**=Degrees Centigrade **mg/L** =milligrams per Liter **OD** = outer diameter **ID** = Inner Diameter **In**= inches

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WELL DEVELOPMENT LOG

WELL ID: NBKK-CF1-MW02

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington			Well Depth:	65	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm), **H2S:** 0 (ppm), **LEL:** 0 %, **CO:** 0 (ppm), **O2:** 20.9 %	Start Water Level:	33.27	Ft btoc
Event Date:	November 9, 2022 5:23 PM			Water Column:	29.23	Ft
Development Team:	John Toulme			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Stability			Well Volume:	4.77	Gal
Equipment	Submersible Pump, YSI, Turbidity Meter, MultiRAE,			Start Time:	15:16	
				End Time:	16:42	
				Total Volume Purged:	33	Gal
Tubing Materials:	Poly Tubing 5/8			Screened Interval:	55 - 65	Ft bgs
				Pumping/Tube Intake:	60	Ft bgs

WELL STABILIZATION DATA

Time	Pumping rate (gal/min)	Volume Removed (gal)	Water level (ft)	pH (SU)	SP. COND. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Clarity/Color
15:21	1	0	NR	7.48	0.327	14.8	NR	2.25	999	Brown
15:26	1	5	NR	7.45	0.332	14.9	NR	3.52	999	Brown
15:31	1	5	57.1	7.48	0.34	16.8	NR	3.2	999	Brown
15:36	0.5	NR	NR	7.46	0.334	15.2	NR	3.23	999	Brown
15:41	NR	NR	NR	NR	NR	NR	NR	NR	999	Brown
15:59	1	18	60.55	7.51	0.344	15.6	NR	3.51	999	Brown
16:04	NR	NR	NR	7.52	0.348	16	NR	4.59	999	Brown

16:09	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
16:12	NR	NR	NR	7.51	0.352	15.7	NR	6.15	999	Cloudy
16:17	0.25	1.25	NR	7.51	0.352	15.7	NR	6.22	812	Cloudy
16:22	0.25	1.25	NR	7.49	0.353	15.9	NR	6.2	630	Cloudy
16:27	0.25	NR	NR	7.48	0.353	16.1	NR	6.05	352	Clear
16:32	0.25	1.25	NR	7.48	0.353	16	NR	6	313	Cloudy
16:37	0.25	NR	NR	7.47	0.353	16	NR	5.92	283	Cloudy
16:42	0.25	1.25	NR	7.47	0.353	16	NR	5.94	266	Cloudy

Legend: gal/min= gallons per minute **SU**= Standard Units **mS/cm** = millisiemens per centimeter **mL/min**= milliliters per minute **mL**= milliliters **mV**= millivolts **mg/L**= micrograms per liter **NR** = not recorded **NTU**= Nephelometric Turbidity Unit **btoc=** below top of casing **Ft**=feet **°C**=Degrees Centigrade **mg/L** =milligrams per Liter **OD** = outer diameter **ID** = Inner Diameter **In**= inches

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WELL DEVELOPMENT LOG

WELL ID: NBKK-CF1-MW02

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington			Well Depth:	65	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm), **H2S:** 0 (ppm), **LEL:** 0 %, **CO:** 0 (ppm), **O2:** 20.9 %	Start Water Level:	35.09	Ft btoc
Event Date:	November 10, 2022 11:40 AM			Water Column:	27.41	Ft
Development Team:	John Toulme			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Stability			Well Volume:	4.47	Gal
Equipment	Submersible Pump, YSI, Turbidity Meter, MultiRAE,			Start Time:	09:05	
				End Time:	09:50	
				Total Volume Purged:	8.75	Gal
Tubing Materials:	Poly Tubing 5/8”			Screened Interval:	55 - 65	Ft bgs
				Pumping/Tube Intake:	60.5	Ft bgs

WELL STABILIZATION DATA

Time	Pumping rate (gal/min)	Volume Removed (gal)	Water level (ft)	pH (SU)	SP. COND. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Clarity/Color
09:08	0.25	0	42	7.42	0.332	14.2	NR	3.21	810	Cloudy
09:13	0.25	1.25	46.05	7.41	0.333	14.2	NR	3.23	370	Cloudy
09:18	0.25	1.25	47.5	7.43	0.335	14.3	NR	3.23	206	Cloudy
09:23	0.25	1.25	48.28	7.42	0.341	14.2	NR	3.25	149	Cloudy
09:28	0.25	1.25	48.28	7.44	0.333	14.3	NR	3.24	100	Cloudy
09:33	0.25	1.25	48.25	7.44	0.339	14.3	NR	3.23	69.9	Clear
09:38	0.25	1.25	48.05	7.43	0.341	14.3	NR	3.23	48	Clear

09:43	0.25	1.25	47.95	7.43	0.341	14.4	NR	3.24	44.7	Clear
09:48	0.25	0	47.95	7.44	0.341	14.3	NR	3.23	39.6	Clear

Legend: gal/min= gallons per minute **SU**= Standard Units **mS/cm** = millisiemens per centimeter **mL/min**= milliliters per minute **mL**= milliliters **mV**= millivolts **mg/L**= micrograms per liter **NR** = not recorded **NTU**= Nephelometric Turbidity Unit **btoc=** below top of casing **Ft**=feet **°C**=Degrees Centigrade **mg/L** =milligrams per Liter **OD** = outer diameter **ID** = Inner Diameter **In**= inches

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WELL DEVELOPMENT LOG

WELL ID: NBKK-CF1-MW03

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington			Well Depth:	63.5	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm), **H2S:** 0 (ppm), **LEL:** 0 %, **CO:** 0 (ppm), **O2:** 20.9 %	Start Water Level:	23.28	Ft btoc
Event Date:	November 8, 2022 6:46 PM			Water Column:	30.22	Ft
Development Team:	Tommy Ta, Tim Anderson, John Toulme			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Stability			Well Volume:	6.55	Gal
Equipment:	Submersible Pump, YSI, Turbidity Meter, MultiRAE,			Start Time:	16:04	
				End Time:	12:00	
				Total Volume Purged:	65	Gal
Tubing Materials:	5/8" Poly Tubing			Screened Interval:	53.5 - 63.5	Ft bgs
				Pumping/Tube Intake:	58	Ft bgs

WELL STABILIZATION DATA

Time	Pumping rate (gal/min)	Volume Removed (gal)	Water level (ft)	pH (SU)	SP. COND. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Clarity/Color
16:09	1	0	23.28	8.04	0.292	14	-1,805.5	3.46	NR	Cloudy
16:14	NR	NR	NR	7.75	0.295	13.9	NR	1.56	999	Cloudy
16:19	NR	NR	NR	7.87	0.296	13.9	NR	0.88	889	Cloudy
16:24	NR	NR	NR	7.81	0.296	13.9	NR	1.63	775	Cloudy
16:29	NR	NR	NR	7.73	0.296	13.7	NR	0.61	941	Cloudy
09:49	1	1,755	29.25	7.35	0.286	14.1	NR	3.17	557	Cloudy
09:54	NR	NR	29.25	7.37	0.282	13.8	NR	1.66	563	Cloudy

09:59	1	5	30.74	7.36	0.282	14.3	NR	0.7	514	Cloudy
10:04	1	5	35.28	7.35	0.284	14.2	NR	0.6	412	Cloudy
10:09	0.25	1.25	35.2	7.36	0.281	14.3	NR	0.56	999	Cloudy
10:14	0.25	1.25	35.2	7.31	0.281	14.3	NR	0.57	985	Cloudy
10:19	0.25	1.25	34.25	7.31	0.28	14.2	NR	0.89	910	Cloudy
10:24	0.25	1.25	34.18	7.32	0.279	14.2	NR	1.05	681	Cloudy
10:29	0.25	1.25	34.01	7.31	0.279	14.2	NR	1.24	294	Cloudy
10:34	0.25	5	34.31	7.31	0.28	14.3	NR	1.7	243	Cloudy
10:39	0.25	5	34.4	7.3	0.281	14.2	NR	0.81	233	Cloudy
10:44	0.25	5	34.81	7.29	0.284	14.2	NR	0.78	175	Cloudy
10:49	0.25	5	34.83	7.28	0.284	14.1	NR	0.79	129	Cloudy
10:54	0.25	1.25	35.04	7.3	0.284	14.2	NR	0.72	83.5	Clear
10:59	0.25	1.25	35.02	7.29	0.285	14.2	NR	0.74	73.5	Clear
11:04	0.25	1.25	35.01	7.28	0.285	14.3	NR	0.76	67.4	Clear

11:09	0.25	1.25	34.92	7.27	0.285	14.2	NR	0.8	66	Clear
11:14	1	5	35.08	7.28	0.285	14.2	NR	0.82	57.6	Clear
11:19	0.25	5	35.02	7.27	0.285	14.2	NR	0.82	54.9	Clear
11:24	0.25	5	35.08	7.28	0.285	14.3	NR	0.81	56.6	Clear
11:29	0.25	1.25	35.1	7.26	0.285	14.3	NR	0.82	55.5	Clear
11:34	0.25	5	35.14	7.29	0.285	14.4	NR	0.84	49.8	Clear
11:39	0.25	5	35	7.27	0.285	14.3	NR	0.88	48.6	Clear
11:44	0.25	5	35	7.27	0.286	14.3	NR	0.87	48.6	Clear
11:49	0.25	1.25	35.01	7.27	0.286	1	NR	0.86	35.4	Clear
11:54	0.25	1.25	35.01	7.25	0.286	14.3	NR	0.87	33.3	Clear
11:59	0.25	1.257	35.07	7.26	0.285	14.3	NR	0.88	30	No color change. Note for total volume purged, deduce 65 gal

Legend: gal/min= gallons per minute **SU**= Standard Units **mS/cm** = millisiemens per centimeter **mL/min**= milliliters per minute **mL**= milliliters **mV**= millivolts **mg/L**= micrograms per liter **NR** = not recorded **NTU**= Nephelometric Turbidity Unit **btoc=** below top of casing **Ft**=feet **°C**=Degrees Centigrade **mg/L** =milligrams per Liter **OD** = outer diameter **ID** = Inner Diameter **In**= inches

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WELL DEVELOPMENT LOG

WELL ID: NBKK-OU2A5-MW01

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington			Well Depth:	60	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	NR	Start Water Level:	16.44	Ft btoc
Event Date:	November 16, 2022 11:19 AM			Water Column:	43.56	Ft
Development Team:	Nathan Leu, Tim Anderson			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Stability			Well Volume:	7.11	Gal
Equipment	Submersible Pump, YSI, Turbidity Meter, MultiRAE,			Start Time:	08:19 (11/15/22)	
				End Time:	11:01 (11/17/22)	
				Total Volume Purged:	60	Gal
Tubing Materials:	5/8" Poly Tubing			Screened Interval:	40-60	Ft bgs
				Pumping/Tube Intake:	57	Ft bgs

WELL STABILIZATION DATA

Time	Pumping rate (gal/min)	Volume Removed (gal)	Water level (ft)	pH (SU)	SP. COND. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Clarity/Color
08:19	1	0	16.44	7.89	0.5	12.8	-541.5	4.94	999	Brown
09:27	1	68	45.13	7.91	0.544	12.2	-154.2	0.44	999	Brown
09:37	0.33	3.3	50.6	7.88	0.535	12.4	-50.6	0.94	999	Brown
09:45	0.33	2.64	53.88	7.78	0.548	13.5	-123.3	2.66	999	Brown
11:15	0.5	45	40	7.65	0.576	12.2	-176.1	6.45	999	Brown
11:33	0.33	5.94	45.31	7.58	0.6	12.3	-78.4	4.22	999	Brown
11:42	0.33	2.97	55.29	7.66	0.601	12.4	-41.1	5.67	999	Brown

11:47	0.33	1.65	55.29	7.67	0.588	12.7	-97.8	3.35	999	Brown
13:15	0.33	29.04	42.18	7.4	0.61	12.9	-116.2	2.55	999	Brown
13:23	0.5	4	NR	7.49	0.61	13	-71.1	6.46	999	Brown
14:20	0.5	28.5	44.83	7.45	0.604	12.8	-62.2	4.66	999	Brown
16:32	0.5	66	28	6.68	0.507	12.1	-15.1	15	999	Brown
16:35	0.5	1.5	59	7.34	0.618	12.2	-59.1	5.59	999	Brown
08:10	0.5	467	17.01	7.41	0.609	11.9	-113.9	9.41	785	Cloudy
08:23	0.5	6.5	36.34	7.41	0.612	12.1	-154	6.21	301	Cloudy
08:32	0.3	2.7	45.8	7.36	0.61	11.7	-107.1	6.29	301	Cloudy
09:43	0.5	35.5	29.88	7.34	0.61	12.8	-117.8	2.42	999	Cloudy
10:41	0.1	5.8	57	7.34	0.611	13.3	-98.8	3.73	523	Cloudy
10:48	0.1	0.7	59	7.3	0.619	13.5	-96.1	4.28	422	Cloudy
10:50	0.1	0.2	59	7.32	0.62	13.5	-99.7	3.85	148	Clear
10:54	0.1	0.4	59	7.33	0.623	13.5	-101.9	3.35	65	Clear

10:58	0.1	0.4	59	7.33	0.624	13.7	-106.9	3.28	46	Clear

Legend: gal/min= gallons per minute **SU**= Standard Units **mS/cm** = millisiemens per centimeter **mL/min**= milliliters per minute **mL**= milliliters **mV**= millivolts **mg/L**= micrograms per liter **NR** = not recorded **NTU**= Nephelometric Turbidity Unit **btoc=** below top of casing **Ft**=feet **°C**=Degrees Centigrade **mg/L** =milligrams per Liter **OD** = outer diameter **ID** = Inner Diameter **In**= inches

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WELL DEVELOPMENT LOG

WELL ID: NBKK-OU2A5-MW02

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington			Well Depth:	60	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	NR	Start Water Level:	16.3	Ft btoc
Event Date:	November 11, 2022 11:29 AM			Water Column:	43.7	Ft
Development Team:	John Toulme			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Stability			Well Volume:	7.13	Gal
Equipment	Submersible Pump, YSI, MultiRAE,			Start Time:	08:45	
				End Time:	13:55	
				Total Volume Purged:	148	Gal
Tubing Materials:	5/8" Poly Tubing			Screened Interval:	40 - 60	Ft bgs
				Pumping/Tube Intake:	58	Ft bgs

WELL STABILIZATION DATA

Time	Pumping rate (gal/min)	Volume Removed (gal)	Water level (ft)	pH (SU)	SP. COND. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Clarity/Color
08:50	1	0	39.7	7.65	0.372	13.1	-783.6	3.09	999	Brown
08:55	1	5	41.85	7.66	0.373	13.1	-770	2.14	999	Brown
09:00	1	5	42.78	7.66	0.372	12.9	-659	1.2	999	Brown
09:05	1	5	43.73	7.63	0.363	12.6	-574.2	0.87	999	Brown
09:10	1	5	44.05	7.62	0.357	12.4	-544.2	0.74	999	Brown
09:15	1	5	45.55	7.62	0.352	12.8	-527.5	0.67	999	Brown
09:20	1	5	45.8	7.61	0.35	12.6	-396.4	1.28	999	Brown

09:25	1	5	47.75	7.58	0.346	13	-403.2	0.94	999	Brown
09:30	1	5	48.4	7.62	0.353	12.8	-255.5	1.62	999	Brown
09:35	0	0	48	NR	NR	NR	NR	NR	NR	Brown
09:40	0	0	48	NR	NR	NR	NR	NR	NR	Brown
09:45	0.5	2.513	48.7	7.66	0.347	13.3	-104.9	2.78	999	Brown
09:50	0.5	2.5	52	7.65	0.349	12.7	-110.1	3.29	999	Brown
09:55	0.5	2.5	49.7	7.71	0.347	12.8	-108.6	3.3	999	Brown
10:00	0.5	2.5	49	7.68	0.342	13.4	-81.9	4.68	999	Brown
10:20	0	0	37.5	NR	NR	NR	NR	NR	NR	Brown
10:25	1	5	44.5	7.55	0.338	13.2	-127.4	30.1	999	Brown
10:30	1	5	49.4	7.58	0.347	12.8	-152.3	3.84	999	Brown
10:35	1	5	52	7.61	0.343	12.9	-122.5	3.92	999	Brown
10:40	0	0	41.8	NR	NR	NR	NR	NR	NR	Brown
10:45	0	0	39.5	NR	NR	NR	NR	NR	NR	Brown

10:50	0	0	36.1	NR	NR	NR	NR	NR	NR	Brown
10:55	0	0	33.5	NR	NR	NR	NR	NR	NR	Brown
11:00	1	5	43.05	7.59	0.337	13.1	-185.2	1.88	999	Cloudy
11:05	0.5	2.5	43.9	7.58	0.344	13.1	-105.4	3.79	999	Cloudy
11:10	1	5	48.2	7.6	0.347	13.5	-96.1	3.77	999	Cloudy
11:15	0	0	42.2	NR	NR	NR	NR	NR	NR	Cloudy
11:20	0	0	40	NR	NR	NR	NR	NR	NR	Cloudy
11:25	1	5	52	7.53	0.347	13.3	-72.5	4.28	999	Brown
11:30	0	0	44	NR	NR	NR	NR	NR	NR	Brown
11:35	1	5	52.5	7.56	0.341	13.4	-114.3	3.1	999	Brown
11:40	0	0	43.55	NR	NR	NR	NR	NR	NR	Brown
11:45	NR	NR	41.6	NR	NR	NR	NR	NR	NR	Cloudy
11:50	1	5	52	7.54	0.342	13.4	-95.2	3.24	999	Brown
11:55	0	0	43	NR	NR	NR	NR	NR	NR	Brown

12:00	0	0	41.5	NR	NR	NR	NR	NR	NR	Brown
12:20	1	15	48.45	7.54	0.323	18.8	-91.2	68.81	408	Cloudy
12:25	1	5	49.3	7.56	0.323	15	-95.2	4.75	550	Cloudy
12:30	1	5	52	7.56	0.323	17.1	-92.1	4.28	999	Cloudy
12:50	1	10	46.8	7.52	0.34	13.3	-92.3	3.7	166	Cloudy
12:55	0	0	44.5	NR	NR	NR	NR	NR	NR	Cloudy
13:00	0	NR	42.4	NR	NR	NR	NR	NR	NR	Cloudy
13:05	1	5	NR	7.54	0.341	13.1	-85.6	4.14	263	Cloudy
13:10	0.5	2.5	52	7.63	0.341	13.2	-56.1	4.47	725	Cloudy
13:15	0	0	44.5	NR	NR	NR	NR	NR	NR	Cloudy
13:20	0	0	42.5	NR	NR	NR	NR	NR	NR	Cloudy
13:25	1	NR	NR	7.53	0.336	13.1	-128.3	2.68	151	Cloudy
13:30	0.5	2.5	48.5	7.54	0.337	13.2	-104.5	3.27	150	Cloudy
13:35	0.5	2.5	50	7.53	0.34	13.3	-58.6	4.83	335	Cloudy

13:40	0.5	2.5	50.5	7.54	0.342	13.1	-59.7	4.63	414	Cloudy
13:45	0	0	44.5	NR	NR	NR	NR	NR	NR	Cloudy
13:50	0	0	42.2	NR	NR	NR	NR	NR	NR	Cloudy
13:55	1	5	52	7.55	0.334	13	-94.2	1.81	116	Cloudy

Legend: gal/min= gallons per minute **SU**= Standard Units **mS/cm** = millisiemens per centimeter **mL/min**= milliliters per minute **mL**= milliliters **mV**= millivolts **mg/L**= micrograms per liter **NR** = not recorded **NTU**= Nephelometric Turbidity Unit **btoc=** below top of casing **Ft**=feet **°C**=Degrees Centigrade **mg/L** =milligrams per Liter **OD** = outer diameter **ID** = Inner Diameter **In**= inches

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WELL DEVELOPMENT LOG

WELL ID: NBKK-OU2A5-MW03

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington			Well Depth:	40	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	NR	Start Water Level:	25.6	Ft btoc
Event Date:	November 10, 2022 1:51 PM			Water Column:	14.4	Ft
Development Team:	John Toulme			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Stability			Well Volume:	2.35	Gal
Equipment	Submersible Pump, Bailer, YSI, MultiRAE,			Start Time:	12:20	
				End Time:	16:40	
				Total Volume Purged:	53	Gal
Tubing Materials:	5/8" Poly Tubing			Screened Interval:	20 - 40	Ft bgs
				Pumping/Tube Intake:	38	Ft bgs

WELL STABILIZATION DATA

Time	Pumping rate (gal/min)	Volume Removed (gal)	Water level (ft)	pH (SU)	SP. COND. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Clarity/Color
12:25	0.5	0	38.5	7	0.541	13.2	-158.6	2.94	999	Brown
12:30	0.25	1.25	38.5	7.03	0.545	12.8	-170	2.16	999	Brown
12:35	0.25	1.25	38.5	7.04	0.547	12.6	-161.1	2.28	999	Brown
12:40	0.25	1.25	38.5	7.08	0.545	12.2	-117.7	3.77	999	Brown
12:45	0.25	1.25	37	7.13	0.553	13.3	-77	6.57	999	Brown
12:50	0.25	1.25	38.5	7.11	0.556	13.4	-63.6	6.97	999	Brown
12:55	0.25	1.25	38.5	7.09	0.557	12.9	-71.9	7.29	999	Brown

13:00	0.25	1.25	38.5	7.07	0.661	12.6	-91.6	6.83	999	Brown
13:05	0	0	38.5	7.07	0.661	12.6	-91.6	6.83	999	Brown
13:10	0	0	36.2	NR	NR	NR	NR	NR	NR	Brown
13:15	0.26	1.3	36.5	7.08	0.558	12	-107.4	7.2	999	Brown
13:20	0.25	1.25	39	7.02	0.558	13.7	-88.9	6.96	999	Brown
13:25	0	0	36.5	7.02	0.562	13.6	-92.9	6.81	999	Brown
13:30	0.25	1.25	39	7.02	0.563	13.4	-63.8	6.76	999	Brown
13:35	0.25	1.25	39	7.01	0.564	13.4	-52.9	7.21	999	Brown
13:40	0.25	1.25	39	7	0.564	13.2	-49.2	7.4	999	Brown
13:45	0.25	1.25	39	6.98	0.563	12.7	-45	7.59	999	Brown
13:50	0.25	1.25	39	6.98	0.564	12.5	-49	13.94	999	Brown
13:55	0.25	1.25	39	6.98	0.564	12.5	-49	13.94	999	Brown
14:00	0.25		39	7	0.565	13	-103.8	7.79	999	Brown
14:05	0.25	1.25	39	6.98	0.565	12.6	-123.3	7.91	999	Brown

14:10	0.25	1.25	39	6.95	0.562	12.9	-143.2	7.82	999	Cloudy
14:15	0.25	1.25	39	6.96	0.564	12.8	-139.2	7.85	999	Cloudy
14:20	0.25	1.25	39	6.94	0.564	12.6	-130.8	7.99	999	Cloudy
14:25	0.25	1.25	39	6.93	0.563	12.5	-119.2	7.56	999	Cloudy
14:30	0.25	1.25	39	6.93	0.563	12.5	-119.4	7.76	999	Cloudy
14:35	0.25	1.25	39	6.93	0.563	12.7	-117.3	7.51	999	Cloudy
14:40	0.25	1.25	39	6.89	0.565	12.6	-111.1	7.59	999	Cloudy
14:45	0.25	1.25	39	6.89	0.565	12.7	-115.3	7.23	999	Cloudy
14:50	0.25	1.25	39	6.89	0.562	13	-114.9	7.99	999	Cloudy
14:55	0.25	1.25	39	6.87	0.563	12.9	-119.6	7.75	999	Cloudy
15:00	0.25	NR	39	6.88	0.56	12.8	-117.9	8.51	999	Cloudy
15:10	0.25	2.5	39	6.84	0.561	12.9	-116.6	7.75	999	Cloudy
15:15	0.25	1.25	39	6.87	0.561	12.8	-115.6	7.97	999	Cloudy
15:20	0.25	1.25	39	6.84	0.56	13.6	-116.2	7.97	999	Cloudy

15:25	0.25	1.25	39	6.85	0.561	13.6	-116.1	8.53	999	Cloudy
15:30	0.25	1.25	39	6.8	0.558	12.3	-102.8	8.09	999	Cloudy
15:35	0.25	1.25	39	6.86	0.561	12.8	-108.2	8.23	999	Cloudy
15:40	0.25	1.25	39	6.81	0.558	12.5	-103.2	8.03	549	Cloudy
15:45	0.25	1.25	39	6.81	0.558	12.5	-103.2	8.03	384	Cloudy
15:50	0.25	1.25	39	6.81	0.568	12.6	-90.5	7.95	442	Cloudy
15:55	0.25	1.25	39	6.81	0.568	12.5	-95.5	8.02	405	Cloudy
16:00	0.25	1.25	39	6.8	0.559	12.6	-66.3	7.63	400	Cloudy
16:05	0.25	1.25	39	6.81	0.556	12.1	-68	8.66	510	Cloudy
16:10	0.25	1.25	39	6.82	0.556	13.1	-77	8.22	727	Cloudy
16:15	0.25	1.25	39	6.78	0.557	13	-81.6	7.87	999	Cloudy
16:30	0	0	35.85	NR	NR	NR	NR	NR	NR	Cloudy
16:35	0.25	1.25	39	6.78	0.555	13.9	-122.2	6.72	999	Cloudy
16:40	0.25	NR	39	6.73	0.552	12.7	-102.4	7.03	999	Cloudy

Legend: gal/min= gallons per minute **SU**= Standard Units **mS/cm** = millisiemens per centimeter **mL/min**= milliliters per minute **mL**= milliliters **mV**= millivolts **mg/L**= micrograms per liter **NR** = not recorded **NTU**= Nephelometric Turbidity Unit **btoc=** below top of casing **Ft**=feet **°C**=Degrees Centigrade **mg/L** =milligrams per Liter **OD** = outer diameter **ID** = Inner Diameter **In**= inches

JACOBS

WELL DEVELOPMENT LOG

WELL ID: NBKK-B1006-MW01

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington			Well Depth:	14	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm), **H2S:** 0 (ppm), **LEL:** 0 %, **CO:** 0 (ppm), **O2:** 20.9 %	Start Water Level:	2	Ft btoc
Event Date:	October 31, 2022 12:15 PM			Water Column:	12	Ft
Development Team:	Charles Royko			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Stability			Well Volume:	1.96	Gal
Equipment:	Submersible Pump, YSI, Turbidity Meter, MultiRAE,			Start Time:	12:46	
				End Time:	14:04	
				Total Volume Purged:	75	Gal
Tubing Materials:	5/8" Poly Tubing			Screened Interval:	4-14	Ft bgs
				Pumping/Tube Intake:	13	Ft bgs

WELL STABILIZATION DATA

Time	Pumping rate (gal/min)	Volume Removed (gal)	Water level (ft)	pH (SU)	SP. COND. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Clarity/Color
12:45	1	0	2	7.42	0.351	17.5	-101.3	3.1	NR	Cloudy
12:52	1	7	NR	7.39	0.33	17.4	-184.6	2.47	NR	Cloudy
13:10	1	18	NR	6.87	0.26	17.4	-175.8	1.89	NR	Cloudy
13:19	1	9	NR	6.83	0.257	17.5	-159.7	1.87	NR	Cloudy
13:24	1	5	NR	6.78	0.254	17.5	-154.7	1.69	NR	Cloudy
13:34	1	10	NR	6.8	0.252	17.6	-153.2	1.47	NR	Cloudy
13:43	1	9	NR	6.75	0.251	17.6	-146	1.41	NR	Clear

13:50	1	7	NR	6.68	0.248	17.5	-135.1	1.49	46.5	Clear
13:55	1	5	NR	6.69	0.248	17.5	-134.9	1.41	42	Clear
14:00	1	5	NR	6.72	0.247	17.5	-137.7	1.29	37.5	Clear

Legend: gal/min= gallons per minute **SU**= Standard Units **mS/cm** = millisiemens per centimeter **mL/min**= milliliters per minute **mL**= milliliters **mV**= millivolts **mg/L**= micrograms per liter **NR** = not recorded **NTU**= Nephelometric Turbidity Unit **btoc=** below top of casing **Ft**=feet **°C**=Degrees Centigrade **mg/L** =milligrams per Liter **OD** = outer diameter **ID** = Inner Diameter **In**= inches

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WELL DEVELOPMENT LOG

WELL ID: NBKK-B1006-MW02

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington			Well Depth:	14	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm), **H2S:** 0 (ppm), **LEL:** 0 %, **CO:** 0 (ppm), **O2:** 20.9 %	Start Water Level:	1	Ft btoc
Event Date:	November 1, 2022 11:00 AM			Water Column:	13	Ft
Development Team:	Charlie Royko			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Stability			Well Volume:	2.12	Gal
Equipment:	Submersible Pump YSI, C-10285 MultiRAE			Start Time:	09:09	
				End Time:	10:55	
				Total Volume Purged:	15.3	Gal
Tubing Materials:	5/8" Poly Tubing			Screened Interval:	4 - 14	Ft bgs
				Pumping/Tube Intake:	12.75	Ft bgs

WELL STABILIZATION DATA

Time	Pumping rate (gal/min)	Volume Removed (gal)	Water level (ft)	pH (SU)	SP. COND. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Clarity/Color
09:16	0.5	0	9.5	7.13	0.309	15.8	152.9	5.91	1,000	Cloudy
09:25	0.5	4.5	9.4	7.22	0.308	15.7	102.6	5.56	1,000	Cloudy
09:42	0.5	8.5	NR	7.02	0.275	16	51.9	6.6	1,000	Cloudy
09:47	0.45	2.25	NR	7.05	0.277	15.6	31	6.1	1,000	Cloudy
10:57	0.25	0	2	6.8	0.273	15.5	41.4	5.69	718	Clear
11:03	0.25	1.5	NR	6.66	0.243	15.8	46.6	6.13	516	Cloudy
11:08	0.25	1.25	NR	6.76	0.255	16	64	6.92	790	Cloudy
11:36	0	0	NR	6.81	0.295	13.8	74.6	5.38	400	Clear

11:39	0.25	0.75	5.33	6.73	0.262	15.9	30.1	5.94	140	Clear
11:42	0.25	0.75	6.03	6.63	0.251	15.7	34.7	6.19	122	Clear
11:45	0.25	0.75	6.61	5.55	0.246	15.5	43.2	6.78	122	Clear
11:48	0.25	0.75	6.75	6.56	0.241	15.5	45	6.41	123	Clear
11:51	0.25	0.75	6.75	6.62	0.238	15.6	43.6	5.85	189	Cloudy
11:56	0.25	1.25	6.7	6.6	0.238	15.7	48.5	6.19	116	Clear
11:58	0.25	0.5	6.79	6.6	0.238	15.8	48	6.2	66.7	Clear
12:01	0.25	0.75	6.9	6.62	0.238	15.7	47	6.32	46.1	Clear
12:03	0.25	0.5	6.9	6.64	0.238	15.6	46.1	6.27	25.9	Clear
12:06	0.25	0.75	6.9	6.63	0.238	15.6	45.2	6.43	32.3	Clear

Legend: gal/min= gallons per minute **SU**= Standard Units **mS/cm** = millisiemens per centimeter **mL/min**= milliliters per minute **mL**= milliliters **mV**= millivolts **mg/L**= micrograms per liter **NR** = not recorded **NTU**= Nephelometric Turbidity Unit **btoc=** below top of casing **Ft**=feet **°C**=Degrees Centigrade **mg/L** =milligrams per Liter **OD** = outer diameter **ID** = Inner Diameter **In**= inches

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WELL DEVELOPMENT LOG

WELL ID: NBKK-B1006-MW03

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington			Well Depth:	16	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm), **H2S:** 0 (ppm), **LEL:** 0 %, **CO:** 0 (ppm), **O2:** 20.9 %	Start Water Level:	7.01	Ft btoc
Event Date:	November 1, 2022 5:22 PM			Water Column:	8.99	Ft
Development Team:	Charlie Royko			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Stability			Well Volume:	14.86	Gal
Equipment:	Submersible Pump, YSI, Turbidity Meter, MultiRAE			Start Time:	15:22	
				End Time:	15:45	
				Total Volume Purged:	30	Gal
Tubing Materials:	5/8" Poly Tubing			Screened Interval:	6-16	Ft bgs
				Pumping/Tube Intake:	11	Ft bgs

WELL STABILIZATION DATA

Time	Pumping rate (gal/min)	Volume Removed (gal)	Water level (ft)	pH (SU)	SP. COND. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Clarity/Color
15:23	1.5	0	7.01	6.12	0.154	17.5	195.3	6.45	14.8	Clear
15:27	1.5	6	7.03	6.12	0.154	17.5	196.5	3.2	12.9	Clear
15:31	1.5	6	7.06	6.12	0.154	17.5	198.2	2.84	7.13	Clear
15:36	1.5	7.5	7.1	6.11	0.154	17.5	199.9	2.54	6.71	Clear
15:39	1.5	4.5	7.13	6.11	0.154	17.5	200	2.46	6.7	Clear
15:43	1.5	6	7.09	6.11	0.154	17.5	200.8	2.4	4.44	Clear

Legend: gal/min= gallons per minute **SU=** Standard Units **mS/cm** = millisiemens per centimeter **mL/min=** milliliters per minute **mL=** milliliters **mV=** millivolts **mg/L=** micrograms per liter **NTU=** Nephelometric Turbidity Unit **btoc=** below top of casing **Ft**=feet **°C**=Degrees Centigrade **mg/L** =milligrams per Liter **OD** = outer diameter **ID** = Inner Diameter **In=** inches

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WELL DEVELOPMENT LOG

WELL ID: NBKK-B1006-MW04

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington			Well Depth:	15	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm), **H2S:** 0 (ppm), **LEL:** 0 %, **CO:** 0 (ppm), **O2:** 20.9 %	Start Water Level:	3	Ft btoc
Event Date:	November 16, 2022 6:04 PM			Water Column:	12	Ft
Development Team:	Nathan Leu, Tim Anderson			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Stability			Well Volume:	1.96	Gal
Equipment	Submersible Pump, YSI, Turbidity Meter, MultiRAE			Start Time:	15:04	
				End Time:	15:58	
				Total Volume Purged:	42.0	Gal
Tubing Materials:	5/8" Poly Tubing			Screened Interval:	5 - 15	Ft bgs
				Pumping/Tube Intake:	14	Ft bgs

WELL STABILIZATION DATA

Time	Pumping rate (gal/min)	Volume Removed (gal)	Water level (ft)	pH (SU)	SP. COND. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Clarity/Color
15:04	1	0	4.4	5.31	0.153	15.5	6.6	2.08	999	Brown
15:16	1	12	5.34	5.25	0.151	15.4	-18.5	1.43	865	Cloudy
15:23	1	7	5.35	5.19	0.155	15.2	26.2	0.87	999	Cloudy
15:27	1	4	5.44	5.22	0.159	15.2	-18.3	1.26	476	Cloudy
15:31	0.5	NR	4.15	5.26	0.164	15.1	-47.1	0.64	754	Cloudy
15:36	0.5	2.5	4.08	5.21	0.162	15	-18.1	1.15	88.3	Clear
15:42	0.5	3	4.2	5.21	0.164	15	-18.4	1.08	54	Clear

15:49	1	4.45	NR	5.13	0.167	15.1	12.3	1.18	34.2	Clear
15:54	1	5	4.5	5.11	0.168	15.1	-3.1	1.13	28.5	Clear
15:58	1	4	4.48	5.17	0.169	15.1	-10	0.99	8.99	Clear

Legend: gal/min= gallons per minute **SU**= Standard Units **mS/cm** = millisiemens per centimeter **mL/min**= milliliters per minute **mL**= milliliters **mV**= millivolts **mg/L**= micrograms per liter **NR** = not recorded **NTU**= Nephelometric Turbidity Unit **btoc=** below top of casing **Ft**=feet **°C**=Degrees Centigrade **mg/L** =milligrams per Liter **OD** = outer diameter **ID** = Inner Diameter **In**= inches

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WELL DEVELOPMENT LOG

WELL ID: NBKK-OU2A2-MW01

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington			Well Depth:	14	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm), **H2S:** 0 (ppm), **LEL:** 0 %, **CO:** 0 (ppm), **O2:** 20.9 %	Start Water Level:	4.5	Ft btoc
Event Date:	March 29, 2023 9:45 AM			Water Column:	9.5	Ft
Development Team:	Eric Storkerson			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Stability			Well Volume:	1.55	Gal
Equipment	Submersible Pump, YSI, Turbidity Meter, MultiRAE			Start Time:	09:50	
				End Time:	13:18	
				Total Volume Purged:	156	Gal
Tubing Materials:	5/8" Poly Tubing			Screened Interval:	4 - 14	Ft bgs
				Pumping/Tube Intake:	9	Ft bgs

WELL STABILIZATION DATA

Time	Pumping rate (gal/min)	Volume Removed (gal)	Water level (ft)	pH (SU)	SP. COND. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Clarity/Color
11:03	2	NR	4.50	NR	NR	NR	NR	NR	NR	NR
11:10	2	14	6.02	7.20	0.314	10.67	-62	4.78	102	Cloudy
11:17	2	28	6.37	7.05	0.310	10.34	-45	2.90	56.4	Cloudy
11:24	2	42	4.98	6.82	0.295	10.55	-41	3.65	71.7	Clearing Up
11:31	2	56	6.48	6.66	0.297	10.69	-40	4.00	41.4	Slightly Turbid
11:41	2	76	6.59	6.49	0.296	10.63	-26	3.64	25.3	Clear
11:51	2	96	6.51	6.48	0.288	10.57	-29	4.52	30.7	Clear

12:48	2	NR	4.48	NR	NR	NR	NR	NR	NR	NR
12:58	2	116	6.10	6.92	0.293	11.85	-70	4.23	27.2	Clear
13:08	2	136	6.85	6.80	0.283	11.18	-47	2.58	25.8	Clear
13:18	2	156	7.18	6.74	0.285	10.82	-45	2.69	23.5	Clear

Legend: gal/min= gallons per minute **SU**= Standard Units **mS/cm** = millisiemens per centimeter **mL/min**= milliliters per minute **mL**= milliliters **mV**= millivolts **mg/L**= micrograms per liter **NR** = not recorded **NTU**= Nephelometric Turbidity Unit **btoc=** below top of casing **Ft**=feet **°C**=Degrees Centigrade **mg/L** =milligrams per Liter **OD** = outer diameter **ID** = Inner Diameter **In**= inches

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WELL DEVELOPMENT LOG

WELL ID: NBKK-OU2A2-MW02

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington			Well Depth:	14	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm), **H2S:** 0 (ppm), **LEL:** 0 %, **CO:** 0 (ppm), **O2:** 20.9 %	Start Water Level:	6.9	Ft btoc
Event Date:	November 18, 2022 3:29 PM			Water Column:	7.1	Ft
Development Team:	Nathan Leu, Tim Anderson			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Stability			Well Volume:	1.16	Gal
Equipment	Submersible Pump, YSI, Turbidity Meter, MultiRAE			Start Time:	12:29	
				End Time:	13:25	
				Total Volume Purged:	28	Gal
Tubing Materials:	5/8" Poly Tubing			Screened Interval:	4 - 14	Ft bgs
				Pumping/Tube Intake:	9	Ft bgs

WELL STABILIZATION DATA

Time	Pumping rate (gal/min)	Volume Removed (gal)	Water level (ft)	pH (SU)	SP. COND. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Clarity/Color
12:29	1	0	6.98	5.34	0.153	10.9	24.4	1.96	999	Brown
12:42	1	NR	8.53	5.18	0.157	10.9	3.4	0.44	999	Cloudy
12:45	1	3	8.8	5.2	0.164	10.9	-19.2	0.51	690	Cloudy
12:51	1	NR	7.74	5.2	0.166	11	-35.9	0.65	123	Clear
12:53	1	NR	7.77	5.17	0.168	11	-37.2	0.8	62.8	Clear
13:06	1	13	7.78	5.2	0.17	11	-44.7	0.78	44.2	Clear
13:12	1	6	7.82	5.21	0.173	11	-38.2	1.85	30.6	Clear

13:18	1	6	7.85	5.22	0.175	10.9	-44.8	0.93	26.5	Clear

Legend: gal/min= gallons per minute **SU**= Standard Units **mS/cm** = millisiemens per centimeter **mL/min**= milliliters per minute **mL**= milliliters **mV**= millivolts **mg/L**= micrograms per liter **NR** = not recorded **NTU**= Nephelometric Turbidity Unit **btoc=** below top of casing **Ft**=feet **°C**=Degrees Centigrade **mg/L** =milligrams per Liter **OD** = outer diameter **ID** = Inner Diameter **In**= inches

JACOBS

WELL DEVELOPMENT LOG

WELL ID: NBKK-OU2A2-MW03

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington			Well Depth:	14	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm), **H2S:** 0 (ppm), **LEL:** 0 %, **CO:** 0 (ppm), **O2:** 20.9 %	Start Water Level:	3.5	Ft btoc
Event Date:	November 18, 2022 2:11 PM			Water Column:	10.5	Ft
Development Team:	Nathan Leu, Tim Anderson			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Stability			Well Volume:	1.71	Gal
Equipment	Submersible Pump, YSI, Turbidity Meter, MultiRAE			Start Time:	11:11	
				End Time:	12:00	
				Total Volume Purged:	18.2	Gal
Tubing Materials:	5/8" Poly Tubing			Screened Interval:	4 - 14	Ft bgs
				Pumping/Tube Intake:	14	Ft bgs

WELL STABILIZATION DATA

Time	Pumping rate (gal/min)	Volume Removed (gal)	Water level (ft)	pH (SU)	SP. COND. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Clarity/Color
11:11	1	0	5.2	6.05	0.396	11	3.6	1.17	999	Cloudy
11:21	0.7	7	6.7	6.21	0.351	10.7	-14.2	4.78	499	Cloudy
11:25	0.7	2.8	6.45	5.92	0.316	NR	-27.5	5.99	347	Clear
11:34	0.4	3.6	11.08	6.25	0.346	11.3	-31.2	3.98	210	Cloudy
11:41	0.4	NR	10.58	6.05	0.329	11.1	-23.3	6.46	35	NR
11:47	0.4	2.4	10.6	6.93	0.326	11	-17.2	5.75	22.3	Clear
11:53	0.4	2.4	10.46	6.01	0.326	10.9	-18.1	5.2	13.5	Clear

Legend: gal/min= gallons per minute **SU=** Standard Units **mS/cm** = millisiemens per centimeter **mL/min=** milliliters per minute **mL=** milliliters **mV=** millivolts **mg/L=** micrograms per liter **NR** = not recorded
NTU= Nephelometric Turbidity Unit **btoc=** below top of casing **Ft=**feet **°C=**Degrees Centigrade **mg/L** =milligrams per Liter **OD** = outer diameter **ID** = Inner Diameter **In=** inches

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WELL DEVELOPMENT LOG

WELL ID: NBKK-OU2A2-MW04

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington			Well Depth:	17	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	NR	Start Water Level:	6	Ft btoc
Event Date:	November 17, 2022 3:21 PM			Water Column:	11	Ft
Development Team:	Nathan Leu, Tim Anderson			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Stability			Well Volume:	1.8	Gal
Equipment	Submersible Pump, YSI, C-102852 MultiRAE			Start Time:	12:21	
				End Time:	13:20	
				Total Volume Purged:	74.2	Gal
Tubing Materials:	5/8" Poly Tubing			Screened Interval:	7 - 17	Ft bgs
				Pumping/Tube Intake:	16	Ft bgs

WELL STABILIZATION DATA

Time	Pumping rate (gal/min)	Volume Removed (gal)	Water level (ft)	pH (SU)	SP. COND. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Clarity/Color
12:21	1	0	8.08	6.02	0.373	16.6	-52	4.69	999	Cloudy
12:34	1	13	9.4	5.97	0.345	16.5	-72.6	2.49	999	Cloudy
12:37	1	3	10.15	5.98	0.347	16.5	-89.3	0.88	317	Cloudy
12:44	2	14	11.6	6.02	0.323	16.5	-55.5	1.28	999	Cloudy
12:54	2	20	11.61	5.04	0.312	16.2	-9.3	5	999	Cloudy
12:58	2	8	11.7	5.97	0.321	16.4	-28.8	3.69	221	Clear
13:03	1	5	11.23	5.91	0.329	16.4	-29.2	2.54	58.9	Clear

13:10	1	7	11.12	5.91	0.329	16.4	-40.1	2.36	27.3	Clear
13:13	0.8	2.4	10.69	5.95	0.331	16.4	-38.7	2.56	12.9	Clear
13:16	0.6	1.8	9.02	6.98	0.285	15.9	-52.4	2.69	8.77	Clear

Legend: gal/min= gallons per minute **SU**= Standard Units **mS/cm** = millisiemens per centimeter **mL/min**= milliliters per minute **mL**= milliliters **mV**= millivolts **mg/L**= micrograms per liter **NR** = not recorded **NTU**= Nephelometric Turbidity Unit **btoc=** below top of casing **Ft**=feet **°C**=Degrees Centigrade **mg/L** =milligrams per Liter **OD** = outer diameter **ID** = Inner Diameter **In**= inches

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WELL DEVELOPMENT LOG

WELL ID: NBKK-OU2A2-MW05

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington			Well Depth:	17	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	NR	Start Water Level:	6.6	Ft btoc
Event Date:	November 17, 2022 4:38 PM			Water Column:	10.4	Ft
Development Team:	Nathan Leu, Tim Anderson			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Stability			Well Volume:	1.70	Gal
Equipment	Submersible Pump, YSI, C-102852 MultiRAE			Start Time:	13:38 11/17/22	
				End Time:	11:00 11/18/22	
				Total Volume Purged:	5.10	Gal
Tubing Materials:	5/8" Poly Tubing			Screened Interval:	7 - 17	Ft bgs
				Pumping/Tube Intake:	16	Ft bgs

WELL STABILIZATION DATA

Time	Pumping rate (gal/min)	Volume Removed (gal)	Water level (ft)	pH (SU)	SP. COND. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Clarity/Color
13:38	NR	0	NR	6.21	0.369	12.5	111.7	12	999	Cloudy
10:14	0.2	NR	13.5	6.32	0.389	14.9	78.6	6.26	524	Cloudy
10:17	0.1	0.3	13.69	6.29	0.367	13.9	69	4.34	683	Cloudy

Legend: gal/min= gallons per minute **SU**= Standard Units **mS/cm** = millisiemens per centimeter **mL/min**= milliliters per minute **mL**= milliliters **mV**= millivolts **mg/L**= micrograms per liter **NR** = not recorded **NTU**= Nephelometric Turbidity Unit **btoc=** below top of casing **Ft**=feet **°C**=Degrees Centigrade **mg/L** =milligrams per Liter **OD** = outer diameter **ID** = Inner Diameter **In**= inches

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WELL DEVELOPMENT LOG

WELL ID: NBKK-OU2A2-MW06

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington			Well Depth:	14	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	NR	Start Water Level:	10.85	Ft btoc
Event Date:	November 17, 2022 5:42 PM			Water Column:	6.15	Ft
Development Team:	Nathan Leu, Tim Anderson			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Stability			Well Volume:	1	Gal
Equipment	Submersible Pump, YSI, C-102852 MultiRAE			Start Time:	14:42 11/17/22	
				End Time:	09:39 11/18/22	
				Total Volume Purged:	26.4	Gal
Tubing Materials:	5/8" Poly Tubing			Screened Interval:	4 - 14	Ft bgs
				Pumping/Tube Intake:	13	Ft bgs

WELL STABILIZATION DATA

Time	Pumping rate (gal/min)	Volume Removed (gal)	Water level (ft)	pH (SU)	SP. COND. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Clarity/Color
14:42	0.8	0	11.6	5.46	0.246	12.5	35	3.82	999	Brown
14:50	0.3	2.4	12.8	5.46	0.261	12	48.2	6.81	999	Brown
14:57	2	14	9.38	5.51	0.307	12.9	63.9	10.87	999	Brown
08:55	0.2	1.8	12.37	5.62	0.281	11.4	82.9	9.36	999	Brown
09:04	0.2	1.8	12.37	5.57	0.299	9.6	79.5	7.6	999	NR
09:10	0.2	1.2	12.37	5.56	0.317	9.7	73.2	6.87	533	Cloudy

09:16	0.2	1.2	12.37	5.57	0.352	9.7	60.4	5.79	141	Clear
09:22	0.2	1.2	12.37	5.58	0.359	9.5	50.8	5.05	65.1	Clear
09:28	0.2	1.2	12.37	5.59	4.36	9.7	45.2	4.32	35	Clear
09:33	0.2	1	12.37	5.59	0.384	9.9	42.6	4.12	28.5	Clear
09:36	0.2	0.6	12.37	5.61	0.39	9.7	39.9	3.97	24	Clear

Legend: gal/min= gallons per minute **SU**= Standard Units **mS/cm** = millisiemens per centimeter **mL/min**= milliliters per minute **mL**= milliliters **mV**= millivolts **mg/L**= micrograms per liter **NR** = not recorded **NTU**= Nephelometric Turbidity Unit **btoc=** below top of casing **Ft**=feet **°C**=Degrees Centigrade **mg/L** =milligrams per Liter **OD** = outer diameter **ID** = Inner Diameter **In**= inches

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WELL DEVELOPMENT LOG

WELL ID: NBKK-S7-MW01

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington			Well Depth:	29	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	NR	Start Water Level:	7.7	Ft btoc
Event Date:	November 11, 2022 5:51 PM			Water Column:	21.3	Ft
Development Team:	John Toulme			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Stability			Well Volume:	3.48	Gal
Equipment	Submersible Pump, YSI, MultiRAE			Start Time:	15:00	
				End Time:	15:20	
				Total Volume Purged:	30	Gal
Tubing Materials:	5/8" Poly Tubing			Screened Interval:	9 - 29	Ft bgs
				Pumping/Tube Intake:	27	Ft bgs

WELL STABILIZATION DATA

Time	Pumping rate (gal/min)	Volume Removed (gal)	Water level (ft)	pH (SU)	SP. COND. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Clarity/Color
15:05	4	0	7.6	6.57	45.13	14.9	94.5	8.84	35.6	Clear
15:10	2	10	7.6	6.59	45.57	14.8	89	6.69	15.9	Clear
15:15	2	10	7.6	6.59	45.67	14.9	87.8	6.04	9.9	Clear
15:20	2	10	7.6	6.6	45.78	14.8	87.3	5.33	6.27	Clear

Legend: gal/min= gallons per minute **SU**= Standard Units **mS/cm** = millisiemens per centimeter **mL/min**= milliliters per minute **mL**= milliliters **mV**= millivolts **mg/L**= micrograms per liter **NR** = not recorded **NTU**= Nephelometric Turbidity Unit **btoc=** below top of casing **Ft**=feet **°C**=Degrees Centigrade **mg/L** =milligrams per Liter **OD** = outer diameter **ID** = Inner Diameter **In**= inches

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WELL DEVELOPMENT LOG

WELL ID: NBKK-S7-MW02

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington			Well Depth:	29	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	NR	Start Water Level:	14	Ft btoc
Event Date:	November 19, 2022 1:15 PM			Water Column:	15	Ft
Development Team:	Nathan Leu			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Stability			Well Volume:	2.45	Gal
Equipment	Submersible Pump YSI, YSI 650 MDS			Start Time:	10:15	
				End Time:	10:50	
				Total Volume Purged:	16	Gal
Tubing Materials:	5/8" Poly Tubing			Screened Interval:	9 - 29	Ft bgs
				Pumping/Tube Intake:	28	Ft bgs

WELL STABILIZATION DATA

Time	Pumping rate (gal/min)	Volume Removed (gal)	Water level (ft)	pH (SU)	SP. COND. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Clarity/Color
10:29	1	0	12.7	7.97	44.03	12.51	94.8	5.55	156	Cloudy
10:37	1	8	12.55	8.03	43.99	12.45	91	5.72	46.3	Cloudy
10:43	1	6	12.5	8.05	44.11	12.51	86.7	5.67	11.6	Clear
10:45	1	2	12.57	8.07	44.11	12.5	80.3	5.82	7.22	Clear

Legend: gal/min= gallons per minute **SU**= Standard Units **mS/cm** = millisiemens per centimeter **mL/min**= milliliters per minute **mL**= milliliters **mV**= millivolts **mg/L**= micrograms per liter **NR** = not recorded **NTU**= Nephelometric Turbidity Unit **btoc=** below top of casing **Ft**=feet **°C**=Degrees Centigrade **mg/L** =milligrams per Liter **OD** = outer diameter **ID** = Inner Diameter **In**= inches

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WELL DEVELOPMENT LOG

WELL ID: NBKK-S7-MW04

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington			Well Depth:	19	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	NR	Start Water Level:	10.26	Ft btoc
Event Date:	November 19, 2022 2:51 PM			Water Column:	8.74	Ft
Development Team:	Nathan Leu			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Stability			Well Volume:	1.43	Gal
Equipment	Submersible Pump YSI, YSI 650 MDS			Start Time:	11:51	
				End Time:	12:25	
				Total Volume Purged:	16.2	Gal
Tubing Materials:	5/8" Poly Tubing			Screened Interval:	9 - 19	Ft bgs
				Pumping/Tube Intake:	18	Ft bgs

WELL STABILIZATION DATA

Time	Pumping rate (gal/min)	Volume Removed (gal)	Water level (ft)	pH (SU)	SP. COND. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Clarity/Color
11:59	1	0	12.8	8.44	2.728	17.23	-192.3	6.59	331	Cloudy
12:03	0.9	3.6	12.23	8.41	2.797	17.15	-202.4	4.38	58.6	Clear
12:08	0.9	4.5	12.21	8.41	2.793	17.13	-215.5	1.05	15	Clear
12:11	0.9	2.7	12.26	8.39	2.798	17.15	-220	1.57	5.16	Clear
12:17	0.9	5.4	12.82	8.38	2.772	17.2	-210.9	999	2.82	Clear

Legend: gal/min= gallons per minute **SU**= Standard Units **mS/cm** = millisiemens per centimeter **mL/min**= milliliters per minute **mL**= milliliters **mV**= millivolts **mg/L**= micrograms per liter **NR** = not recorded **NTU**= Nephelometric Turbidity Unit **btoc=** below top of casing **Ft**=feet **°C**=Degrees Centigrade **mg/L** =milligrams per Liter **OD** = outer diameter **ID** = Inner Diameter **In**= inches

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WELL DEVELOPMENT LOG

WELL ID: NBKK-S7-MW05

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington			Well Depth:	29	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	NR	Start Water Level:	9.7	Ft btoc
Event Date:	November 11, 2022 8:06 PM			Water Column:	19.3	Ft
Development Team:	John Toulme			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Stability			Well Volume:	3.15	Gal
Equipment	Submersible Pump YSI, MultiRAE			Start Time:	16:15	
				End Time:	16:40	
				Total Volume Purged:	30	Gal
Tubing Materials:	Poly Tubing 5/8			Screened Interval:	9 - 29	Ft bgs
				Pumping/Tube Intake:	27	Ft bgs

WELL STABILIZATION DATA

Time	Pumping rate (gal/min)	Volume Removed (gal)	Water level (ft)	pH (SU)	SP. COND. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Clarity/Color
16:20	3	0	9.7	6.83	46.65	14.1	53.7	27.91	45.6	Clear
16:25	2	10	9.7	6.81	46.74	14.1	49.2	9.6	24.6	Clear
16:30	2	10	9.7	6.8	46.59	14.1	50.9	8.31	17.5	Clear
16:35	2	0	9.7	6.81	46.1	14.1	56.7	7.25	11	Clear
16:40	2	10	9.7	6.81	46.79	14	58.4	7.23	7.9	Clear

Legend: gal/min= gallons per minute **SU**= Standard Units **mS/cm** = millisiemens per centimeter **mL/min**= milliliters per minute **mL**= milliliters **mV**= millivolts **mg/L**= micrograms per liter **NR** = not recorded **NTU**= Nephelometric Turbidity Unit **btoc=** below top of casing **Ft**=feet **°C**=Degrees Centigrade **mg/L** =milligrams per Liter **OD** = outer diameter **ID** = Inner Diameter **In**= inches

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WELL DEVELOPMENT LOG

WELL ID: NBKK-LFEX-MW01

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington			Well Depth:	39	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm), **H2S:** 0 (ppm), **LEL:** 0 %, **CO:** 0 (ppm), **O2:** 20.9 %	Start Water Level:	10.85	Ft btoc
Event Date:	November 3, 2022 2:20 PM			Water Column:	28.15	Ft
Development Team:	Charlie Royko			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Stability			Well Volume:	4.58	Gal
Equipment	Submersible Pump, YSI, Turbidity Meter, MultiRAE			Start Time:	12:20	
				End Time:	16:48	
				Total Volume Purged:	253.5	Gal
Tubing Materials:	5/8" Poly Tubing			Screened Interval:	29 - 39	Ft bgs
				Pumping/Tube Intake:	34	Ft bgs

WELL STABILIZATION DATA

Time	Pumping rate (gal/min)	Volume Removed (gal)	Water level (ft)	pH (SU)	SP. COND. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Clarity/Color
16:02	0	0	10.85	7.56	0.257	14.3	-88.9	0.61	1,000	Cloudy
12:28	2	10	11.16	7.53	0.245	14.3	-101.2	0.55	890	Cloudy
12:33	2	10	11.55	7.5	0.237	14.3	-110	0.49	871	Cloudy
12:41	2	16	12.03	7.48	0.232	14.3	-119	0.46	933	Cloudy
12:46	2	10	NR	7.46	0.229	14.3	-120	0.43	673	Cloudy
12:51	2	10	12.45	7.45	0.227	14.3	-123	0.42	637	Cloudy
12:57	2	12	NR	7.44	0.224	14.3	-124.1	0.42	583	Cloudy

13:03	2	12	NR	7.43	0.222	14.3	-125.7	0.41	449	Cloudy
13:09	2	12	13.11	7.42	0.222	14.4	-126	0.4	493	Cloudy
13:14	2	10	NR	7.41	0.219	14.3	-127.2	0.39	490	Cloudy
13:23	2	18	13.49	7.4	0.217	14.4	-129.2	0.4	486	Cloudy
13:28	2	10	NR	7.41	0.217	14.4	-131	0.4	552	Cloudy
13:40	2	24	13.9	7.39	0.215	14.3	-132.6	0.39	533	Cloudy
13:54	2	28	14.21	7.38	0.214	14.3	-134.2	0.39	452	Cloudy
14:01	2	NR	NR	7.4	0.213	14.3	-136.4	0.36	396	Cloudy
14:06	NR	NR	NR	7.37	0.213	14.3	-139.5	0.36	405	Cloudy
14:25	0	0	14.3	7.38	0.212	14.2	-130.6	0.35	488	Cloudy
14:30	2	10	NR	7.37	0.212	14.2	-132.6	0.4	316	Cloudy
14:33	NR	NR	NR	7.37	0.212	14.2	-134	0.4	250	Cloudy
16:03	0	0	NR	7.37	0.211	14.1	-134.8	0.35	168	Cloudy
16:03	2	0	NR	7.55	0.213	14.1	-90.5	1.25	326	Cloudy

16:08	1.5	4.5	12.86	7.53	0.212	14.1	-103	0.82	172	Cloudy
16:11	1.5	4.5		7.52	0.212	14.1	-110.9	0.65	160	Clear
16:19	1.5	12	13.44	7.48	0.211	14	-119	0.55	149	Clear
16:27	1.5	12	13.71	7.45	0.211	14	-122.8	0.49	121	Clear
16:36	1.5	13.5	13.93	7.43	0.211	14	-126	0.44	120	Clear
16:41	1.5	7.5	NR	7.37	0.211	14	-124	0.43	116	Clear
16:46	1.5	7.5	14.11	7.42	0.211	14	-126	0.43	105	Clear

Legend: gal/min= gallons per minute **SU**= Standard Units **mS/cm** = millisiemens per centimeter **mL/min**= milliliters per minute **mL**= milliliters **mV**= millivolts **mg/L**= micrograms per liter **NR** = not recorded **NTU**= Nephelometric Turbidity Unit **btoc=** below top of casing **Ft**=feet **°C**=Degrees Centigrade **mg/L** =milligrams per Liter **OD** = outer diameter **ID** = Inner Diameter **In**= inches

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WELL DEVELOPMENT LOG

WELL ID: NBKK-LFEX-MW02

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington			Well Depth:	28	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm), **H2S:** 0 (ppm), **LEL:** 0 %, **CO:** 0 (ppm), **O2:** 20.9 %	Start Water Level:	10.81	Ft btoc
Event Date:	November 2, 2022 5:56 PM			Water Column:	17.19	Ft
Development Team:	Charlie Royko			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Stability			Well Volume:	2.80	Gal
Equipment:	Submersible Pump, YSI, Turbidity Meter, MultiRAE			Start Time:	15:56	
				End Time:	17:14	
				Total Volume Purged:	260	Gal
Tubing Materials:	5/8" Poly Tubing			Screened Interval:	18-28	Ft bgs
				Pumping/Tube Intake:	23	Ft bgs

WELL STABILIZATION DATA

Time	Pumping rate (gal/min)	Volume Removed (gal)	Water level (ft)	pH (SU)	SP. COND. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Clarity/Color
15:57	4	0	10.81	7.86	0.197	13.7	-141.1	16.4	1,000	Cloudy
16:02	4	NR	NR	7.7	0.193	13.7	-147.7	0.86	1,000	Cloudy
16:08	4	24	11.75	7.61	0.191	13.7	-148.8	0.6	639	Cloudy
16:14	4	NR	NR	7.57	0.191	13.6	-131.5	0.54	425	Cloudy
16:18	4	16	12.25	7.56	0.191	13.6	-141.9	0.5	311	Cloudy
16:23	4	20	12.55	7.52	0.191	13.5	-145	0.5	259	Cloudy
16:28	4	20	NR	7.5	0.192	13.5	-146.6	0.49	196	Cloudy

16:32	4	16	13.05	7.49	0.192	13.6	-146.7	0.46	167	Clear
16:37	4	20	13.29	7.47	0.192	13.6	-147.2	0.47	143	Clear
16:42	4	20	13.52	7.44	0.193	13.6	-146.9	0.43	120	Clear
16:47	4	20	13.76	7.43	0.193	13.6	-147.5	0.43	103	Clear
16:52	4	20	13.98	7.42	0.194	13.6	-147.5	0.4	89	Clear
16:57	4	20	14.14	7.42	0.194	13.6	-148.1	0.41	64.8	Clear
17:01	4	16	14.33	7.41	0.195	13.6	-148.1	0.41	57.5	Clear
17:05	4	16	NR	7.39	0.195	13.6	-148.6	0.41	47.2	Clear
17:08	4	12	14.53	7.39	0.195	13.6	-148.2	0.4	46.9	Clear
17:13	4	20	14.71	7.38	0.196	13.6	-150.1	0.38	39.2	Clear

Legend: gal/min= gallons per minute **SU**= Standard Units **mS/cm** = millisiemens per centimeter **mL/min**= milliliters per minute **mL**= milliliters **mV**= millivolts **mg/L**= micrograms per liter **NR** = not recorded **NTU**= Nephelometric Turbidity Unit **btoc=** below top of casing **Ft**=feet **°C**=Degrees Centigrade **mg/L** =milligrams per Liter **OD** = outer diameter **ID** = Inner Diameter **In**= inches

JACOBS

WELL DEVELOPMENT LOG

WELL ID: NBKK-LFEX-MW03

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington			Well Depth:	29.5	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm), **H2S:** 0 (ppm), **LEL:** 0 %, **CO:** 0 (ppm), **O2:** 20.9 %	Start Water Level:	15.6	Ft btoc
Event Date:	November 4, 2022 1:45 PM			Water Column:	13.55	Ft
Development Team:	Charlie Royko			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Stability			Well Volume:	2.21	Gal
Equipment:	Submersible Pump, YSI, Turbidity Meter, MultiRAE			Start Time:	23:45	
				End Time:	12:57	
				Total Volume Purged:	62.4	Gal
Tubing Materials:	5/8" Poly Tubing			Screened Interval:	19.5-29.5	Ft bgs
				Pumping/Tube Intake:	25	Ft bgs

WELL STABILIZATION DATA

Time	Pumping rate (gal/min)	Volume Removed (gal)	Water level (ft)	pH (SU)	SP. COND. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Clarity/Color
11:46	1.8	0	15.61	7.3	0.97	16.1	17.5	0.67	1,000	Cloudy
11:50	1.8	NR	NR	7.4	0.92	16.1	-38.6	0.61	1,000	Cloudy
11:55	1.8	9	17	7.4	0.92	16.1	-68.2	0.51	1,000	Cloudy
11:58	1.8	5.4	17.32	7.4	0.92	16.1	-72.9	0.5	1,000	Cloudy
12:02	1.8	7.2	17.75	7.39	0.92	16	-92.3	0.49	1,000	Cloudy
12:07	1.8	9	NR	7.4	0.92	16	-102.3	0.46	730	Cloudy
12:13	1.8	10.8	18.42	7.37	0.92	16	-107.3	0.41	380	Cloudy

12:18	0.5	2.5	16.45	7.37	0.92	16	-112.8	0.46	90	Clear
12:22	0.5	2	NR	7.37	0.92	16	-115.9	0.41	207	Clear
12:26	0.5	2	15.86	7.37	0.92	16	-118.7	0.41	106	Clear
12:30	0.5	2	15.8	7.36	0.92	16	-120.1	0.41	81.8	Clear
12:34	0.5	2	NR	7.36	0.92	16	-122.3	0.43	79.6	Clear
12:39	0.5	2.5	15.79	7.36	0.92	16	-125	0.44	63.7	Clear
12:44	0.5	2.5	15.83	7.36	0.92	16	-126.3	0.44	59.5	Clear
12:49	0.5	2.5	15.9	7.36	0.92	16	128.1	0.44	49.9	Clear
12:53	0.5	2	15.83	7.35	0.92	16	-130.2	0.44	33.9	Clear
12:55	0.5	1	15.9	7.35	0.92	16	-129.8	0.44	37.1	Clear

Legend: gal/min= gallons per minute **SU**= Standard Units **mS/cm** = millisiemens per centimeter **mL/min**= milliliters per minute **mL**= milliliters **mV**= millivolts **mg/L**= micrograms per liter **NR** = not recorded **NTU**= Nephelometric Turbidity Unit **btoc=** below top of casing **Ft**=feet **°C**=Degrees Centigrade **mg/L** =milligrams per Liter **OD** = outer diameter **ID** = Inner Diameter **In**= inches

JACOBS

WELL DEVELOPMENT LOG

WELL ID: NBKK-LFEX-MW04

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington			Well Depth:	33	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm), **H2S:** 0 (ppm), **LEL:** 0 %, **CO:** 0 (ppm), **O2:** 20.9 %	Start Water Level:	10.61	Ft btoc
Event Date:	November 2, 2022 1:36 PM			Water Column:	22.39	Ft
Development Team:	Charlie Royko			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Stability			Well Volume:	3.65	Gal
Equipment	Submersible Pump, YSI, Turbidity Meter, MultiRAE			Start Time:	11:36	
				End Time:	13:18	
				Total Volume Purged:	198	Gal
Tubing Materials:	5/8" Poly Tubing			Screened Interval:	23-33	Ft bgs
				Pumping/Tube Intake:	28	Ft bgs

WELL STABILIZATION DATA

Time	Pumping rate (gal/min)	Volume Removed (gal)	Water level (ft)	pH (SU)	SP. COND. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Clarity/Color
11:39	2	6	NR	7.11	0.437	14.6	-77.5	3.08	1,000	Cloudy
11:47	2	16	13.68	7.1	0.439	14.5	-92.6	1.13	972	Cloudy
11:53	2	12	13.81	7.09	0.438	14.6	-98.9	0.79	812	Cloudy
11:57	2	8	NR	7.07	0.437	14.7	-101.5	0.71	740	Cloudy
12:05	2	16	14.1	7.04	0.434	14.8	-107.7	0.59	477	Cloudy
12:11	2	12	14.21	7.04	0.433	14.9	-112.5	0.52	401	Cloudy
12:16	2	10	NR	7.05	0.431	14.8	-115.1	4.7	398	Cloudy

12:21	2	10	14.35	7.03	0.429	14.6	-117.6	0.46	222	Cloudy
12:29	2	16	14.45	7.03	0.426	14.8	-121.3	0.44	212	Cloudy
12:34	2	10	NR	7.02	0.423	14.6	-122.6	0.43	172	Clear
12:42	2	16	14.56	7.01	0.419	14.6	-125.8	0.4	171	Clear
12:48	2	12	NR	7	0.419	14.6	-127.7	0.4	150	Clear
12:51	2	6	14.65	7	0.416	14.6	-128.7	0.4	99	Clear
12:55	2	8	NR	7.01	0.415	14.6	-128.1	0.4	98.7	Clear
13:01	2	12	NR	7.01	0.41	14.6	-132.1	0.39	96.9	Clear
13:07	2	12	NR	7.01	0.41	14.6	-133.7	0.38	40.6	Clear
13:09	2	4	14.83	7.01	0.4	14.6	-134.1	0.39	36	Clear
13:12	2	6	14.83	-134.2	0.41	14.6	-134.3	0.39	34.2	Clear
13:15	2	6	14.6	7	0.41	14.6	-135	0.39	33.8	Clear

Legend: gal/min= gallons per minute **SU**= Standard Units **mS/cm** = millisiemens per centimeter **mL/min**= milliliters per minute **mL**= milliliters **mV**= millivolts **mg/L**= micrograms per liter **NR** = not recorded **NTU**= Nephelometric Turbidity Unit **btoc=** below top of casing **Ft**=feet **°C**=Degrees Centigrade **mg/L** =milligrams per Liter **OD** = outer diameter **ID** = Inner Diameter **In**= inches

Appendix E
Groundwater Sampling Sheets

Table E-1. Water Quality Parameters

Site Inspection Report for Per- and Polyfluoroalkyl Substances at Naval Base Kitsap-Keyport

Keyport, Washington

Monitoring Well	Sample Date	Sample Time	Depth to Water (ft btoc)	pH	Conductivity (mS/cm)	Temperature (°C)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	PID Readings (ppm)	Comments
NBKK-B76-MW01	11/11/2022	8:24	8.50	8.50	0.450	14.83	0	-86	6.3	0.0	Clear
NBKK-B76-MW02	11/11/2022	10:50	8.72	8.72	0.388	14.15	0	-125	53.6	0.0	Clear
NBKK-B76-MW03	11/11/2022	11:50	8.52	8.52	0.475	15.21	0.86	138	7.7	0.0	Clear
NBKK-B76-MW04	11/10/2022	14:35	8.58	8.58	0.342	13.91	0	-30	75.8	0.0	Clear
NBKK-B76-MW06	8/14/2023	12:51	13.27	7.91	0.327	16.20	0.25	-246.7	8.35	0.0	Clear
NBKK-B76-MW07	8/15/2023	13:00	17.28	6.69	0.900	17.10	0.13	-28.7	3.71	0.0	Clear
NBKK-B76-MW08	8/15/2023	9:06	21.69	6.56	2.410	14.60	2.52	-54.6	3.24	0.0	Clear
NBKK-B76-MW09	8/14/2023	12:50	18.81	6.51	1.520	15.50	0.13	76.9	3.34	0.0	Clear
NBKK-CF1-MW01	12/7/2022	13:26	8.71	8.71	0.256	14.17	18.89	-405.9	3.84	0.0	Clear
NBKK-CF1-MW02	11/14/2022	9:19	8.08	8.08	0.405	14.92	0	-3	17.4	0.0	Clear
NBKK-CF1-MW03	11/11/2022	14:20	8.33	8.33	0.321	14.05	0	-57	218	0.0	Cloudy/ Gray
NBKK-OU2A5-MW01	12/1/2022	14:50	8.44	8.44	0.665	11.13	0	-113	2.5	0.0	Clear
NBKK-OU2A5-MW02	12/7/2022	12:30	8.91	8.91	0.319	13.54	18.28	-408	31.8	0.0	Clear
NBKK-OU2A5-MW03	12/1/2022	14:48	7.52	7.52	1.03	13.10	1.78	-27.9	94.9	0.0	Clear
NBKK-B1006-MW01	11/9/2022	9:25	1.50	7.33	0.323	15.92	0	28	17.4	0.0	Clear
NBKK-B1006-MW02	11/9/2022	11:50	4.97	7.09	0.344	14.30	6.77	52	2.3	0.0	Clear
NBKK-B1006-MW03	11/9/2022	13:16	4.94	6.63	0.164	16.06	5.32	256	0	0.0	Clear
NBKK-B1006-MW04	12/8/2022	7:45	2.55	6.81	0.165	12.61	33.29	41.4	2.24	0.0	Clear
NBKK-OU2A2-MW01	6/1/2023	12:15	3.01	6.23	0.324	12.45	0.46	-82	13.2	0.0	Clear
NBKK-OU2A2-MW02	12/8/2022	14:45	6.49	6.49	0.135	8.13	16.7	56.6	2.33	0.0	Clear
NBKK-OU2A2-MW03	12/8/2022	13:30	7.50	7.50	0.321	10.06	13.31	-80	8.76	0.0	Clear
NBKK-OU2A2-MW04	12/8/2022	10:45	5.59	7.18	0.276	15.23	13.09	28.8	3.86	0.0	Clear
NBKK-OU2A2-MW05	12/8/2022	12:40	7.47	7.47	0.358	15.24	13.64	-59.6	5.62	0.0	Clear
NBKK-OU2A2-MW06	12/8/2022	9:12	8.02	6.35	0.136	10.18	20.56	182.4	41.9	0.0	Clear
NBKK-OU2A2-2MW-1[a]	NS										
NBKK-OU2A2-MW2-2[a]	NS										
NBKK-OU2A2-MW2-8	12/8/2022	11:30	7.12	7.12	0.974	11.69	11.43	25.8	3.17	0.0	Clear
NBKK-S7-MW01	12/2/2022	15:35	7.57	7.57	65.6	11.76	5.91	217	0	0.0	Clear
NBKK-S7-MW02	12/2/2022	11:15	7.75	7.75	55.01	11.30	5.33	-36	7.52	0.0	Clear
NBKK-S7-MW03[b]	NS										
NBKK-S7-MW04	12/2/2022	14:10	7.36	7.36	2.58	15.51	0	-14	0	0.0	Clear
NBKK-S7-MW05	12/2/2022	11:40	7.40	7.40	46.4	12.08	0.51	121	1	0.0	Clear
NBKK-LFEX-MW01	11/10/2022	8:25	7.49	7.49	0.305	14.49	0	-53	168	0.0	Clear

Table E-1. Water Quality Parameters

Site Inspection Report for Per- and Polyfluoroalkyl Substances at Naval Base Kitsap-Keyport
Keyport, Washington

Monitoring Well	Sample Date	Sample Time	Depth to Water (ft btoc)	pH	Conductivity (mS/cm)	Temperature (°C)	Dissolved Oxygen (mg/L)	Oxidation-Reduction Potential (mV)	Turbidity (NTU)	PID Readings (ppm)	Comments
NBKK-LFEX-MW02	11/10/2022	12:25	7.89	7.89	0.245	13.93	0	-44	141	0.0	Clear
NBKK-LFEX-MW03	11/10/2022	10:20	7.62	7.62	0.305	16.22	0	-54	27.4	0.0	Clear
NBKK-LFEX-MW04	11/10/2022	10:05	7.16	7.16	0.532	14.49	0	-4	4.2	0.0	Clear

[a] Well not located during SI field work and was not sampled.

[b] Monitoring well NBKK-S7-MW03 was not installed due to access issues and other construction work occurring for the duration of the SI. Removal of this well from the SI scope is described in Field Change Request 1.

°C = degrees Celsius
btoc = below top of casing
ft = feet
mg/L = milligrams per liter
mS/cm = milliseimens per centimeter
mV = millivolts
NA = not applicable
NTU = nephelometric turbidity units
NS = not sampled
ppm = parts per million
PID = photoionization detection

GROUNDWATER SAMPLING DATA SHEET

WELL ID: NBKK-B76-MW01

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington	Casing Materials:	PVC	Well Depth:	39.00	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm)	Start Water Level:	12.04	Ft btoc
Start Date:	November 11, 2022	Weather:	Cloudy , 40 F	Water Column:	27.7	Ft
Sampling Team:	Tommy Ta, Tim Anderson			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Low Flow			Well Volume:	4.52	Gal
Equipment	Peristaltic Pump, C103193 Horiba, 22995 MultiRAE, C10331			Start Time:	08:24	
				End Time:	09:50	
				Total Volume Purged:	7.0	Gal
Tubing Materials:	HDPE 0.25" OD x 0.170" ID					
				Screened Interval:	29-39	Ft bgs
				Pumping/Tube Intake:	20	Ft btoc

Diam (in.)	Vol. (gal/ft)
1	0.041
1.25	0.064
2	0.163
4	0.653

Notes:
(mL/min) = milliliters per minute
(SU) = Standard Units
(mS/cm) = milliSiemens per centimeter
(mV) = Millivolts
(mg/L) = Milligrams per liter
(NTU) = Nephelometric Turbidity Unit
N/A = Not applicable
NM = Not measured
Ft bgs = Feet below Ground Surface
Ft btoc = Feet below top of casing

WELL STABILIZATION DATA

Time	Pumping Rate (mL/min)	Water level (ft bgs)	pH (SU)	SP. Cond. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Appearance
08:24	300	12.04	7.02	0.256	14.45	101.00	0.00	167.00	Clear
08:42	300	13.18	8.27	0.418	14.92	-32.00	NM	146.00	Clear
09:23	300	13.32	8.43	0.419	14.93	-66.00	0.00	103.00	Clear
09:29	300	13.49	8.47	0.424	14.86	-80.00	0.00	26.00	Clear
09:43	300	13.56	8.49	0.424	14.88	-84.00	0.00	9.00	Clear
09:44	300	13.55	8.50	0.450	14.83	-86.00	0.00	6.30	Clear

SAMPLE INFORMATION

Sample ID:	NBKK-B76-MW01-1122	Primary Laboratory:	Battelle
Analyses:	PFAS/LCMSMS Compliant with DoD QSM v5.3 Table B-15	Shipment Method:	FedEx
Collection Date/Time:	11/11/22 09:50	QC Sample:	N/A
Sample Comments:	None	QC Sample ID:	N/A

GROUNDWATER SAMPLING DATA SHEET

WELL ID: NBKK-B76-MW02

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington	Casing Materials:	PVC	Well Depth:	59.00	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm)	Start Water Level:	12.33	Ft btoc
Start Date:	November 11, 2022	Weather:	Partly Cloudy , 37 F	Water Column:	45.29	Ft
Sampling Team:	Tommy Ta, Tim Anderson			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Low Flow			Well Volume:	7.39	Gal
Equipment	Peristaltic Pump, C-103193 Horiba, 22995 MultiRAE, C103312			Start Time:	10:02	
				End Time:	10:55	
				Total Volume Purged:	4.5	Gal
Tubing Materials:	HDPE 0.25" OD x 0.170" ID					
				Screened Interval:	49-59	Ft bgs
				Pumping/Tube Intake:	25	Ft btoc

Diam (in.)	Vol. (gal/ft)
1	0.041
1.25	0.064
2	0.163
4	0.653

Notes:
(mL/min) = milliliters per minute
(SU) = Standard Units
(mS/cm) = milliSiemens per centimeter
(mV) = Millivolts
(mg/L) = Milligrams per liter
(NTU) = Nephelometric Turbidity Unit
N/A = Not applicable
NM = Not measured
Ft bgs = Feet below Ground Surface
Ft btoc = feet below top of casing

WELL STABILIZATION DATA

Time	Pumping Rate (mL/min)	Water level (ft bgs)	pH (SU)	SP. Cond. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Appearance
10:02	300	12.33	8.60	0.402	14.82	-30.00	0.21	11.00	Clear
10:13	300	14.03	8.66	0.398	14.59	-75.00	0.00	6.00	Clear
10:14	300	14.19	8.67	0.396	14.53	-84.00	0.00	44.60	Clear
10:21	300	14.13	8.71	0.391	14.17	-109.00	0.00	47.60	Clear
10:29	300	14.16	8.71	0.391	14.17	-117.00	0.00	51.20	Clear
10:36	300	14.18	8.71	0.388	14.19	-122.00	0.00	50.50	Clear
10:44	300	14.10	8.72	0.388	14.15	-125.00	0.00	53.60	Clear

SAMPLE INFORMATION

Sample ID:	NBKK-B76-MW02-1122	Primary Laboratory:	Battelle
Analyses:	PFAS/LCMSMS Compliant with DoD QSM v5.3 Table B-15	Shipment Method:	FedEx
Collection Date/Time:	11/11/22 10:50	QC Sample:	N/A
Sample Comments:	None	QC Sample ID:	N/A

JACOBS GROUNDWATER SAMPLING DATA SHEET

WELL ID: NBKK-B76-MW03

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington	Casing Materials:	PVC	Well Depth:	44.00	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm)	Start Water Level:	8.71	Ft btoc
Start Date:	November 11, 2022	Weather:	Partly Cloudy , 38 F	Water Column:	34.27	Ft
Sampling Team:	Tommy Ta, Tim Anderson			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Low Flow			Well Volume:	5.59	Gal
Equipment	Peristaltic Pump, GeoPump C103193 Horiba, 22995 MultiRAE, C101331			Start Time:	10:59	
				End Time:	11:48	
				Total Volume Purged:	3.8	Gal
Tubing Materials:	HDPE 0.25" OD x 0.170" ID					
				Screened Interval:	34-44	Ft bgs
				Pumping/Tube Intake:	20	Ft btoc

Diam (in.)	Vol. (gal/ft)
1	0.041
1.25	0.064
2	0.163
4	0.653

Notes:
(mL/min) = milliliters per minute
(SU) = Standard Units
(mS/cm) = milliSiemens per centimeter
(mV) = Millivolts
(mg/L) = Milligrams per liter
(NTU) = Nephelometric Turbidity Unit
N/A = Not applicable
NM = Not measured
Ft bgs = Feet below Ground Surface
Ft btoc = Feet below top of casing

WELL STABILIZATION DATA

Time	Pumping Rate (mL/min)	Water level (ft bgs)	pH (SU)	SP. Cond. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Appearance
10:59	300	8.71	8.53	0.482	16.34	146.00	3.20	76.00	Clear
11:22	300	11.78	8.52	0.478	16.26	156.00	2.39	42.30	Clear
11:33	300	1.74	8.56	0.475	15.53	154.00	1.46	42.60	Clear
11:36	300	13.33	8.55	0.476	15.31	155.00	1.06	11.30	Clear
11:42	300	13.34	8.53	0.476	15.25	148.00	0.97	8.10	Clear
11:47	300	13.88	8.52	0.475	15.21	138.00	0.86	7.70	Clear

SAMPLE INFORMATION

Sample ID:	NBKK-B76-MW03-1122	Primary Laboratory:	Battelle
Analyses:	PFAS/LCMSMS Compliant with DoD QSM v5.3 Table B-15	Shipment Method:	FedEx
Collection Date/Time:	11/11/22 11:50	QC Sample:	N/A
Sample Comments:	None	QC Sample ID:	N/A

GROUNDWATER SAMPLING DATA SHEET

WELL ID: NBKK-B76-MW04

JACOBS

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington	Casing Materials:	PVC	Well Depth:	69.05	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm)	Start Water Level:	22.07	Ft btoc
Start Date:	November 10, 2022	Weather:	Partly Cloudy , 40 F	Water Column:	46.98	Ft
Sampling Team:	Tim Anderson, Nathan Leu			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Low Flow			Well Volume:	7.67	Gal
Equipment	Peristaltic Pump, Horiba, MultiRAE,			Start Time:	13:52	
				End Time:	14:35	
				Total Volume Purged:	4.0	Gal
Tubing Materials:	HDPE 0.25" OD x 0.170" ID					
				Screened Interval:	59-69	Ft bgs
				Pumping/Tube Intake:	60	Ft btoc

Diam (in.)	Vol. (gal/ft)
1	0.041
1.25	0.064
2	0.163
4	0.653

Notes:
(mL/min) = milliliters per minute
(SU) = Standard Units
(mS/cm) = milliSiemens per centimeter
(mV) = Millivolts
(mg/L) = Milligrams per liter
(NTU) = Nephelometric Turbidity Unit
N/A = Not applicable
NM = Not measured
Ft bgs = Feet below Ground Surface
Ft btoc = Feet below top of casing

WELL STABILIZATION DATA

Time	Pumping Rate (mL/min)	Water level (ft bgs)	pH (SU)	SP. Cond. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Appearance
13:52	300	22.07	8.26	0.339	13.92	33.00	1.27	139.00	Clear
14:02	300	22.20	8.50	0.342	14.16	2.00	0.00	148.00	Clear
14:13	300	22.21	8.54	0.342	14.03	-12.00	0.00	105.00	Clear
14:20	300	22.22	8.56	0.342	13.96	-21.00	0.00	87.70	Clear
14:26	300	22.18	8.57	0.342	13.94	-27.00	0.00	79.40	Clear
14:32	300	22.18	8.58	0.342	13.91	-30.00	0.00	75.80	Clear

SAMPLE INFORMATION

Sample ID:	NBKK-B76-MW04-1122	Primary Laboratory:	Battelle
Analyses:	PFAS/LCMSMS Compliant with DoD QSM v5.3 Table B-15	Shipment Method:	FedEx
Collection Date/Time:	11/10/22 14:35	QC Sample:	YES
Sample Comments:	None	QC Sample ID:	NBKK-B76-EB01-111122-GW

JACOBS GROUNDWATER SAMPLING DATA SHEET

WELL ID: NBKK-B76-MW06

Project Name:	NBK Keyport, Additional Investigation (Building 76)	Casing Materials:	PVC	Well Depth:	32.30	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm)	Start Water Level:	11.22	Ft btoc
Start Date:	August 14, 2023	Weather:	Sunny , 83 F	Water Column:	21.10	Ft
Sampling Team:	Lyndsey Kleppin, Tommy Ta			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Low Flow			Well Volume:	3.44	Gal
Equipment	Peristaltic Pump, Geopump YSI (C103140), Turbidity Meter, MultiRAE (# 23801)			Start Time:	12:51	
				End Time:	15:30	
				Total Volume Purged:	Approximately 5.50	Gal
Tubing Materials:	HDPE, Flex Tubing 1/4 inch					
				Screened Interval:	22 - 32	Ft-bgs
				Pumping/Tube Intake:	27	Ft btoc

Diam (in.)	Vol. (gal/ft)
1	0.041
1.25	0.064
2	0.163
4	0.653

Notes:
(mL/min) = milliliters per minute
(SU) = Standard Units
(mS/cm) = milliSiemens per centimeter
(mV) = Millivolts
(mg/L) = Milligrams per liter
(NTU) = Nephelometric Turbidity Unit

WELL STABILIZATION DATA

Time	Pumping Rate (mL/min)	Water level (ft)	pH (SU)	SP. Cond. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Appearance
12:56	250	12.66	7.44	0.304	14.30	-123.30	1.08	314.00	
13:01	250	13.01	7.42	0.305	14.10	-129.50	0.95	163.00	Cloudy White
13:06	225	13.14	7.46	0.313	14.40	-155.60	0.64	108.00	Cloudy White
13:14	225	13.25	7.52	0.314	14.20	-169.80	0.52	97.50	Cloudy White
13:20	225	13.30	7.55	0.317	14.60	-181.40	0.46	55.60	Cloudy White
13:25	225	13.21	7.59	0.318	14.80	-188.20	0.44	57.20	Cloudy White
13:29	225	13.24	7.61	0.320	14.50	-194.50	0.41	55.10	Cloudy White

WELL STABILIZATION DATA									
Time	**Pumping Rate (mL/min)**	**Water level (ft)**	**pH (SU)**	**SP. Cond. (mS/cm)**	**Temp. (°C)**	**ORP (mV)**	**D.O. (mg/L)**	**Turbidity (NTU)**	**Appearance**
13:35	225	13.35	7.60	0.320	14.40	-199.50	0.39	44.70	Clear
13:40	225	13.40	7.63	0.319	14.40	-203.40	0.37	33.10	Clear
13:46	225	13.48	7.62	0.319	14.50	-206.50	0.35	49.40	Clear
13:51	225	13.45	7.69	0.322	14.90	-213.20	0.34	33.70	Clear
13:56	225	13.44	7.72	0.321	14.90	-219.60	0.34	32.30	Clear
14:01	225	13.49	7.73	0.321	14.90	-221.10	0.32	26.40	Clear
14:06	225	13.50	7.73	0.323	14.80	-224.90	0.32	31.60	Clear
14:16	225	13.48	7.81	0.323	15.30	-224.30	0.30	22.60	Clear
14:23	225	13.42	7.87	0.325	15.60	-230.00	0.28	22.60	Clear
14:29	225	13.31	7.00	0.326	15.90	-233.90	0.28	16.20	Clear
14:38	225	13.28	7.91	0.324	16.70	-236.60	0.28	12.40	Clear
14:45	225	13.25	7.90	0.327	15.90	-241.60	0.29	9.79	Clear
14:58	225	13.23	7.83	0.327	16.20	-242.20	0.25	10.10	Clear
15:06	225	13.29	7.89	0.326	16.10	-247.00	0.25	8.58	Clear
15:13	225	13.27	7.91	0.327	16.20	-246.70	0.25	8.35	Clear

SAMPLE INFORMATION

Sample ID:	NBKK-B76-MW06-0823	Primary Laboratory:	Battelle
Analyses:	PFAS (list of 18)	Shipment Method:	Fed-Ex
Collection Date/Time:	08/14/23 / 15:17	QC Sample:	YES
Sample Comments:	None	QC Sample ID:	NBKK-B76-MW06P0823

JACOBS GROUNDWATER SAMPLING DATA SHEET

WELL ID: NBKK-B76-MW07

Project Name:	NBK Keyport, Additional Investigation (Building 76)	Casing Materials:	PVC	Well Depth:	33.40	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm) **VOC:** 0 (ppm)	Start Water Level:	15.29	Ft btoc
Start Date:	August 15, 2023	Weather:	Sunny , 86 F	Water Column:	18.11	Ft
Sampling Team:	Lyndsey Kleppin, Tommy Ta			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Low Flow			Well Volume:	2.95	Gal
Equipment	Peristaltic Pump, Geopump (C-103198), YSI (C-103140), Turbidity Meter, MultiRAE (#23801)			Start Time:	13:00	
				End Time:	14:00	
				Total Volume Purged:	Approximately 2.50	Gal
Tubing Materials:	HDPE, Flex Tubing ¼ inch					
				Screened Interval:	23 - 33	Ft-bgs
				Pumping/Tube Intake:	28	Ft btoc

Diam (in.)	Vol. (gal/ft)
1	0.041
1.25	0.064
2	0.163
4	0.653

Notes:
(mL/min) = milliliters per minute
(SU) = Standard Units
(mS/cm) = milliSiemens per centimeter
(mV) = Millivolts
(mg/L) = Milligrams per liter
(NTU) = Nephelometric Turbidity Unit

WELL STABILIZATION DATA

Time	Pumping Rate (mL/min)	Water level (ft)	pH (SU)	SP. Cond. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Appearance
13:00	200	16.89	6.68	0.900	16.60	-4.90	0.48	13.60	Clear
13:15	200	16.93	6.64	0.900	17.40	-6.60	0.15	7.61	Clear
13:23	200	17.00	6.64	0.900	17.10	-17.30	0.10	7.73	Clear
13:31	200	17.00	6.66	0.900	17.40	-20.40	0.10	6.47	Clear
13:38	200	17.23	6.68	0.890	16.30	-25.60	0.15	4.99	Clear
13:48	200	17.28	6.69	0.900	17.10	-28.70	0.13	3.71	Clear

SAMPLE INFORMATION			
Sample ID:	NBKK-B76-MW07-0823	Primary Laboratory:	Battelle
Analyses:	PFAS (list of 18)	Shipment Method:	Fed-Ex
Collection Date/Time:	08/15/23 / 13:51	QC Sample:	N/A
Sample Comments:	None	QC Sample ID:	N/A

JACOBS GROUNDWATER SAMPLING DATA SHEET

WELL ID: NBKK-B76-MW08

Project Name:	NBK Keyport, Additional Investigation (Building 76)	Casing Materials:	PVC	Well Depth:	35.02	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm)	Start Water Level:	20.56	Ft btoc
Start Date:	August 15, 2023	Weather:	Sunny , 72 F	Water Column:	14.46	Ft
Sampling Team:	Lyndsey Kleppin, Tommy Ta			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Low Flow			Well Volume:	2.35	Gal
Equipment	Peristaltic Pump, Geopump (C-103198) YSI (C-103104), Turbidity Meter, MultiRAE (#23801)			Start Time:	09:06	
				End Time:	10:00	
				Total Volume Purged:	Approximately 2.50	Gal
Tubing Materials:	HDPE, Flex Tubing ¼ inch					
				Screened Interval:	24 - 34	Ft-bgs
				Pumping/Tube Intake:	30	Ft btoc

Diam (in.)	Vol. (gal/ft)
1	0.041
1.25	0.064
2	0.163
4	0.653

Notes:
(mL/min) = milliliters per minute
(SU) = Standard Units
(mS/cm) = milliSiemens per centimeter
(mV) = Millivolts
(mg/L) = Milligrams per liter
(NTU) = Nephelometric Turbidity Unit

WELL STABILIZATION DATA

Time	Pumping Rate (mL/min)	Water level (ft)	pH (SU)	SP. Cond. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Appearance
09:15	200	21.26	6.50	2.430	14.40	-45.80	2.69	4.79	Clear
09:20	200	21.45	6.50	2.440	14.40	-49.90	2.76	5.34	Clear
09:26	200	21.52	6.52	2.450	14.20	-50.60	2.81	3.35	Clear
09:32	200	21.50	6.54	2.430	14.40	-55.70	2.72	3.57	Clear
09:37	200	21.68	6.56	2.430	14.30	-55.40	2.61	4.01	Clear
09:42	200	21.69	6.56	2.410	14.60	-54.60	2.52	3.24	Clear

SAMPLE INFORMATION			
Sample ID:	NBKK-B76-MW08-0823	Primary Laboratory:	Battelle
Analyses:	PFAS (list of 18)	Shipment Method:	Fed-Ex
Collection Date/Time:	08/15/23 / 09:49	QC Sample:	N/A
Sample Comments:	None	QC Sample ID:	N/A

JACOBS GROUNDWATER SAMPLING DATA SHEET

WELL ID: NBKK-B76-MW09

Project Name:	NBK Keyport, Additional Investigation (Building 76)	Casing Materials:	PVC	Well Depth:	29.42	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm)	Start Water Level:	18.30	Ft btoc
Start Date:	August 14, 2023	Weather:	Sunny , 90 F	Water Column:	11.12	Ft
Sampling Team:	Lyndsey Kleppin, Tommy Ta			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Low Flow			Well Volume:	1.81	Gal
Equipment	Peristaltic Pump, Geopump, 103198 YSI (C-103140), Turbidity Meter, MultiRAE (#23801)			Start Time:	14:35	
				End Time:	16:25	
				Total Volume Purged:	Approximately 5.0	Gal
Tubing Materials:	HDPE, Flex Tubing ¼ inch					
				Screened Interval:	18.63 - 28.63	Ft-bgs
				Pumping/Tube Intake:	24.20	Ft btoc

Diam (in.)	Vol. (gal/ft)
1	0.041
1.25	0.064
2	0.163
4	0.653

Notes:
(mL/min) = milliliters per minute
(SU) = Standard Units
(mS/cm) = milliSiemens per centimeter
(mV) = Millivolts
(mg/L) = Milligrams per liter
(NTU) = Nephelometric Turbidity Unit

WELL STABILIZATION DATA

Time	Pumping Rate (mL/min)	Water level (ft)	pH (SU)	SP. Cond. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Appearance
14:45	400	18.30	6.62	1.450	15.50	92.80	0.24	5.06	Clear
15:50	400	18.52	6.57	1.490	15.40	85.80	0.21	6.65	Clear
15:56	400	18.67	6.54	1.490	15.50	80.60	0.16	6.07	Clear
16:03	400	18.76	6.52	1.510	15.60	77.90	0.14	3.92	Clear
16:11	400	18.81	6.51	1.520	15.50	76.90	0.13	3.34	Clear

SAMPLE INFORMATION			
Sample ID:	NBKK-B76-MW09-0823	Primary Laboratory:	Battelle
Analyses:	PFAS (list of 18)	Shipment Method:	Fed-Ex
Collection Date/Time:	08/14/23 16:13	QC Sample:	YES
Sample Comments:	None	QC Sample ID:	NBKK-B76-MW09-0823-MS, NBKK-B76-MW09-0823-MSD

GROUNDWATER SAMPLING DATA SHEET

WELL ID: NBKK-CF1-MW01

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington	Casing Materials:	PVC	Well Depth:	63.00	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm)	Start Water Level:	22.08	Ft btoc
Start Date:	December 7, 2022	Weather:	Partly Cloudy , 40 F	Water Column:	37.92	Ft
Sampling Team:	Jordan Peery Lemon, Tim Anderson			Well Diameter:	2	In
Purge Method:	Low Flow			Volume per Foot:	0.163	Gal/ft
Equipment	Peristaltic Pump, YSI, Turbidity Meter, MultiRAE,			Well Volume:	6.181	Gal
				Start Time:	13:26	
				End Time:	13:55	
				Total Volume Purged:	2.3	Gal
Tubing Materials:	HDPE1/4			Screened Interval:	53-63	Ft-bgs
				Pumping/Tube Intake:	55	Ft btoc

Diam (in.)	Vol. (gal/ft)
1	0.041
1.25	0.064
2	0.163
4	0.653

Notes:
(mL/min) = milliliters per minute
(SU) = Standard Units
(mS/cm) = milliSiemens per centimeter
(mV) = Millivolts
(mg/L) = Milligrams per liter
(NTU) = Nephelometric Turbidity Unit
N/A = Not applicable
Ft bgs = Feet below ground surface
Ft btoc = Feet below top of casing

WELL STABILIZATION DATA

Time	Pumping Rate (mL/min)	Water level (ft)	pH (SU)	SP. Cond. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Appearance
13:26	300	20.08	8.66	0.259	14.30	-317.90	16.05	4.25	Clear
13:35	300	24.20	8.70	0.256	14.36	-429.90	19.31	4.32	Clear
13:41	300	25.08	8.70	0.256	14.25	-431.60	19.94	4.02	Clear
13:48	300	25.59	8.71	0.256	14.20	-424.70	19.42	4.10	Clear
13:55	300	25.89	8.71	0.256	14.17	-405.90	18.89	3.84	Clear

SAMPLE INFORMATION

Sample ID:	NBKK-CF1-MW01-1222	Primary Laboratory:	Battelle
Analyses:	PFAS/LCMSMS Compliant with DoD QSM v5.3 Table B-15	Shipment Method:	FedEx
Collection Date/Time:	12/07/22 13:26	QC Sample:	N/A
Sample Comments:	None	QC Sample ID:	N/A

JACOBS GROUNDWATER SAMPLING DATA SHEET

WELL ID: NBKK-CF1-MW02

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington	Casing Materials:	PVC	Well Depth:	65.00	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm)	Start Water Level:	29.69	Ft btoc
Start Date:	November 14, 2022	Weather:	Partly Cloudy , 39 F	Water Column:	33.23	Ft
Sampling Team:	Nathan Leu, Tim Anderson			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Low Flow			Well Volume:	5.42	Gal
Equipment	Bladder Pump, Horiba, MultiRAE,			Start Time:	09:55	
				End Time:	11:00	
				Total Volume Purged:	3.1	Gal
Tubing Materials:	HDPE 0.25" OD x 0.170" ID					
				Screened Interval:	55-65	Ft bgs
				Pumping/Tube Intake:	50	Ft btoc

Diam (in.)	Vol. (gal/ft)
1	0.041
1.25	0.064
2	0.163
4	0.653

Notes:
(mL/min) = milliliters per minute
(SU) = Standard Units
(mS/cm) = milliSiemens per centimeter
(mV) = Millivolts
(mg/L) = Milligrams per liter
(NTU) = Nephelometric Turbidity Unit
N/A = Not applicable
NM = Not measured
Ft bgs = Feet below Ground Surface
Ft btoc = Feet below top of casing

WELL STABILIZATION DATA

Time	Pumping Rate (mL/min)	Water level (ft bgs)	pH (SU)	SP. Cond. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Appearance
09:55	300	29.69	8.08	0.407	13.92	-29.00	0.00	125.00	Clear
10:01	300	32.67	8.04	0.400	14.61	-13.00	7.60	145.00	Clear
10:03	300	34.72	8.04	0.398	14.61	-5.00	18.20	110.00	Clear
10:08	300	35.42	8.04	0.398	14.67	-3.00	14.70	96.10	Clear
10:13	300	36.10	8.05	0.398	14.78	1.00	10.90	62.40	Clear
10:18	300	36.81	8.06	0.398	14.77	1.00	6.60	37.10	Clear
10:28	300	38.55	8.07	0.399	14.87	1.00	3.00	26.20	Clear
10:30	300	37.95	8.08	0.403	14.88	-3.00	6.00	19.40	Clear
10:34	300	38.35	8.08	0.405	14.92	-3.00	0.00	17.40	Clear

SAMPLE INFORMATION

Sample ID:	NBKK-CF1-MW02-1122	Primary Laboratory:	Battelle
Analyses:	PFAS/LCMSMS Compliant with DoD QSM v5.3 Table B-15	Shipment Method:	FedEx
Collection Date/Time:	11/14/22	QC Sample:	N/A

	09:19		
Sample Comments:	None	QC Sample ID:	N/A

JACOBS GROUNDWATER SAMPLING DATA SHEET

WELL ID: NBKK-CF1-MW03

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington	Casing Materials:	PVC	Well Depth:	63.50	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm)	Start Water Level:	22.42	Ft btoc
Start Date:	November 11, 2022	Weather:	Cloudy , 37 F	Water Column:	41.08	Ft
Sampling Team:	Tommy Ta, Tim Anderson			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Low Flow			Well Volume:	6.696	Gal
Equipment	Bladder Pump, MicroPurge 47527 Horiba, 22995 MultiRAE, C103312			Start Time:	12:32	
				End Time:	14:18	
				Total Volume Purged:	6.5	Gal
Tubing Materials:	HDPE 0.25" OD x 0.170" ID					

Diam (in.)	Vol. (gal/ft)
1	0.041
1.25	0.064
2	0.163
4	0.653

Notes:
(mL/min) = milliliters per minute
(SU) = Standard Units
(mS/cm) = milliSiemens per centimeter
(mV) = Millivolts
(mg/L) = Milligrams per liter
(NTU) = Nephelometric Turbidity Unit
N/A = Not applicable
NM = Not measured
Ft bgs = Feet below Ground Surface
Ft btoc = Feet below top of casing

Screened Interval:	53.5-63.5	Ft bgs
Pumping/Tube Intake:	49	Ft btoc

WELL STABILIZATION DATA

Time	Pumping Rate (mL/min)	Water level (ft bgs)	pH (SU)	SP. Cond. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Appearance
12:32	300	22.42	8.44	0.325	14.30	-9.00	0.00	465.00	Clear
13:42	300	24.88	8.43	0.324	14.09	-37.00	0.00	121.00	Clear
13:48	300	25.00	8.43	0.323	14.00	-48.00	0.00	364.00	Clear
13:55	300	25.10	8.38	0.320	14.03	-51.00	0.00	379.00	Cloudy, Grey
14:01	300	25.13	8.37	0.319	13.97	-52.00	0.00	357.00	Cloudy, Grey
14:05	300	25.25	8.35	0.321	14.03	-53.00	0.00	294.00	Cloudy, Grey
14:09	300	25.28	8.35	0.321	13.99	-55.00	0.00	242.00	Cloudy, Grey
14:13	300	25.29	8.34	0.321	14.01	-57.00	0.00	235.00	Cloudy, Grey
14:18	300	25.33	8.33	0.321	14.05	-57.00	0.00	218.00	Cloudy, Grey

SAMPLE INFORMATION

Sample ID:	NBKK-CF1-MW03-1122	Primary Laboratory:	Battelle
Analyses:	PFAS/LCMSMS Compliant with DoD QSM v5.3 Table B-15	Shipment Method:	FedEx
Collection Date/Time:	11/11/22 14:20	QC Sample:	N/A
Sample Comments:	None	QC Sample ID:	N/A

JACOBS GROUNDWATER SAMPLING DATA SHEET

WELL ID: NBKK-OU2A5-MW01

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington	Casing Materials:	PVC	Well Depth:	60.04	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm)	Start Water Level:	11.81	Ft btoc
Start Date:	December 1, 2022	Weather:	Cloudy , 36 F	Water Column:	48.23	Ft
Sampling Team:	Aaron Vogt and Joey Velasquez			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Low Flow			Well Volume:	7.87	Gal
Equipment	Peristaltic Pump, Geotech, GeoPump, C-103193 Horiba, Horiba, U-5000, 4259F4FD MultiRAE, RaeSystems, MultiRae, C103104			Start Time:	14:11	
				End Time:	14:44	
				Total Volume Purged:	1.8	Gal
Tubing Materials:	HDPE 0.25" OD x 0.170" ID					
				Screened Interval:	40-60	Ft bgs
				Pumping/Tube Intake:	50	Ft btoc

Diam (in.)	Vol. (gal/ft)
1	0.041
1.25	0.064
2	0.163
4	0.653

Notes:
(mL/min) = milliliters per minute
(SU) = Standard Units
(mS/cm) = milliSiemens per centimeter
(mV) = Millivolts
(mg/L) = Milligrams per liter
(NTU) = Nephelometric Turbidity Unit
N/A = Not applicable
NM = Not measured
Ft bgs = Feet below Ground Surface
Ft btoc = Feet below top of casing

WELL STABILIZATION DATA

Time	Pumping Rate (mL/min)	Water level (ft bgs)	pH (SU)	SP. Cond. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Appearance
14:19	300	16.71	8.18	0.667	11.37	-71.00	0.00	37.10	Clear
14:26	300	18.23	8.36	0.666	11.18	-101.00	0.00	22.80	Clear
14:31	300	18.94	8.39	0.667	11.16	-107.00	0.00	10.50	Clear
14:37	300	19.90	8.43	0.666	11.20	-111.00	0.00	4.10	Clear
14:42	300	20.51	8.44	0.665	11.13	-113.00	0.00	2.50	Clear

SAMPLE INFORMATION

Sample ID:	NBKK-OU2A5-MW01-1222	Primary Laboratory:	Battelle
Analyses:	PFAS/LCMSMS Compliant with DoD QSM v5.3 Table B-15	Shipment Method:	FedEx
Collection Date/Time:	12/01/22 14:50	QC Sample:	N/A
Sample Comments:	None	QC Sample ID:	N/A

JACOBS GROUNDWATER SAMPLING DATA SHEET

WELL ID: NBKK-OU2A5-MW02

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington	Casing Materials:	PVC	Well Depth:	60.00	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm)	Start Water Level:	9.7	Ft btoc
Start Date:	December 7, 2022	Weather:	Sunny , 45 F	Water Column:	50.3	Ft
Sampling Team:	Jordan Peery Lemon, Tim Anderson			Well Diameter:	2	In
Purge Method:	Low Flow			Volume per Foot:	0.163	Gal/ft
Equipment	Peristaltic Pump, Geopump, C-103193 YSI, MultiRAE			Well Volume:	8.21	Gal
				Start Time:	11:58	
				End Time:	12:30	
				Total Volume Purged:	2.1	Gal
Tubing Materials:	HDPE 0.25" OD x 0.170" ID					
				Screened Interval:	40-60	Ft bgs
				Pumping/Tube Intake:	50	Ft btoc

Diam (in.)	Vol. (gal/ft)
1	0.041
1.25	0.064
2	0.163
4	0.653

Notes:
(mL/min) = milliliters per minute
(SU) = Standard Units
(mS/cm) = milliSiemens per centimeter
(mV) = Millivolts
(mg/L) = Milligrams per liter
(NTU) = Nephelometric Turbidity Unit
N/A = Not applicable
NM = Not measured
Ft bgs = Feet below Ground Surface
Ft btoc = Feet below top of casing

WELL STABILIZATION DATA

Time	Pumping Rate (mL/min)	Water level (ft bgs)	pH (SU)	SP. Cond. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Appearance
11:58	300	9.71	8.64	0.319	13.59	-281.00	26.32	100.00	Clear
12:04	300	14.72	8.84	0.313	13.64	-380.80	21.30	68.70	Clear
12:09	300	15.16	8.87	0.314	13.62	-392.10	18.40	39.40	Clear
12:15	300	16.19	8.90	0.317	13.60	-393.80	17.85	34.40	Clear
12:24	300	17.07	8.91	0.319	13.54	-408.00	18.28	31.80	Clear

SAMPLE INFORMATION

Sample ID:	NBKK-OU2A5-MW02-1222	Primary Laboratory:	Battelle
Analyses:	PFAS/LCMSMS Compliant with DoD QSM v5.3 Table B-15	Shipment Method:	FedEx
Collection Date/Time:	12/07/22 12:30	QC Sample:	N/A
Sample Comments:	None	QC Sample ID:	N/A

GROUNDWATER SAMPLING DATA SHEET

WELL ID: NBKK-OU2A5-MW03

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington	Casing Materials:	PVC	Well Depth:	39.90	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm)	Start Water Level:	13.39	Ft btoc
Start Date:	December 1, 2022	Weather:	Cloudy , 38 F	Water Column:	26.51	Ft
Sampling Team:	Other Aaron Vogt, Joey Velasquez			Well Diameter:	2	In
Purge Method:	Low Flow			Volume per Foot:	0.163	Gal/ft
Equipment	Peristaltic Pump, 034906 YSI, Turbidity Meter, 042127 MultiRAE			Well Volume:	4.33	Gal
				Start Time:	14:40	
				End Time:	15:25	
				Total Volume Purged:	3.5	Gal
Tubing Materials:	HDPE 0.25" OD x 0.170" ID			Screened Interval:	20-40	Ft bgs
				Pumping/Tube Intake:	35	Ft btoc

Diam (in.)	Vol. (gal/ft)
1	0.041
1.25	0.064
2	0.163
4	0.653

Notes:
(mL/min) = milliliters per minute
(SU) = Standard Units
(mS/cm) = milliSiemens per centimeter
(mV) = Millivolts
(mg/L) = Milligrams per liter
(NTU) = Nephelometric Turbidity Unit
N/A = Not applicable
NM = Not measured
Ft bgs = Feet below Ground Surface
Ft btoc = Feet below top of casing

WELL STABILIZATION DATA

Time	Pumping Rate (mL/min)	Water level (ft bgs)	pH (SU)	SP. Cond. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Appearance
14:50	200	17.06	7.52	1.050	13.00	-2.60	1.29	117.00	Clear
15:00	200	18.21	7.52	1.050	12.80	-30.10	1.24	129.00	Cloudy, Milky
15:05	200	19.40	7.51	1.050	13.10	-27.00	1.39	102.00	Cloudy, Milky
15:10	200	20.13	7.49	1.040	13.10	-25.00	1.74	93.80	Clear
15:15	200	20.82	7.50	1.040	13.00	-25.00	1.76	91.80	Clear
15:20	200	21.93	7.52	1.030	13.10	-27.90	1.78	94.90	Clear

SAMPLE INFORMATION

Sample ID:	NBKK-OU2A5-MW03-1222	Primary Laboratory:	Battelle
Analyses:	PFAS/LCMSMS Compliant with DoD QSM v5.3 Table B-15	Shipment Method:	FedEx
Collection Date/Time:	12/01/22 15:25	QC Sample:	N/A
Sample Comments:	None	QC Sample ID:	N/A

GROUNDWATER SAMPLING DATA SHEET

WELL ID: NBKK-B1006-MW01

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington	Casing Materials:	PVC	Well Depth:	14.00	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm)	Start Water Level:	1.81	Ft btoc
Start Date:	November 9, 2022	Weather:	Cloudy , 15.79 F	Water Column:	10.69	Ft
Sampling Team:	Tommy Ta, Tim Anderson			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Low Flow			Well Volume:	1.74	Gal
Equipment:	Peristaltic Pump, C101699 Turbidity Meter, MultiRAE, MultiRae 3540			Start Time:	09:25	
				End Time:	10:40	
				Total Volume Purged:	4.5	Gal
Tubing Materials:	HDPE 0.25" OD x 0.170" ID			Screened Interval:	4-14	Ft bgs
				Pumping/Tube Intake:	8	Ft btoc

Diam (in.)	Vol. (gal/ft)
1	0.041
1.25	0.064
2	0.163
4	0.653

Notes:
(mL/min) = milliliters per minute
(SU) = Standard Units
(mS/cm) = milliSiemens per centimeter
(mV) = Millivolts
(mg/L) = Milligrams per liter
(NTU) = Nephelometric Turbidity Unit
N/A = Not applicable
NM = Not measured
Ft bgs = Feet below Ground Surface
Ft btoc= Feet below ground surface

WELL STABILIZATION DATA

Time	Pumping Rate (mL/min)	Water level (ft bgs)	pH (SU)	SP. Cond. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Appearance
09:25	300	1.81	6.61	0.359	15.13	186.00	0.00	115.00	Clear
10:11	300	NM	7.02	0.309	15.78	85.00	0.00	69.20	Clear
10:17	300	NM	7.19	0.311	15.75	54.00	0.00	67.90	Clear
10:24	300	NM	7.25	0.314	15.86	40.00	0.00	53.00	Clear
10:26	300	NM	7.30	0.380	15.80	33.00	0.00	33.60	Clear
10:34	300	NM	7.32	0.321	15.88	29.00	0.00	22.20	Clear
10:40	300	1.50	7.33	0.323	15.92	28.00	0.00	17.40	Clear

SAMPLE INFORMATION

Sample ID:	NBKK-B1006-MW01-1122	Primary Laboratory:	Battelle
Analyses:	PFAS/LCMSMS Compliant with DoD QSM v5.3 Table B-15	Shipment Method:	FedEx
Collection Date/Time:	11/09/22 10:40	QC Sample:	N/A
Sample Comments:	None	QC Sample ID:	N/A

JACOBS GROUNDWATER SAMPLING DATA SHEET

WELL ID: NBKK-B1006-MW02

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington	Casing Materials:	PVC	Well Depth:	13.80	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm)	Start Water Level:	0.6	Ft btoc
Start Date:	November 9, 2022	Weather:	Partly Cloudy , 13.57 F	Water Column:	13.2	Ft
Sampling Team:	Tommy Ta, Tim Anderson			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Low Flow			Well Volume:	2.15	Gal
Equipment	Peristaltic Pump, GeoPump, C101699 MultiRAE, MultiRae 3540			Start Time:	11:12	
				End Time:	11:50	
				Total Volume Purged:	4.0	Gal
Tubing Materials:	HDPE 0.25" OD x 0.170" ID					
				Screened Interval:	4-14	Ft bgs
				Pumping/Tube Intake:	7	Ft btoc

Diam (in.)	Vol. (gal/ft)
1	0.041
1.25	0.064
2	0.163
4	0.653

Notes:
(mL/min) = milliliters per minute
(SU) = Standard Units
(mS/cm) = milliSiemens per centimeter
(mV) = Millivolts
(mg/L) = Milligrams per liter
(NTU) = Nephelometric Turbidity Unit
N/A = Not Analyzed
NM = Not measured
Ft bgs = Feet below Ground Surface
Ft btoc = Feet below top of casing

WELL STABILIZATION DATA

Time	Pumping Rate (mL/min)	Water level (ft bgs)	pH (SU)	SP. Cond. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Appearance
11:12	300	3.33	7.17	0.334	13.36	0.00	11.40	7.50	Clear
11:32	300	4.65	6.97	0.340	13.87	9.00	0.00	8.70	Clear
11:36	300	4.96	7.02	0.335	14.37	42.00	6.70	16.30	Clear
11:43	300	4.97	7.09	0.348	14.28	53.00	6.90	7.30	Clear
11:45	300	4.97	7.09	0.344	14.30	52.00	6.77	2.30	Clear

SAMPLE INFORMATION

Sample ID:	NBKK-B1006-MW02-1122	Primary Laboratory:	Battelle
Analyses:	PFAS/LCMSMS Compliant with DoD QSM v5.3 Table B-15	Shipment Method:	FedEx
Collection Date/Time:	11/09/22 11:50	QC Sample:	N/A
Sample Comments:	None	QC Sample ID:	N/A

GROUNDWATER SAMPLING DATA SHEET

WELL ID: NBKK-B1006-MW03

JACOBS

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington	Casing Materials:	PVC	Well Depth:	15.49	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm)	Start Water Level:	4.84	Ft btoc
Start Date:	November 9, 2022	Weather:	Partly Cloudy , 16.08 F	Water Column:	10.65	Ft
Sampling Team:	Tommy Ta, Tim Anderson			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Low Flow			Well Volume:	1.74	Gal
Equipment	Peristaltic Pump, GeoPump C101649 MultiRAE, MultiRae 3540			Start Time:	12:49	
				End Time:	13:20	
				Total Volume Purged:	3.5	Gal
Tubing Materials:	HDPE 0.25" OD x 0.170" ID					
				Screened Interval:	6-16	Ft bgs
				Pumping/Tube Intake:	9	Ft btoc

Diam (in.)	Vol. (gal/ft)
1	0.041
1.25	0.064
2	0.163
4	0.653

Notes:
(mL/min) = milliliters per minute
(SU) = Standard Units
(mS/cm) = milliSiemens per centimeter
(mV) = Millivolts
(mg/L) = Milligrams per liter
(NTU) = Nephelometric Turbidity Unit
N/A = Not analyzed
NM = Not measured
Ft bgs = Feet below Ground Surface
Ft btoc = Feet below top of casing

WELL STABILIZATION DATA

Time	Pumping Rate (mL/min)	Water level (ft bgs)	pH (SU)	SP. Cond. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Appearance
12:49	300	4.80	6.83	0.158	15.66	230.00	1.88	11.50	Clear
13:02	300	4.98	6.66	0.163	16.09	247.00	6.22	9.50	Clear
13:09	300	4.95	6.63	0.159	16.06	255.00	5.65	2.20	Clear
13:13	300	4.94	6.63	0.164	16.06	256.00	5.32	0.00	Clear

SAMPLE INFORMATION

Sample ID:	NBKK-B1006-MW03-1122	Primary Laboratory:	Battelle
Analyses:	PFAS/LCMSMS Compliant with DoD QSM v5.3 Table B-15	Shipment Method:	FedEx
Collection Date/Time:	11/09/22 13:16	QC Sample:	N/A
Sample Comments:	None	QC Sample ID:	N/A

GROUNDWATER SAMPLING DATA SHEET

WELL ID: NBKK-B1006-MW04

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington	Casing Materials:	PVC	Well Depth:	14.00	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm)	Start Water Level:	2.46	Ft btoc
Start Date:	December 8, 2022	Weather:	Cloudy , 38 F	Water Column:	11.54	Ft
Sampling Team:	Jordan Peery Lemon, Tim Anderson			Well Diameter:	2	In
Purge Method:	Low Flow			Volume per Foot:	0.163	Gal/ft
Equipment	Peristaltic Pump, YSI, Turbidity Meter, MultiRAE,			Well Volume:	1.88	Gal
				Start Time:	08:20	
				End Time:	08:39	
				Total Volume Purged:	3.5	Gal
Tubing Materials:	HDPE1/4					
				Screened Interval:	5-15	Ft bgs
				Pumping/Tube Intake:	7	Ft btoc

Diam (in.)	Vol. (gal/ft)
1	0.041
1.25	0.064
2	0.163
4	0.653

Notes:
(mL/min) = milliliters per minute
(SU) = Standard Units
(mS/cm) = milliSiemens per centimeter
(mV) = Millivolts
(mg/L) = Milligrams per liter
(NTU) = Nephelometric Turbidity Unit
N/A = Not applicable
NM = Not measured
Ft bgs = Feet below ground surface
Ft btoc = Feet below top of casing

WELL STABILIZATION DATA

Time	Pumping Rate (mL/min)	Water level (ft)	pH (SU)	SP. Cond. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Appearance
08:20	300	2.46	6.85	0.159	12.68	17.90	27.65	25.30	Clear
08:23	300	2.60	6.83	0.160	12.60	32.60	28.85	9.66	Clear
08:30	300	2.57	6.81	0.164	12.62	38.60	33.79	5.19	Clear
08:35	300	2.56	6.81	0.164	12.54	39.10	32.88	4.94	Clear
08:39	300	2.55	6.81	0.165	12.61	41.40	33.29	2.24	Clear

SAMPLE INFORMATION

Sample ID:	NBKK-B1006-MW04-1222	Primary Laboratory:	Battelle
Analyses:	PFAS/LCMSMS Compliant with DoD QSM v5.3 Table B-15	Shipment Method:	FedEx
Collection Date/Time:	12/08/22 07:45	QC Sample:	YES
Sample Comments:	None	QC Sample ID:	NBKK-B1006-MW04P-1222

GROUNDWATER SAMPLING DATA SHEET

Client: NAVFAC
Location: NCK Keyport
Event:
Date: 6/1/2023
Weather: Clear, 70's

Project Number: 9000NVT1.A.PN.EV.03.FI-WS **Page:** 1 of 1
Well ID: NBKK-OU2A2-MW1
Sample ID: NBKK-OU2A2-MW1-0623
Sampling Team: Eric Storkerson

Total Depth: 13.41 FT.(BTOC)
Depth to water: (-) 2.65 FT.(BTOC)
Water Column: 10.76 FT.
(x) 0.163 GAL/FT.
Well Volume: 1.75 GAL.
Total Purge Vol.: 7.5 GAL.

Purge Device: Low-flow with Peristaltic Pump

Measuring Device: Peristaltic Pump, Horiba, MultiRae, Water Level Meter

Well Dia. (inches)	Volume (gallons/foot)
1	0.041
1.25	0.064
2	0.163
4	0.653

PARAMETER STABILIZATION CRITERIA

Parameter	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	DTW ft BTOC	
Criteria	±0.1	±0.01 (if <1) ±0.02 (if >1)	±0.05 (if <1) ±0.2 (if >1)	±0.1	±10	±10 % ≤ 10 NTU	±0.3 (low flow)	

FIELD PARAMETERS

Time	Purge Vol. (gals/min)	Temp. °C	Cond. mS/cm	DO mg/L	pH SU	ORP mV	Turbidity NTU	DTW ft BTOC	Color / Odor / Comments
11:37	0.16	13.27	0.335	0.18	6.46	-71	24.2	3.01	clear
11:42	0.16	12.79	0.330	0.23	6.07	-58	29.0	3.01	clear
11:47	0.16	12.61	0.326	0.27	6.09	-61	21.4	3.01	clear
11:52	0.16	12.55	0.327	0.24	6.13	-65	17.3	3.01	clear
11:57	0.16	12.53	0.325	0.38	6.30	-76	15.7	3.01	clear
12:02	0.16	12.52	0.324	0.43	6.27	-76	14.5	3.01	clear
12:07	0.16	12.44	0.325	0.45	6.25	-86	13.8	3.01	clear
12:12	0.16	12.45	0.324	0.46	6.23	-82	13.2	3.01	clear
Total: 48 min	Total: 7.5 gal			*Appears low. Possible error?					

Sample information: method, container number, size, and type, preservative used.

Analysis	Preservative	Container requirements	No. of containers
PFAS	none	poly bottles	
field blank	none	poly bottles	
equipment blank	none	poly bottles	

Observations/Notes:

Air Monitoring:
VOC (ppm)= 0.0
H2S (ppm)
LEL (%)=
CO (ppm)=
O2 (%)= 21

Pump Start Time: 11:27
Bladder **Initial Fill Time(FT; sec):**
Bladder **Initial Discharge Time(DT; sec):**
Submersible **Initial Control Setting(Hz):**

Final Fill Time:
Final Discharge Time:
Final Control Setting(Hz):

Purge Rate: 0.16 gal/min

Pump Depth: 9 feet below TOC

Sample /Time: 12:15

MS/MSD
Duplicate ID:

Signature(s): Eric Storkerson

JACOBS GROUNDWATER SAMPLING DATA SHEET

WELL ID: NBKK-OU2A2-MW02

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington	Casing Materials:	PVC	Well Depth:	14.00	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm)	Start Water Level:	5.88	Ft btoc
Start Date:	December 8, 2022	Weather:	Cloudy , 40 F	Water Column:	11.12	Ft
Sampling Team:	Jordan Peery Lemon, Tim Anderson			Well Diameter:	2	In
Purge Method:	Low Flow			Volume per Foot:	0.163	Gal/ft
Equipment	Peristaltic Pump, YSI, Turbidity Meter, MultiRAE			Well Volume:	1.81	Gal
				Start Time:	14:12	
				End Time:	14:39	
				Total Volume Purged:	2.1	Gal
Tubing Materials:	HDPE 0.25" OD x 0.170" ID					
				Screened Interval:	4-14	Ft bgs
				Pumping/Tube Intake:	12	Ft btoc

Diam (in.)	Vol. (gal/ft)
1	0.041
1.25	0.064
2	0.163
4	0.653

Notes:
(mL/min) = milliliters per minute
(SU) = Standard Units
(mS/cm) = milliSiemens per centimeter
(mV) = Millivolts
(mg/L) = Milligrams per liter
(NTU) = Nephelometric Turbidity Unit
N/A = Not applicable
NM = Not measured
Ft bgs = Feet below Ground Surface
Ft btoc = Feet below top of casing

WELL STABILIZATION DATA

Time	Pumping Rate (mL/min)	Water level (ft bgs)	pH (SU)	SP. Cond. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Appearance
14:12	300	5.88	6.58	0.133	8.30	40.80	23.56	280.00	Cloudy, Brown
14:17	300	5.85	6.49	0.125	8.13	50.30	17.89	193.00	Cloudy
14:22	300	5.85	6.53	0.136	8.13	50.30	16.09	6.81	Clear
14:27	300	5.86	6.48	0.136	8.14	55.80	16.69	2.32	Clear
14:34	300	5.88	6.48	0.135	8.17	57.20	16.43	2.28	Clear
14:39	300	5.89	6.49	0.135	8.13	56.60	16.70	2.33	Clear

SAMPLE INFORMATION

Sample ID:	NBKK-OU2A2-MW02-1222	Primary Laboratory:	Battelle
Analyses:	PFAS/LCMSMS Compliant with DoD QSM v5.3 Table B-15	Shipment Method:	FedEx
Collection Date/Time:	12/08/22 14:45	QC Sample:	N/A
Sample Comments:	None	QC Sample ID:	N/A

GROUNDWATER SAMPLING DATA SHEET

WELL ID: NBKK-OU2A2-MW03

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington	Casing Materials:	PVC	Well Depth:	14.00	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm)	Start Water Level:	2.25	Ft btoc
Start Date:	December 8, 2022	Weather:	Cloudy , 40 F	Water Column:	11.75	Ft
Sampling Team:	Jordan Peery Lemon, Tim Anderson			Well Diameter:	2	In
Purge Method:	Low Flow			Volume per Foot:	0.163	Gal/ft
Equipment	Peristaltic Pump, YSI, Turbidity Meter, MultiRAE			Well Volume:	1.92	Gal
				Start Time:	13:02	
				End Time:	13:30	
				Total Volume Purged:	3.5	Gal
Tubing Materials:	HDPE 0.25" OD x 0.170" ID					
				Screened Interval:	4-14	Ft bgs
				Pumping/Tube Intake:	8	Ft btoc

Diam (in.)	Vol. (gal/ft)
1	0.041
1.25	0.064
2	0.163
4	0.653

Notes:
(mL/min) = milliliters per minute
(SU) = Standard Units
(mS/cm) = milliSiemens per centimeter
(mV) = Millivolts
(mg/L) = Milligrams per liter
(NTU) = Nephelometric Turbidity Unit
N/A = Not applicable
NM = Not measured
Ft bgs = Feet below Ground Surface
Ft btoc = Feet below top of casing

WELL STABILIZATION DATA

Time	Pumping Rate (mL/min)	Water level (ft bgs)	pH (SU)	SP. Cond. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Appearance
13:02	300	2.25	7.71	0.353	10.55	-81.90	17.69	10.30	Clear
13:07	300	2.84	7.70	0.353	10.25	-81.50	14.39	32.30	Clear
13:11	300	2.86	7.68	0.351	10.04	-82.70	14.08	23.00	Clear
13:16	300	2.90	7.63	0.342	9.97	-83.00	13.66	12.10	Clear
13:21	300	2.85	7.56	0.330	10.00	-81.40	13.27	8.63	Clear
13:28	300	2.88	7.50	0.321	10.06	-80.00	13.31	8.76	Clear

SAMPLE INFORMATION

Sample ID:	NBKK-OU2A2-MW03-1222	Primary Laboratory:	Battelle
Analyses:	PFAS/LCMSMS Compliant with DoD QSM v5.3 Table B-15	Shipment Method:	FedEx
Collection Date/Time:	12/08/22 13:30	QC Sample:	YES
Sample Comments:	None	QC Sample ID:	NBKK-OU2A2-MW03P-1222

JACOBS GROUNDWATER SAMPLING DATA SHEET

WELL ID: NBKK-OU2A2-MW04

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington	Casing Materials:	PVC	Well Depth:	17.00	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm)	Start Water Level:	5.07	Ft btoc
Start Date:	December 8, 2022	Weather:	Cloudy , 40 F	Water Column:	11.93	Ft
Sampling Team:	Jordan Peery Lemon, Tim Anderson			Well Diameter:	2	In
Purge Method:	Low Flow			Volume per Foot:	0.163	Gal/ft
Equipment	Peristaltic Pump, YSI, Turbidity Meter, MultiRAE			Well Volume:	1.95	Gal
				Start Time:	10:11	
				End Time:	10:44	
				Total Volume Purged:	2.4	Gal
Tubing Materials:	HDPE 0.25" OD x 0.170" ID					
				Screened Interval:	7-17	Ft bgs
				Pumping/Tube Intake:	12	Ft btoc

Diam (in.)	Vol. (gal/ft)
1	0.041
1.25	0.064
2	0.163
4	0.653

Notes:
(mL/min) = milliliters per minute
(SU) = Standard Units
(mS/cm) = milliSiemens per centimeter
(mV) = Millivolts
(mg/L) = Milligrams per liter
(NTU) = Nephelometric Turbidity Unit
N/A = Not applicable
NM = Not measured
Ft bgs = Feet below Ground Surface
Ft btoc = Feet below top of casing

WELL STABILIZATION DATA

Time	Pumping Rate (mL/min)	Water level (ft bgs)	pH (SU)	SP. Cond. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Appearance
10:11	300	5.07	7.17	0.259	15.16	107.10	14.38	151.00	Cloudy
10:19	300	5.60	7.17	0.266	15.23	56.50	12.51	28.00	Clear
10:26	300	5.59	7.18	0.270	15.23	44.80	14.17	9.12	Clear
10:32	300	5.59	7.17	0.273	15.28	34.40	13.87	4.41	Clear
10:37	300	5.59	7.18	0.274	15.30	29.50	13.56	4.54	Clear
10:41	300	5.59	7.18	0.276	15.23	28.80	13.09	3.86	Clear

SAMPLE INFORMATION

Sample ID:	NBKK-OU2A2-MW04-1222	Primary Laboratory:	Battelle
Analyses:	PFAS/LCMSMS Compliant with DoD QSM v5.3 Table B-15	Shipment Method:	FedEx
Collection Date/Time:	12/08/22 10:45	QC Sample:	N/A
Sample Comments:	None	QC Sample ID:	N/A

JACOBS GROUNDWATER SAMPLING DATA SHEET

WELL ID: NBKK-OU2A2-MW05

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington	Casing Materials:	PVC	Well Depth:	17.00	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm)	Start Water Level:	5.57	Ft btoc
Start Date:	December 8, 2022	Weather:	Cloudy , 40 F	Water Column:	11.43	Ft
Sampling Team:	Jordan Peery Lemon, Tim Anderson			Well Diameter:	2	In
Purge Method:	Low Flow			Volume per Foot:	0.163	Gal/ft
Equipment:	Peristaltic Pump, YSI, Turbidity Meter, MultiRAE			Well Volume:	1.87	Gal
				Start Time:	12:14	
				End Time:	12:44	
				Total Volume Purged:	3.5	Gal
Tubing Materials:	HDPE 0.25" OD x 0.170" ID					
				Screened Interval:	7-17	Ft bgs
				Pumping/Tube Intake:	12	Ft btoc

Diam (in.)	Vol. (gal/ft)
1	0.041
1.25	0.064
2	0.163
4	0.653

Notes:
(mL/min) = milliliters per minute
(SU) = Standard Units
(mS/cm) = milliSiemens per centimeter
(mV) = Millivolts
(mg/L) = Milligrams per liter
(NTU) = Nephelometric Turbidity Unit
N/A = Not applicable
NM = Not measured
Ft bgs = Feet below Ground Surface
Ft btoc = Feet below top of casing

WELL STABILIZATION DATA

Time	Pumping Rate (mL/min)	Water level (ft bgs)	pH (SU)	SP. Cond. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Appearance
12:14	300	5.57	7.49	0.381	15.00	-48.10	10.40	5.52	Clear
12:22	300	7.69	7.43	0.367	14.38	-42.00	13.49	9.82	Clear
12:28	300	9.57	7.36	0.372	14.87	-31.20	13.74	5.91	Clear
12:34	300	11.13	7.51	0.356	15.32	-74.50	13.05	4.66	Clear
12:38	300	11.88	7.55	0.353	15.29	-78.20	13.65	6.82	Clear
12:42	300	13.01	7.47	0.358	15.24	-59.60	13.64	5.62	Clear

SAMPLE INFORMATION

Sample ID:	NBKK-OU2A2-MW05-1222	Primary Laboratory:	Battelle
Analyses:	PFAS/LCMSMS Compliant with DoD QSM v5.3 Table B-15	Shipment Method:	FedEx
Collection Date/Time:	12/08/22	QC Sample:	N/A

	12:40		
Sample Comments:	None	QC Sample ID:	N/A

GROUNDWATER SAMPLING DATA SHEET

WELL ID: NBKK-OU2A2-MW06

JACOBS

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington	Casing Materials:	PVC	Well Depth:	14.00	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm)	Start Water Level:	6.4	Ft btoc
Start Date:	December 8, 2022	Weather:	Cloudy , 40 F	Water Column:	7.6	Ft
Sampling Team:	Jordan Peery Lemon, Tim Anderson			Well Diameter:	2	In
Purge Method:	Low Flow			Volume per Foot:	0.163	Gal/ft
Equipment	Peristaltic Pump, YSI, Turbidity Meter,			Well Volume:	1.24	Gal
				Start Time:	09:12	
				End Time:	09:45	
				Total Volume Purged:	4.0	Gal
Tubing Materials:	HDPE1/4"					
				Screened Interval:	4-14	Ft bgs
				Pumping/Tube Intake:	7	Ft btoc

Diam (in.)	Vol. (gal/ft)
1	0.041
1.25	0.064
2	0.163
4	0.653

Notes:
(mL/min) = milliliters per minute
(SU) = Standard Units
(mS/cm) = milliSiemens per centimeter
(mV) = Millivolts
(mg/L) = Milligrams per liter
(NTU) = Nephelometric Turbidity Unit
N/A = Not applicable
NM = Not measured
Ft bgs = Feet below ground surface
Ft btoc = Feet below top of casing

WELL STABILIZATION DATA

Time	Pumping Rate (mL/min)	Water level (ft)	pH (SU)	SP. Cond. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Appearance
09:12	300	6.40	6.41	0.130	9.64	148.20	11.11	58.80	Clear
09:18	300	7.65	6.35	0.129	9.63	171.70	25.38	204.00	Cloudy
09:25	300	7.83	6.35	0.131	9.90	180.10	20.64	191.00	Cloudy
09:31	300	7.88	6.35	0.132	10.06	182.30	19.65	115.00	Clear
09:36	300	7.96	6.35	0.135	10.11	183.20	21.53	47.10	Clear
09:42	300	7.99	6.35	0.135	10.16	182.90	20.19	39.40	Clear
09:47	300	8.02	6.35	0.136	10.18	182.40	20.56	41.90	Clear

SAMPLE INFORMATION

Sample ID:	NBKK-OU2A2-MW06-1222	Primary Laboratory:	Battelle
Analyses:	PFAS/LCMSMS Compliant with DoD QSM v5.3 Table B-15	Shipment Method:	
Collection Date/Time:	12/08/22 09:12	QC Sample:	N/A
Sample Comments:	None	QC Sample ID:	N/A

JACOBS GROUNDWATER SAMPLING DATA SHEET

WELL ID: NBKK-OU2A2-MW2-8

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington	Casing Materials:	PVC	Well Depth:	12.00	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm)	Start Water Level:	4.65	Ft btoc
Start Date:	December 8, 2022	Weather:	Cloudy , 40 F	Water Column:	12.35	Ft
Sampling Team:	Jordan Peery Lemon, Tim Anderson			Well Diameter:	4	In
Purge Method:	Low Flow			Volume per Foot:	0.653	Gal/ft
Equipment	Peristaltic Pump, YSI, Turbidity Meter, MultiRAE,			Well Volume:	8.06	Gal
				Start Time:	10:59	
				End Time:	11:27	
				Total Volume Purged:	2.1	Gal
Tubing Materials:	HDPE1/4					
				Screened Interval:	7-12	Ft bgs
				Pumping/Tube Intake:	12	Ft btoc

Diam (in.)	Vol. (gal/ft)
1	0.041
1.25	0.064
2	0.163
4	0.653

Notes:
(mL/min) = milliliters per minute
(SU) = Standard Units
(mS/cm) = milliSiemens per centimeter
(mV) = Millivolts
(mg/L) = Milligrams per liter
(NTU) = Nephelometric Turbidity Unit
N/A = Not applicable
NM = Not measured
Ft bgs = Feet below ground surface
Ft btoc = Feet below top of casing

WELL STABILIZATION DATA

Time	Pumping Rate (mL/min)	Water level (ft)	pH (SU)	SP. Cond. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Appearance
10:59	300	4.65	7.07	0.935	11.89	65.40	8.13	11.70	Clear
11:03	300	5.75	7.08	0.943	11.84	56.00	9.20	10.10	Clear
11:09	300	6.66	7.11	0.952	11.75	41.80	11.97	7.30	Clear
11:14	300	7.12	7.10	0.957	11.67	34.20	11.67	4.38	Clear
11:19	300	7.55	7.12	0.966	11.67	27.20	11.05	5.12	Clear
11:26	300	8.01	7.12	0.974	11.69	25.80	11.43	3.17	Clear

SAMPLE INFORMATION

Sample ID:	NBKK-OU2A2-MW2-8-1222	Primary Laboratory:	Battelle
Analyses:	PFAS/LCMSMS Compliant with DoD QSM v5.3 Table B-15	Shipment Method:	FedEx
Collection Date/Time:	12/08/22 11:30	QC Sample:	N/A
Sample Comments:	None	QC Sample ID:	N/A

JACOBS GROUNDWATER SAMPLING DATA SHEET

WELL ID: NBKK-S7-MW01

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington	Casing Materials:	PVC	Well Depth:	28.90	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm)	Start Water Level:	5.66	Ft btoc
Start Date:	December 2, 2022	Weather:	Cloudy , 35 F	Water Column:	23.24	Ft
Sampling Team:	Aaron Vogt and Joey Velasquez			Well Diameter:	2	In
Purge Method:	Low Flow			Volume per Foot:	0.163	Gal/ft
Equipment	Peristaltic Pump, Geotech, GeoPump, C-103193 Horiba, Horiba, U-5000, 4259F4FD MultiRAE, RAESystems, MultiRAE, C103104			Well Volume:	3.79	Gal
				Start Time:	15:01	
				End Time:	15:28	
				Total Volume Purged:	2.5	Gal
Tubing Materials:	HDPE1/4"					
				Screened Interval:	9-29	Ft bgs
				Pumping/Tube Intake:	25	Ft btoc

Diam (in.)	Vol. (gal/ft)
1	0.041
1.25	0.064
2	0.163
4	0.653

Notes:
(mL/min) = milliliters per minute
(SU) = Standard Units
(mS/cm) = milliSiemens per centimeter
(mV) = Millivolts
(mg/L) = Milligrams per liter
(NTU) = Nephelometric Turbidity Unit
N/A = Not applicable
NM = Not measured
Ft bgs = Feet below ground surface
Ft btoc = Feet below top of casing

WELL STABILIZATION DATA

Time	Pumping Rate (mL/min)	Water level (ft)	pH (SU)	SP. Cond. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Appearance
15:06	350	5.80	7.52	65.900	11.77	186.00	7.80	2.50	Clear
15:11	350	5.84	7.56	65.600	11.83	196.00	6.57	0.00	Clear
15:16	350	5.91	7.57	65.700	11.80	205.00	6.35	0.00	Clear
15:20	350	5.97	7.57	65.700	11.79	211.00	6.09	0.00	Clear
15:23	350	6.01	7.57	65.600	11.82	214.00	6.09	0.00	Clear
15:26	350		7.57	65.600	11.76	217.00	5.91	0.00	Clear

SAMPLE INFORMATION

Sample ID:	NBKK-S7-MW01-1222	Primary Laboratory:	Battelle
Analyses:	PFAS/LCMSMS Compliant with DoD QSM v5.3 Table B-15	Shipment Method:	FedEx
Collection Date/Time:	12/02/22 15:35	QC Sample:	N/A
Sample Comments:	None	QC Sample ID:	N/A

JACOBS GROUNDWATER SAMPLING DATA SHEET

WELL ID: NBKK-S7-MW02

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington	Casing Materials:	PVC	Well Depth:	29.16	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm)	Start Water Level:	11.17	Ft btoc
Start Date:	December 2, 2022	Weather:	Cloudy , 35 F	Water Column:	17.99	Ft
Sampling Team:	Aaron Vogt			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Low Flow			Well Volume:	2.94	Gal
Equipment	Peristaltic Pump, 034906 YSI, Turbidity Meter, 042127 MultiRAE			Start Time:	10:27	
				End Time:	11:15	
				Total Volume Purged:	2.8	Gal
Tubing Materials:	HDPE 0.25" OD x 0.170" ID					
				Screened Interval:	9-29	Ft bgs
				Pumping/Tube Intake:	24	Ft btoc

Diam (in.)	Vol. (gal/ft)
1	0.041
1.25	0.064
2	0.163
4	0.653

Notes:
(mL/min) = milliliters per minute
(SU) = Standard Units
(mS/cm) = milliSiemens per centimeter
(mV) = Millivolts
(mg/L) = Milligrams per liter
(NTU) = Nephelometric Turbidity Unit
N/A = Not applicable
NM = Not measured
Ft bgs = Feet below Ground Surface
Ft btoc = Feet below top of casing

WELL STABILIZATION DATA

Time	Pumping Rate (mL/min)	Water level (ft bgs)	pH (SU)	SP. Cond. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Appearance
10:35	180	10.06	7.63	53.860	11.40	-26.80	5.78	51.10	Clear
10:55	180	9.47	7.72	54.550	10.50	-42.50	5.37	18.40	Clear
11:00	180	9.40	7.73	54.820	11.20	-38.30	5.34	14.70	Clear
11:07	180	9.26	7.73	54.930	11.20	-36.60	5.29	9.88	Clear
11:12	180	9.14	7.75	55.010	11.30	-36.00	5.33	7.52	Clear

SAMPLE INFORMATION

Sample ID:	NBKK-S7-MW02-1222	Primary Laboratory:	Battelle
Analyses:	PFAS/LCMSMS Compliant with DoD QSM v5.3 Table B-15	Shipment Method:	FedEx
Collection Date/Time:	12/02/22 11:15	QC Sample:	YES
Sample Comments:	None	QC Sample ID:	NBKK-S7-MW02-1222-MS/ NBKK-S7-MW02-1222-MSD

GROUNDWATER SAMPLING DATA SHEET

WELL ID: NBKK-S7-MW04

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington	Casing Materials:	PVC	Well Depth:	19.08	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm)	Start Water Level:	9.55	Ft btoc
Start Date:	December 2, 2022	Weather:	Cloudy , 34 F	Water Column:	9.53	Ft
Sampling Team:	Other Aaron Vogt and Joey Velasquez			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Low Flow			Well Volume:	1.56	Gal
Equipment	Peristaltic Pump, Geotech, GeoPump, C103193 Horiba, Horiba, U-5000, 4259F4FD MultiRAE, RAESystems, MultiRAE, C103104			Start Time:	13:24	
				End Time:	14:07	
				Total Volume Purged:	4.5	Gal
Tubing Materials:	HDPE 0.25" OD x 0.170" ID					
				Screened Interval:	9-19	Ft bgs
				Pumping/Tube Intake:	17	Ft btoc

Diam (in.)	Vol. (gal/ft)
1	0.041
1.25	0.064
2	0.163
4	0.653

Notes:
(mL/min) = milliliters per minute
(SU) = Standard Units
(mS/cm) = milliSiemens per centimeter
(mV) = Millivolts
(mg/L) = Milligrams per liter
(NTU) = Nephelometric Turbidity Unit
N/A = Not applicable
NM = Not measured
Ft bgs = Feet below Ground Surface
Ft btoc = Feet below top of casing

WELL STABILIZATION DATA

Time	Pumping Rate (mL/min)	Water level (ft bgs)	pH (SU)	SP. Cond. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Appearance
13:30	350	9.61	7.21	1.920	15.30	57.00	0.00	75.20	Cloudy, mostly clear
13:39	350	9.61	7.24	2.310	15.61	27.00	0.00	38.60	Clear
13:44	350	9.61	7.26	2.370	15.59	19.00	0.00	23.60	Clear
13:52	350	9.61	7.31	2.480	15.47	1.00	0.00	0.00	Clear
13:58	350	9.61	7.33	2.520	15.38	-5.00	0.00	0.00	Clear
14:02	350	9.61	7.34	2.540	15.40	-9.00	0.00	0.00	Clear
14:06	350	9.61	7.36	2.580	15.51	-14.00	0.00	0.00	Clear

SAMPLE INFORMATION

Sample ID:	NBKK-S7-MW04-1222	Primary Laboratory:	Battelle
Analyses:	PFAS/LCMSMS Compliant with DoD QSM v5.3 Table B-15	Shipment Method:	FedEx
Collection Date/Time:	12/02/22 14:10	QC Sample:	N/A

Sample Comments:	None	QC Sample ID:	N/A

JACOBS GROUNDWATER SAMPLING DATA SHEET

WELL ID: NBKK-S7-MW05

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington	Casing Materials:	PVC	Well Depth:	29.00	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm)	Start Water Level:	11.38	Ft btoc
Start Date:	December 2, 2022	Weather:	Cloudy , 36 F	Water Column:	17.62	Ft
Sampling Team:	Aaron Vogt and Joey Velasquez			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Low Flow			Well Volume:	2.88	Gal
Equipment	Peristaltic Pump, Geotech, GeoPump, C-103193 Horiba, Horiba, U-5000, 4259F4FD MultiRAE, RAESystems, MultiRAE, C103104			Start Time:	10:23	
				End Time:	11:35	
				Total Volume Purged:	8.0	Gal
Tubing Materials:	HDPE 0.25" OD x 0.170" ID					

Diam (in.)	Vol. (gal/ft)
1	0.041
1.25	0.064
2	0.163
4	0.653

Notes:
(mL/min) = milliliters per minute
(SU) = Standard Units
(mS/cm) = milliSiemens per centimeter
(mV) = Millivolts
(mg/L) = Milligrams per liter
(NTU) = Nephelometric Turbidity Unit
N/A = Not applicable
NM = Not measured
Ft bgs = Feet below Ground Surface
Ft btoc = Feet below top of casing

Screened Interval:	9-29	Ft bgs	
Pumping/Tube Intake:	25	Ft btoc	

WELL STABILIZATION DATA

Time	Pumping Rate (mL/min)	Water level (ft bgs)	pH (SU)	SP. Cond. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Appearance
10:36	350	10.84	7.19	48.100	11.14	146.00	1.72	237.00	Cloudy, slightly cloudy brown
10:43	325	10.65	7.24	49.100	10.99	134.00	7.77	101.00	Cloudy, slightly cloudy
10:49	325	10.48	7.27	48.800	11.75	130.00	7.98	75.00	Cloudy, mostly clear
10:56	325	10.27	7.29	49.400	11.83	128.00	6.55	65.30	Clear
11:03	325	10.07	7.31	49.500	11.93	128.00	3.19	50.20	Clear
11:10	325	9.88	7.33	49.200	11.90	131.00	2.67	42.50	Clear
11:17	325	9.69	7.34	48.900	11.98	130.00	1.76	42.10	Clear
11:22	325	9.54	7.36	47.900	12.00	128.00	1.26	38.20	Clear
11:27	325	9.39	7.38	46.200	12.08	122.00	0.88	3.20	Clear
11:32	325	9.25	7.40	46.400	12.08	121.00	0.51	1.00	Clear

SAMPLE INFORMATION

Sample ID:	NBKK-S7-MW05-1222	Primary Laboratory:	Battelle

Analyses:	PFAS/LCMSMS Compliant with DoD QSM v5.3 Table B-15	Shipment Method:	FedEx
Collection Date/Time:	12/02/22 11:40	QC Sample:	YES
Sample Comments:	None	QC Sample ID:	NBKK-S7-MW05P-1222

JACOBS GROUNDWATER SAMPLING DATA SHEET

WELL ID: NBKK-LFEX-MW01

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington	Casing Materials:	PVC	Well Depth:	38.03	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm)	Start Water Level:	7.9	Ft btoc
Start Date:	November 10, 2022	Weather:	Partly Cloudy , 37 F	Water Column:	30.13	Ft
Sampling Team:	Tommy Ta, Tim Anderson			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Low Flow			Well Volume:	4.92	Gal
Equipment	Peristaltic Pump, C101699 Horiba, MultiRAE, MultiRae 3540			Start Time:	08:25	
				End Time:	09:20	
				Total Volume Purged:	4.5	Gal
Tubing Materials:	HDPE 0.25" OD x 0.170" ID					
				Screened Interval:	29-39	Ft bgs
				Pumping/Tube Intake:	20	Ft btoc

Diam (in.)	Vol. (gal/ft)
1	0.041
1.25	0.064
2	0.163
4	0.653

Notes:
(mL/min) = milliliters per minute
(SU) = Standard Units
(mS/cm) = milliSiemens per centimeter
(mV) = Millivolts
(mg/L) = Milligrams per liter
(NTU) = Nephelometric Turbidity Unit
N/A = Not applicable
NM = Not measured
Ft bgs = Feet below Ground Surface
Ft btoc = Feet below top of casing

WELL STABILIZATION DATA

Time	Pumping Rate (mL/min)	Water level (ft bgs)	pH (SU)	SP. Cond. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Appearance
08:25	300	7.90	6.52	0.340	13.62	82.00	0.00	159.00	Clear
08:39	300	8.04	7.15	0.304	14.27	-1.00	0.00	207.00	Clear
08:44	300	8.11	7.37	0.293	15.43	-37.00	0.00	171.00	Clear
08:54	300	8.19	7.43	0.289	14.94	-45.00	0.00	152.00	Clear
09:02	300	8.19	7.47	0.300	14.66	-49.00	0.00	179.00	Clear
09:07	300	8.22	7.49	0.305	14.49	-53.00	0.00	168.00	Clear

SAMPLE INFORMATION

Sample ID:	NBKK-LFEX-MW01-1122	Primary Laboratory:	Battelle
Analyses:	PFAS/LCMSMS Compliant with DoD QSM v5.3 Table B-15	Shipment Method:	FedEx
Collection Date/Time:	11/10/22 09:20	QC Sample:	N/A
Sample Comments:	None	QC Sample ID:	N/A

GROUNDWATER SAMPLING DATA SHEET

WELL ID: NBKK-LFEX-MW02

JACOBS

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington	Casing Materials:	PVC	Well Depth:	27.56	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm)	Start Water Level:	8.59	Ft btoc
Start Date:	November 10, 2022	Weather:	Partly Cloudy , 14.59 F	Water Column:	18.97	Ft
Sampling Team:	Tommy Ta, Tim Anderson			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Low Flow			Well Volume:	3.1	Gal
Equipment	Peristaltic Pump, C-103193 Horiba, MultiRAE			Start Time:	11:45	
				End Time:	12:24	
				Total Volume Purged:	3.0	Gal
Tubing Materials:	HDPE 0.25" OD x 0.170" ID					
				Screened Interval:	18-28	Ft bgs
				Pumping/Tube Intake:	20	Ft btoc

Diam (in.)	Vol. (gal/ft)
1	0.041
1.25	0.064
2	0.163
4	0.653

Notes:
(mL/min) = milliliters per minute
(SU) = Standard Units
(mS/cm) = milliSiemens per centimeter
(mV) = Millivolts
(mg/L) = Milligrams per liter
(NTU) = Nephelometric Turbidity Unit
N/A = Not applicable
NM = Not measured
Ft bgs = Feet below Ground Surface
Ft btoc = Feet below top of casing

WELL STABILIZATION DATA

Time	Pumping Rate (mL/min)	Water level (ft bgs)	pH (SU)	SP. Cond. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Appearance
11:45	300	8.63	7.85	0.240	14.53	-9.00	1.21	76.60	Clear
12:00	300	8.82	7.87	0.239	14.23	-32.00	0.00	154.00	Clear
12:06	300	8.65	7.90	0.243	14.02	-45.00	0.00	117.00	Clear
12:10	300	8.66	7.84	0.239	14.48	-18.00	0.00	480.00	Cloudy, Grey
12:15	300	8.66	7.87	0.245	14.08	-40.00	0.00	157.00	Cloudy, Grey
12:19	300	8.67	7.88	0.246	13.96	-49.00	0.00	149.00	Clear
12:23	300	8.68	7.89	0.245	13.93	-44.00	0.00	141.00	Clear

SAMPLE INFORMATION

Sample ID:	NBKK-LFEX-MW02-1122	Primary Laboratory:	Battelle
Analyses:	PFAS/LCMSMS Compliant with DoD QSM v5.3 Table B-15	Shipment Method:	FedEx
Collection Date/Time:	11/10/22 12:25	QC Sample:	N/A
Sample Comments:	None	QC Sample ID:	N/A

JACOBS GROUNDWATER SAMPLING DATA SHEET

WELL ID: NBKK-LFEX-MW03

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington	Casing Materials:	PVC	Well Depth:	29.26	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm)	Start Water Level:	5.35	Ft btoc
Start Date:	November 10, 2022	Weather:	Partly Cloudy , 17.14 F	Water Column:	23.91	Ft
Sampling Team:	Tommy Ta, Tim Anderson			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Low Flow			Well Volume:	3.9	Gal
Equipment	Peristaltic Pump, C101699 Horiba, MultiRAE			Start Time:	10:20	
				End Time:	11:15	
				Total Volume Purged:	2.4	Gal
Tubing Materials:	HDPE 0.25" OD x 0.170" ID					
				Screened Interval:	19.5-29.5	Ft bgs
				Pumping/Tube Intake:	15	Ft btoc

Diam (in.)	Vol. (gal/ft)
1	0.041
1.25	0.064
2	0.163
4	0.653

Notes:
(mL/min) = milliliters per minute
(SU) = Standard Units
(mS/cm) = milliSiemens per centimeter
(mV) = Millivolts
(mg/L) = Milligrams per liter
(NTU) = Nephelometric Turbidity Unit
N/A = Not applicable
NM = Not measured
Ft bgs = Feet below Ground Surface
Ft btoc = Feet below top of casing

WELL STABILIZATION DATA

Time	Pumping Rate (mL/min)	Water level (ft)	pH (SU)	SP. Cond. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Appearance
10:20	300	5.86	7.55	0.311	17.45	-15.00	0.44	74.70	Clear
10:38	300	6.02	7.59	0.307	16.92	-36.00	0.00	126.00	Clear
10:38	300	6.22	7.59	0.313	16.44	-44.00	0.00	149.00	Clear
10:46	300	6.41	7.59	0.310	16.53	-35.00	0.00	150.00	Clear
10:54	300	6.52	7.61	0.309	16.39	-45.00	0.00	75.80	Clear
11:04	300	6.55	7.62	0.306	16.31	-51.00	0.00	30.50	Clear
11:06	300	6.53	7.62	0.305	16.28	-53.00	0.00	28.50	Clear
11:10	300	6.50	7.62	0.305	16.22	-54.00	0.00	27.40	Clear

SAMPLE INFORMATION

Sample ID:	NBKK-LFEX-MW03-1122	Primary Laboratory:	Battelle
Analyses:	PFAS/LCMSMS Compliant with DoD QSM v5.3 Table B-15	Shipment Method:	FedEx
Collection Date/Time:	11/10/22 11:30	QC Sample:	N/A

Sample Comments: None	QC Sample ID: N/A

JACOBS GROUNDWATER SAMPLING DATA SHEET

WELL ID: NBKK-LFEX-MW04

Project Name:	Site Inspection for PFAS, Naval Base Kitsap Keyport, Keyport, Washington	Casing Materials:	PVC	Well Depth:	33.42	Ft btoc
Project Number:	704758CH.05.06.FI	Well Head PID Reading:	**VOC:** 0 (ppm)	Start Water Level:	9.46	Ft btoc
Start Date:	November 10, 2022	Weather:	Partly Cloudy , 37 F	Water Column:	23.96	Ft
Sampling Team:	Tommy Ta, Tim Anderson			Well Diameter:	2	In
				Volume per Foot:	0.163	Gal/ft
Purge Method:	Low Flow			Well Volume:	3.91	Gal
Equipment	Peristaltic Pump, Horiba, MultiRAE,			Start Time:	09:28	
				End Time:	10:04	
				Total Volume Purged:	3.8	Gal
Tubing Materials:	HDPE1/4			Screened Interval:	23-33	Ft-bgs
				Pumping/Tube Intake:	20	Ft btoc

Diam (in.)	Vol. (gal/ft)
1	0.041
1.25	0.064
2	0.163
4	0.653

Notes:
(mL/min) = milliliters per minute
(SU) = Standard Units
(mS/cm) = milliSiemens per centimeter
(mV) = Millivolts
(mg/L) = Milligrams per liter
(NTU) = Nephelometric Turbidity Unit
N/A = Not applicable
NM = Not measured
Ft bgs = Feet below ground surface
Feet btoc = Feet below top of casing

WELL STABILIZATION DATA

Time	Pumping Rate (mL/min)	Water level (ft)	pH (SU)	SP. Cond. (mS/cm)	Temp. (°C)	ORP (mV)	D.O. (mg/L)	Turbidity (NTU)	Appearance
09:28	300	9.46	7.16	0.506	14.44	22.00	1.80	12.50	Clear
09:39									
09:43	300	9.79	7.14	0.530	14.56	10.00	0.00	14.30	Clear
09:50	300	9.74	7.15	0.534	14.50	0.00	0.00	18.00	Clear
09:51	300	9.77	7.16	0.533	14.44	1.00	0.00	6.50	Clear
10:02	300	9.80	7.16	0.532	14.49	-4.00	0.00	4.20	Clear

SAMPLE INFORMATION

Sample ID:	NBKK-LFEX-MW04-1122	Primary Laboratory:	Battelle
Analyses:	PFAS/LCMSMS Compliant with DoD QSM v5.3 Table B-15	Shipment Method:	FedEx
Collection Date/Time:	11/10/22 10:05	QC Sample:	N/A
Sample Comments:	None	QC Sample ID:	N/A

Appendix F
Groundwater Tidal Influence Transducer Data

Table F-1. Groundwater Elevations - January and August 2023

Site Inspection Report for Per- and Polyfluoroalkyl Substances at Naval Base Kitsap-Keyport

Keyport, Washington

Monitoring Well	Date Measured	Ground Surface Elevation (ft amsl)	Top of Casing Elevation (ft amsl)	Depth to Water (ft bgs)	Groundwater Elevation (ft amsl)
NBKK-B76-MW01	8/16/2023	44.60	44.35	10.88	33.47
NBKK-B76-MW02	8/16/2023	43.45	43.16	12.74	30.42
NBKK-B76-MW03	8/16/2023	45.45	45.15	7.54	37.61
NBKK-B76-MW04	8/16/2023	53.11	52.87	22.54	30.33
NBKK-B76-MW06	8/16/2023	43.26	42.99	11.15	31.84
NBKK-B76-MW07	8/16/2023	50.15	49.92	15.51	34.41
NBKK-B76-MW08	8/16/2023	54.71	54.37	20.40	33.97
NBKK-B76-MW09	8/16/2023	54.84	54.59	16.52	38.07
NBKK-CF1-MW01	1/27/2023	34.91	34.90	21.85	13.05
NBKK-CF1-MW02	1/27/2023	43.12	42.80	25.34	17.46
NBKK-CF1-MW03	1/27/2023	36.81	36.50	19.82	16.68
NBKK-OU2A5-MW01	1/27/2023	21.70	21.44	13.55	7.89
NBKK-OU2A5-MW02	1/27/2023	18.50	18.06	10.84	7.22
NBKK-OU2A5-MW03	1/27/2023	26.17	25.68	11.49	14.19
NBKK-B1006-MW01	1/27/2023	13.82	13.38	0.89	12.49
NBKK-B1006-MW02	1/27/2023	12.65	12.34	0	12.34
NBKK-B1006-MW03	1/27/2023	18.14	17.87	6.52	11.35
NBKK-B1006-MW04	1/27/2023	15.75	15.22	2.49	12.73
NBKK-OU2A2-MW01	1/27/2023	28.39	28.15	1.82	26.33
NBKK-OU2A2-MW02	1/27/2023	25.42	27.26	6.57	20.69
NBKK-OU2A2-MW03	2/1/2023	23.60	23.18	2.15	21.03
NBKK-OU2A2-MW04[a]	1/27/2023	23.98	23.66	NA	
NBKK-OU2A2-MW05[a]	1/27/2023	24.90	24.53	NA	
NBKK-OU2A2-MW06	1/27/2023	20.93	23.21	6.15	17.06
NBKK-OU2A2-2MW-1[a]	NA				
NBKK-OU2A2-MW2-2[a]	NA				
NBKK-OU2A2-MW2-8[a]	NA				

Table F-1. Groundwater Elevations - January and August 2023

Site Inspection Report for Per- and Polyfluoroalkyl Substances at Naval Base Kitsap-Keyport

Keyport, Washington

Monitoring Well	Date Measured	Ground Surface Elevation (ft amsl)	Top of Casing Elevation (ft amsl)	Depth to Water (ft bgs)	Groundwater Elevation (ft amsl)
NBKK-S7-MW01	1/27/2023	13.69	13.33	8.39	4.94
NBKK-S7-MW02	1/27/2023	15.54	15.39	10.88	4.51
NBKK-S7-MW03[b]	NA				
NBKK-S7-MW04	1/27/2023	16.08	15.88	9.29	6.59
NBKK-S7-MW05	1/27/2023	15.68	15.31	9.88	5.43
NBKK-LFEX-MW01	1/27/2023	24.55	24.10	6.25	17.85
NBKK-LFEX-MW02	1/27/2023	21.98	21.60	6.47	15.13
NBKK-LFEX-MW03	1/27/2023	20.13	19.73	3.48	16.25
NBKK-LFEX-MW04	1/27/2023	23.27	23.02	7.08	15.94

[a] Well not found or was inaccessible during synoptic water level survey

[b] Monitoring well NBKK-S7-MW03 was not installed due to access issues and other construction work occurring for the duration of the SI. Removal of this well from the SI scope is described in Field Change Request 1.

amsl = above mean sea level. Vertical elevation references the North American Vertical Datum of 1988

bgs = below ground surface

btoc = below top of casing

ft = feet

NA = not applicable

NBKK-CF-MW01

Date/Time	Average Hourly Pressure (psi) (692870)	Average Hourly Temperature (°C) (692870)	Average Hourly Depth To Water (ft) (692870)	Average Hourly Groundwater Elevation (feet NAVD88)
1/1/23 0:00	12.82	14.53	19.31	15.59
1/1/23 1:00	12.72	14.54	19.53	15.37
1/1/23 2:00	12.61	14.53	19.79	15.11
1/1/23 3:00	12.53	14.53	19.98	14.92
1/1/23 4:00	12.49	14.53	20.07	14.83
1/1/23 5:00	12.48	14.53	20.09	14.81
1/1/23 6:00	12.50	14.53	20.05	14.85
1/1/23 7:00	12.53	14.53	19.97	14.93
1/1/23 8:00	12.56	14.53	19.90	15.00
1/1/23 9:00	12.59	14.53	19.84	15.06
1/1/23 10:00	12.60	14.53	19.82	15.08
1/1/23 11:00	12.59	14.53	19.84	15.06
1/1/23 12:00	12.58	14.53	19.87	15.03
1/1/23 13:00	12.57	14.53	19.87	15.03
1/1/23 14:00	12.59	14.53	19.84	15.06
1/1/23 15:00	12.62	14.53	19.76	15.14
1/1/23 16:00	12.68	14.53	19.62	15.28
1/1/23 17:00	12.76	14.52	19.43	15.47
1/1/23 18:00	12.86	14.52	19.22	15.68
1/1/23 19:00	12.95	14.53	19.01	15.89
1/1/23 20:00	13.02	14.53	18.85	16.05
1/1/23 21:00	13.04	14.53	18.79	16.11
1/1/23 22:00	13.01	14.53	18.86	16.04
1/1/23 23:00	12.93	14.53	19.06	15.84
1/2/23 0:00	12.80	14.53	19.36	15.54
1/2/23 1:00	12.65	14.53	19.71	15.19
1/2/23 2:00	12.50	14.53	20.04	14.86
1/2/23 3:00	12.38	14.53	20.32	14.58
1/2/23 4:00	12.30	14.53	20.50	14.40
1/2/23 5:00	12.27	14.53	20.57	14.33
1/2/23 6:00	12.28	14.53	20.55	14.35
1/2/23 7:00	12.32	14.53	20.46	14.44
1/2/23 8:00	12.38	14.53	20.32	14.58
1/2/23 9:00	12.45	14.53	20.17	14.73
1/2/23 10:00	12.51	14.53	20.03	14.87
1/2/23 11:00	12.55	14.53	19.93	14.97
1/2/23 12:00	12.58	14.53	19.87	15.03
1/2/23 13:00	12.60	14.53	19.82	15.08
1/2/23 14:00	12.62	14.52	19.76	15.14
1/2/23 15:00	12.65	14.53	19.69	15.21
1/2/23 16:00	12.70	14.53	19.58	15.32
1/2/23 17:00	12.77	14.53	19.43	15.47
1/2/23 18:00	12.85	14.53	19.24	15.66
1/2/23 19:00	12.94	14.52	19.04	15.86
1/2/23 20:00	13.02	14.53	18.85	16.05
1/2/23 21:00	13.08	14.53	18.72	16.18
1/2/23 22:00	13.09	14.53	18.69	16.21

Date/Time	Average Hourly Pressure (psi) (692870)	Average Hourly Temperature (°C) (692870)	Average Hourly Depth To Water (ft) (692870)	Average Hourly Groundwater Elevation (feet NAVD88)
1/2/23 23:00	13.04	14.53	18.80	16.10
1/3/23 0:00	12.93	14.53	19.05	15.85
1/3/23 1:00	12.78	14.53	19.40	15.50
1/3/23 2:00	12.62	14.53	19.77	15.13
1/3/23 3:00	12.46	14.53	20.13	14.77
1/3/23 4:00	12.34	14.53	20.41	14.49
1/3/23 5:00	12.27	14.53	20.58	14.32
1/3/23 6:00	12.25	14.53	20.62	14.28
1/3/23 7:00	12.27	14.53	20.57	14.33
1/3/23 8:00	12.33	14.53	20.43	14.47
1/3/23 9:00	12.41	14.53	20.25	14.65
1/3/23 10:00	12.50	14.53	20.05	14.85
1/3/23 11:00	12.57	14.53	19.88	15.02
1/3/23 12:00	12.63	14.53	19.75	15.15
1/3/23 13:00	12.66	14.53	19.66	15.24
1/3/23 14:00	12.69	14.52	19.61	15.29
1/3/23 15:00	12.71	14.53	19.56	15.34
1/3/23 16:00	12.74	14.53	19.50	15.40
1/3/23 17:00	12.78	14.53	19.40	15.50
1/3/23 18:00	12.83	14.52	19.27	15.63
1/3/23 19:00	12.90	14.53	19.12	15.78
1/3/23 20:00	12.97	14.53	18.96	15.94
1/3/23 21:00	13.03	14.53	18.82	16.08
1/3/23 22:00	13.06	14.53	18.74	16.16
1/3/23 23:00	13.05	14.53	18.78	16.12
1/4/23 0:00	12.96	14.53	18.98	15.92
1/4/23 1:00	12.82	14.53	19.30	15.60
1/4/23 2:00	12.65	14.53	19.70	15.20
1/4/23 3:00	12.47	14.53	20.11	14.79
1/4/23 4:00	12.32	14.53	20.47	14.43
1/4/23 5:00	12.20	14.53	20.73	14.17
1/4/23 6:00	12.15	14.53	20.86	14.04
1/4/23 7:00	12.15	14.53	20.86	14.04
1/4/23 8:00	12.19	14.53	20.76	14.14
1/4/23 9:00	12.27	14.53	20.58	14.32
1/4/23 10:00	12.36	14.53	20.37	14.53
1/4/23 11:00	12.46	14.53	20.14	14.76
1/4/23 12:00	12.54	14.53	19.95	14.95
1/4/23 13:00	12.61	14.53	19.80	15.10
1/4/23 14:00	12.65	14.53	19.70	15.20
1/4/23 15:00	12.68	14.53	19.63	15.27
1/4/23 16:00	12.71	14.53	19.56	15.34
1/4/23 17:00	12.74	14.53	19.48	15.42
1/4/23 18:00	12.79	14.53	19.37	15.53
1/4/23 19:00	12.85	14.53	19.23	15.67
1/4/23 20:00	12.92	14.53	19.07	15.83
1/4/23 21:00	13.00	14.53	18.90	16.00
1/4/23 22:00	13.05	14.53	18.76	16.14

Date/Time	Average Hourly Pressure (psi) (692870)	Average Hourly Temperature (°C) (692870)	Average Hourly Depth To Water (ft) (692870)	Average Hourly Groundwater Elevation (feet NAVD88)
1/4/23 23:00	13.07	14.53	18.72	16.18
1/5/23 0:00	13.04	14.53	18.81	16.09
1/5/23 1:00	12.93	14.53	19.05	15.85
1/5/23 2:00	12.78	14.53	19.41	15.49
1/5/23 3:00	12.60	14.53	19.82	15.08
1/5/23 4:00	12.42	14.53	20.23	14.67
1/5/23 5:00	12.28	14.53	20.55	14.35
1/5/23 6:00	12.19	14.53	20.75	14.15
1/5/23 7:00	12.16	14.53	20.82	14.08
1/5/23 8:00	12.19	14.53	20.76	14.14
1/5/23 9:00	12.26	14.53	20.59	14.31
1/5/23 10:00	12.36	14.53	20.36	14.54
1/5/23 11:00	12.48	14.53	20.10	14.80
1/5/23 12:00	12.58	14.53	19.85	15.05
1/5/23 13:00	12.67	14.53	19.65	15.25
1/5/23 14:00	12.73	14.53	19.51	15.39
1/5/23 15:00	12.77	14.53	19.41	15.49
1/5/23 16:00	12.81	14.53	19.34	15.56
1/5/23 17:00	12.83	14.53	19.27	15.63
1/5/23 18:00	12.87	14.53	19.19	15.71
1/5/23 19:00	12.92	14.53	19.08	15.82
1/5/23 20:00	12.98	14.53	18.93	15.97
1/5/23 21:00	13.05	14.53	18.78	16.12
1/5/23 22:00	13.11	14.53	18.63	16.27
1/5/23 23:00	13.16	14.53	18.52	16.38
1/6/23 0:00	13.16	14.53	18.53	16.37
1/6/23 1:00	13.09	14.53	18.68	16.22
1/6/23 2:00	12.96	14.53	18.98	15.92
1/6/23 3:00	12.79	14.53	19.38	15.52
1/6/23 4:00	12.61	14.54	19.80	15.10
1/6/23 5:00	12.44	14.54	20.19	14.71
1/6/23 6:00	12.31	14.53	20.49	14.41
1/6/23 7:00	12.23	14.53	20.66	14.24
1/6/23 8:00	12.22	14.53	20.70	14.20
1/6/23 9:00	12.26	14.53	20.61	14.29
1/6/23 10:00	12.33	14.53	20.43	14.47
1/6/23 11:00	12.43	14.53	20.21	14.69
1/6/23 12:00	12.53	14.53	19.97	14.93
1/6/23 13:00	12.62	14.53	19.76	15.14
1/6/23 14:00	12.69	14.53	19.60	15.30
1/6/23 15:00	12.73	14.53	19.51	15.39
1/6/23 16:00	12.76	14.53	19.45	15.45
1/6/23 17:00	12.77	14.53	19.41	15.49
1/6/23 18:00	12.79	14.53	19.36	15.54
1/6/23 19:00	12.83	14.53	19.28	15.62
1/6/23 20:00	12.88	14.53	19.16	15.74
1/6/23 21:00	12.95	14.53	18.99	15.91
1/6/23 22:00	13.03	14.53	18.83	16.07

Date/Time	Average Hourly Pressure (psi) (692870)	Average Hourly Temperature (°C) (692870)	Average Hourly Depth To Water (ft) (692870)	Average Hourly Groundwater Elevation (feet NAVD88)
1/6/23 23:00	13.09	14.53	18.68	16.22
1/7/23 0:00	13.13	14.53	18.59	16.31
1/7/23 1:00	13.11	14.53	18.63	16.27
1/7/23 2:00	13.02	14.53	18.84	16.06
1/7/23 3:00	12.88	14.53	19.17	15.73
1/7/23 4:00	12.70	14.54	19.58	15.32
1/7/23 5:00	12.52	14.53	20.00	14.90
1/7/23 6:00	12.37	14.53	20.35	14.55
1/7/23 7:00	12.26	14.53	20.59	14.31
1/7/23 8:00	12.22	14.53	20.70	14.20
1/7/23 9:00	12.23	14.53	20.67	14.23
1/7/23 10:00	12.29	14.53	20.53	14.37
1/7/23 11:00	12.39	14.53	20.31	14.59
1/7/23 12:00	12.50	14.53	20.05	14.85
1/7/23 13:00	12.61	14.53	19.79	15.11
1/7/23 14:00	12.70	14.53	19.57	15.33
1/7/23 15:00	12.77	14.53	19.42	15.48
1/7/23 16:00	12.82	14.53	19.32	15.58
1/7/23 17:00	12.84	14.53	19.25	15.65
1/7/23 18:00	12.87	14.53	19.19	15.71
1/7/23 19:00	12.90	14.53	19.12	15.78
1/7/23 20:00	12.94	14.53	19.02	15.88
1/7/23 21:00	13.00	14.53	18.89	16.01
1/7/23 22:00	13.07	14.53	18.73	16.17
1/7/23 23:00	13.14	14.53	18.57	16.33
1/8/23 0:00	13.18	14.53	18.47	16.43

NBKK-CF-MW02

Date/Time	Average Hourly Pressure (psi) (836293)	Average Hourly Temperature (°C) (836293)	Average Hourly Depth To Water (ft) (836293)	Average Hourly Groundwater Elevation (feet NAVD88)
1/1/23 0:00	15.30	15.68	24.55	18.25
1/1/23 1:00	15.23	15.68	24.71	18.09
1/1/23 2:00	15.14	15.68	24.90	17.90
1/1/23 3:00	15.08	15.68	25.04	17.76
1/1/23 4:00	15.05	15.68	25.12	17.68
1/1/23 5:00	15.04	15.68	25.14	17.66
1/1/23 6:00	15.05	15.68	25.12	17.68
1/1/23 7:00	15.07	15.68	25.08	17.72
1/1/23 8:00	15.09	15.68	25.03	17.77
1/1/23 9:00	15.10	15.68	25.00	17.80
1/1/23 10:00	15.10	15.68	25.00	17.80
1/1/23 11:00	15.09	15.68	25.03	17.77
1/1/23 12:00	15.07	15.68	25.06	17.74
1/1/23 13:00	15.06	15.68	25.08	17.72
1/1/23 14:00	15.07	15.68	25.08	17.72
1/1/23 15:00	15.09	15.68	25.03	17.77
1/1/23 16:00	15.13	15.68	24.93	17.87
1/1/23 17:00	15.19	15.68	24.79	18.01
1/1/23 18:00	15.26	15.68	24.62	18.18
1/1/23 19:00	15.34	15.68	24.45	18.35
1/1/23 20:00	15.40	15.68	24.30	18.50
1/1/23 21:00	15.44	15.68	24.22	18.58
1/1/23 22:00	15.43	15.68	24.25	18.55
1/1/23 23:00	15.37	15.68	24.37	18.43
1/2/23 0:00	15.29	15.68	24.57	18.23
1/2/23 1:00	15.19	15.69	24.80	18.00
1/2/23 2:00	15.08	15.68	25.05	17.75
1/2/23 3:00	14.99	15.68	25.25	17.55
1/2/23 4:00	14.93	15.69	25.39	17.41
1/2/23 5:00	14.90	15.68	25.46	17.34
1/2/23 6:00	14.90	15.68	25.47	17.33
1/2/23 7:00	14.92	15.68	25.42	17.38
1/2/23 8:00	14.95	15.68	25.34	17.46
1/2/23 9:00	15.00	15.68	25.24	17.56
1/2/23 10:00	15.03	15.68	25.15	17.65
1/2/23 11:00	15.06	15.68	25.09	17.71
1/2/23 12:00	15.07	15.68	25.06	17.74
1/2/23 13:00	15.09	15.68	25.04	17.76
1/2/23 14:00	15.10	15.68	25.01	17.79
1/2/23 15:00	15.11	15.68	24.97	17.83
1/2/23 16:00	15.15	15.68	24.89	17.91
1/2/23 17:00	15.20	15.68	24.77	18.03
1/2/23 18:00	15.26	15.68	24.63	18.17
1/2/23 19:00	15.33	15.68	24.46	18.34
1/2/23 20:00	15.41	15.68	24.29	18.51
1/2/23 21:00	15.46	15.68	24.17	18.63
1/2/23 22:00	15.49	15.68	24.11	18.69

Date/Time	Average Hourly Pressure (psi) (836293)	Average Hourly Temperature (°C) (836293)	Average Hourly Depth To Water (ft) (836293)	Average Hourly Groundwater Elevation (feet NAVD88)
1/2/23 23:00	15.46	15.68	24.17	18.63
1/3/23 0:00	15.39	15.68	24.33	18.47
1/3/23 1:00	15.29	15.69	24.56	18.24
1/3/23 2:00	15.18	15.68	24.82	17.98
1/3/23 3:00	15.06	15.68	25.08	17.72
1/3/23 4:00	14.97	15.68	25.30	17.50
1/3/23 5:00	14.91	15.68	25.45	17.35
1/3/23 6:00	14.88	15.68	25.51	17.29
1/3/23 7:00	14.89	15.68	25.49	17.31
1/3/23 8:00	14.92	15.68	25.42	17.38
1/3/23 9:00	14.97	15.68	25.31	17.49
1/3/23 10:00	15.02	15.68	25.18	17.62
1/3/23 11:00	15.07	15.68	25.07	17.73
1/3/23 12:00	15.10	15.68	24.99	17.81
1/3/23 13:00	15.12	15.68	24.95	17.85
1/3/23 14:00	15.14	15.68	24.92	17.88
1/3/23 15:00	15.15	15.68	24.89	17.91
1/3/23 16:00	15.17	15.68	24.85	17.95
1/3/23 17:00	15.20	15.68	24.77	18.03
1/3/23 18:00	15.24	15.68	24.67	18.13
1/3/23 19:00	15.30	15.68	24.54	18.26
1/3/23 20:00	15.36	15.68	24.40	18.40
1/3/23 21:00	15.42	15.68	24.26	18.54
1/3/23 22:00	15.46	15.68	24.17	18.63
1/3/23 23:00	15.46	15.68	24.17	18.63
1/4/23 0:00	15.41	15.69	24.29	18.51
1/4/23 1:00	15.32	15.68	24.50	18.30
1/4/23 2:00	15.20	15.69	24.78	18.02
1/4/23 3:00	15.07	15.68	25.07	17.73
1/4/23 4:00	14.95	15.69	25.35	17.45
1/4/23 5:00	14.86	15.68	25.56	17.24
1/4/23 6:00	14.81	15.68	25.68	17.12
1/4/23 7:00	14.79	15.68	25.72	17.08
1/4/23 8:00	14.81	15.68	25.67	17.13
1/4/23 9:00	14.85	15.68	25.57	17.23
1/4/23 10:00	14.91	15.68	25.43	17.37
1/4/23 11:00	14.98	15.68	25.29	17.51
1/4/23 12:00	15.03	15.68	25.15	17.65
1/4/23 13:00	15.07	15.68	25.06	17.74
1/4/23 14:00	15.10	15.68	25.00	17.80
1/4/23 15:00	15.12	15.68	24.95	17.85
1/4/23 16:00	15.14	15.68	24.91	17.89
1/4/23 17:00	15.16	15.68	24.85	17.95
1/4/23 18:00	15.20	15.68	24.77	18.03
1/4/23 19:00	15.25	15.68	24.65	18.15
1/4/23 20:00	15.31	15.68	24.51	18.29
1/4/23 21:00	15.38	15.68	24.35	18.45
1/4/23 22:00	15.44	15.68	24.22	18.58

Date/Time	Average Hourly Pressure (psi) (836293)	Average Hourly Temperature (°C) (836293)	Average Hourly Depth To Water (ft) (836293)	Average Hourly Groundwater Elevation (feet NAVD88)
1/4/23 23:00	15.47	15.68	24.14	18.66
1/5/23 0:00	15.46	15.68	24.17	18.63
1/5/23 1:00	15.39	15.68	24.32	18.48
1/5/23 2:00	15.29	15.69	24.56	18.24
1/5/23 3:00	15.16	15.69	24.85	17.95
1/5/23 4:00	15.04	15.69	25.15	17.65
1/5/23 5:00	14.93	15.69	25.40	17.40
1/5/23 6:00	14.85	15.68	25.57	17.23
1/5/23 7:00	14.82	15.68	25.66	17.14
1/5/23 8:00	14.82	15.68	25.64	17.16
1/5/23 9:00	14.86	15.68	25.55	17.25
1/5/23 10:00	14.92	15.68	25.41	17.39
1/5/23 11:00	15.00	15.68	25.24	17.56
1/5/23 12:00	15.07	15.68	25.07	17.73
1/5/23 13:00	15.13	15.68	24.93	17.87
1/5/23 14:00	15.17	15.68	24.84	17.96
1/5/23 15:00	15.20	15.68	24.78	18.02
1/5/23 16:00	15.22	15.68	24.73	18.07
1/5/23 17:00	15.24	15.68	24.68	18.12
1/5/23 18:00	15.26	15.68	24.62	18.18
1/5/23 19:00	15.30	15.68	24.53	18.27
1/5/23 20:00	15.36	15.68	24.41	18.39
1/5/23 21:00	15.42	15.67	24.27	18.53
1/5/23 22:00	15.48	15.68	24.13	18.67
1/5/23 23:00	15.52	15.68	24.02	18.78
1/6/23 0:00	15.54	15.68	23.99	18.81
1/6/23 1:00	15.50	15.68	24.08	18.72
1/6/23 2:00	15.41	15.68	24.27	18.53
1/6/23 3:00	15.30	15.68	24.54	18.26
1/6/23 4:00	15.17	15.69	24.84	17.96
1/6/23 5:00	15.04	15.68	25.14	17.66
1/6/23 6:00	14.94	15.68	25.38	17.42
1/6/23 7:00	14.87	15.68	25.53	17.27
1/6/23 8:00	14.84	15.68	25.59	17.21
1/6/23 9:00	14.86	15.68	25.56	17.24
1/6/23 10:00	14.90	15.68	25.46	17.34
1/6/23 11:00	14.96	15.68	25.32	17.48
1/6/23 12:00	15.03	15.68	25.16	17.64
1/6/23 13:00	15.09	15.68	25.02	17.78
1/6/23 14:00	15.14	15.68	24.92	17.88
1/6/23 15:00	15.16	15.68	24.86	17.94
1/6/23 16:00	15.18	15.68	24.83	17.97
1/6/23 17:00	15.19	15.68	24.80	18.00
1/6/23 18:00	15.20	15.68	24.77	18.03
1/6/23 19:00	15.23	15.68	24.70	18.10
1/6/23 20:00	15.27	15.68	24.60	18.20
1/6/23 21:00	15.33	15.68	24.46	18.34
1/6/23 22:00	15.40	15.68	24.31	18.49

Date/Time	Average Hourly Pressure (psi) (836293)	Average Hourly Temperature (°C) (836293)	Average Hourly Depth To Water (ft) (836293)	Average Hourly Groundwater Elevation (feet NAVD88)
1/6/23 23:00	15.46	15.68	24.17	18.63
1/7/23 0:00	15.50	15.67	24.08	18.72
1/7/23 1:00	15.50	15.68	24.07	18.73
1/7/23 2:00	15.45	15.68	24.19	18.61
1/7/23 3:00	15.35	15.68	24.41	18.39
1/7/23 4:00	15.23	15.68	24.69	18.11
1/7/23 5:00	15.10	15.68	24.99	17.81
1/7/23 6:00	14.99	15.69	25.26	17.54
1/7/23 7:00	14.90	15.68	25.46	17.34
1/7/23 8:00	14.85	15.68	25.57	17.23
1/7/23 9:00	14.85	15.68	25.58	17.22
1/7/23 10:00	14.88	15.68	25.51	17.29
1/7/23 11:00	14.94	15.68	25.37	17.43
1/7/23 12:00	15.01	15.68	25.20	17.60
1/7/23 13:00	15.09	15.68	25.02	17.78
1/7/23 14:00	15.15	15.68	24.87	17.93
1/7/23 15:00	15.20	15.68	24.77	18.03
1/7/23 16:00	15.23	15.68	24.70	18.10
1/7/23 17:00	15.25	15.68	24.65	18.15
1/7/23 18:00	15.27	15.68	24.61	18.19
1/7/23 19:00	15.29	15.68	24.56	18.24
1/7/23 20:00	15.33	15.68	24.48	18.32
1/7/23 21:00	15.38	15.68	24.36	18.44
1/7/23 22:00	15.44	15.68	24.22	18.58
1/7/23 23:00	15.50	15.68	24.07	18.73
1/8/23 0:00	15.55	15.68	23.97	18.83

NBKK-CF-MW02

Date/Time	Average Hourly Pressure (psi) (694389)	Average Hourly Temperature (°C) (694389)	Average Hourly Depth To Water (ft) (694389)	Average Hourly Groundwater Elevation (feet NAVD88)
1/1/23 0:00	12.84	14.60	18.86	17.64
1/1/23 1:00	12.77	14.60	19.01	17.49
1/1/23 2:00	12.70	14.60	19.18	17.32
1/1/23 3:00	12.65	14.60	19.30	17.20
1/1/23 4:00	12.62	14.60	19.36	17.14
1/1/23 5:00	12.61	14.60	19.38	17.12
1/1/23 6:00	12.62	14.60	19.36	17.14
1/1/23 7:00	12.63	14.60	19.33	17.17
1/1/23 8:00	12.65	14.60	19.29	17.21
1/1/23 9:00	12.66	14.60	19.27	17.23
1/1/23 10:00	12.65	14.60	19.28	17.22
1/1/23 11:00	12.64	14.60	19.31	17.19
1/1/23 12:00	12.63	14.60	19.33	17.17
1/1/23 13:00	12.63	14.60	19.33	17.17
1/1/23 14:00	12.64	14.60	19.31	17.19
1/1/23 15:00	12.67	14.60	19.25	17.25
1/1/23 16:00	12.71	14.60	19.14	17.36
1/1/23 17:00	12.77	14.60	19.00	17.50
1/1/23 18:00	12.85	14.60	18.84	17.66
1/1/23 19:00	12.92	14.59	18.67	17.83
1/1/23 20:00	12.97	14.60	18.55	17.95
1/1/23 21:00	12.99	14.60	18.49	18.01
1/1/23 22:00	12.97	14.60	18.54	17.96
1/1/23 23:00	12.91	14.60	18.69	17.81
1/2/23 0:00	12.82	14.60	18.90	17.60
1/2/23 1:00	12.72	14.61	19.13	17.37
1/2/23 2:00	12.62	14.61	19.36	17.14
1/2/23 3:00	12.54	14.60	19.54	16.96
1/2/23 4:00	12.49	14.60	19.66	16.84
1/2/23 5:00	12.46	14.60	19.72	16.78
1/2/23 6:00	12.47	14.60	19.71	16.79
1/2/23 7:00	12.49	14.60	19.66	16.84
1/2/23 8:00	12.52	14.60	19.59	16.91
1/2/23 9:00	12.56	14.60	19.50	17.00
1/2/23 10:00	12.59	14.60	19.42	17.08
1/2/23 11:00	12.61	14.60	19.37	17.13
1/2/23 12:00	12.63	14.60	19.34	17.16
1/2/23 13:00	12.64	14.60	19.30	17.20
1/2/23 14:00	12.66	14.60	19.27	17.23
1/2/23 15:00	12.68	14.60	19.21	17.29
1/2/23 16:00	12.72	14.60	19.13	17.37
1/2/23 17:00	12.77	14.60	19.01	17.49
1/2/23 18:00	12.83	14.60	18.86	17.64
1/2/23 19:00	12.91	14.60	18.70	17.80
1/2/23 20:00	12.97	14.60	18.54	17.96
1/2/23 21:00	13.02	14.60	18.43	18.07
1/2/23 22:00	13.04	14.60	18.40	18.10

Date/Time	Average Hourly Pressure (psi) (694389)	Average Hourly Temperature (°C) (694389)	Average Hourly Depth To Water (ft) (694389)	Average Hourly Groundwater Elevation (feet NAVD88)
1/2/23 23:00	13.00	14.60	18.49	18.01
1/3/23 0:00	12.92	14.60	18.67	17.83
1/3/23 1:00	12.82	14.61	18.91	17.59
1/3/23 2:00	12.70	14.61	19.16	17.34
1/3/23 3:00	12.60	14.61	19.40	17.10
1/3/23 4:00	12.52	14.60	19.59	16.91
1/3/23 5:00	12.47	14.60	19.71	16.79
1/3/23 6:00	12.45	14.60	19.75	16.75
1/3/23 7:00	12.46	14.60	19.73	16.77
1/3/23 8:00	12.49	14.60	19.66	16.84
1/3/23 9:00	12.54	14.60	19.55	16.95
1/3/23 10:00	12.58	14.60	19.44	17.06
1/3/23 11:00	12.63	14.60	19.34	17.16
1/3/23 12:00	12.66	14.60	19.26	17.24
1/3/23 13:00	12.68	14.60	19.22	17.28
1/3/23 14:00	12.69	14.60	19.19	17.31
1/3/23 15:00	12.71	14.60	19.15	17.35
1/3/23 16:00	12.74	14.60	19.09	17.41
1/3/23 17:00	12.77	14.60	19.01	17.49
1/3/23 18:00	12.82	14.60	18.90	17.60
1/3/23 19:00	12.87	14.60	18.77	17.73
1/3/23 20:00	12.93	14.60	18.63	17.87
1/3/23 21:00	12.99	14.60	18.51	17.99
1/3/23 22:00	13.02	14.60	18.43	18.07
1/3/23 23:00	13.01	14.60	18.47	18.03
1/4/23 0:00	12.94	14.61	18.62	17.88
1/4/23 1:00	12.84	14.60	18.85	17.65
1/4/23 2:00	12.72	14.61	19.13	17.37
1/4/23 3:00	12.60	14.61	19.41	17.09
1/4/23 4:00	12.49	14.61	19.66	16.84
1/4/23 5:00	12.41	14.61	19.84	16.66
1/4/23 6:00	12.37	14.61	19.93	16.57
1/4/23 7:00	12.36	14.61	19.95	16.55
1/4/23 8:00	12.39	14.60	19.90	16.60
1/4/23 9:00	12.43	14.60	19.80	16.70
1/4/23 10:00	12.48	14.60	19.67	16.83
1/4/23 11:00	12.54	14.61	19.53	16.97
1/4/23 12:00	12.59	14.61	19.42	17.08
1/4/23 13:00	12.63	14.60	19.33	17.17
1/4/23 14:00	12.66	14.60	19.27	17.23
1/4/23 15:00	12.68	14.60	19.22	17.28
1/4/23 16:00	12.71	14.60	19.16	17.34
1/4/23 17:00	12.73	14.61	19.10	17.40
1/4/23 18:00	12.77	14.60	19.00	17.50
1/4/23 19:00	12.83	14.60	18.88	17.62
1/4/23 20:00	12.89	14.60	18.74	17.76
1/4/23 21:00	12.96	14.60	18.58	17.92
1/4/23 22:00	13.01	14.60	18.46	18.04

Date/Time	Average Hourly Pressure (psi) (694389)	Average Hourly Temperature (°C) (694389)	Average Hourly Depth To Water (ft) (694389)	Average Hourly Groundwater Elevation (feet NAVD88)
1/4/23 23:00	13.03	14.61	18.41	18.09
1/5/23 0:00	13.00	14.61	18.48	18.02
1/5/23 1:00	12.92	14.61	18.66	17.84
1/5/23 2:00	12.81	14.61	18.91	17.59
1/5/23 3:00	12.69	14.61	19.20	17.30
1/5/23 4:00	12.57	14.61	19.47	17.03
1/5/23 5:00	12.47	14.61	19.70	16.80
1/5/23 6:00	12.41	14.61	19.84	16.66
1/5/23 7:00	12.39	14.60	19.89	16.61
1/5/23 8:00	12.40	14.61	19.86	16.64
1/5/23 9:00	12.44	14.61	19.77	16.73
1/5/23 10:00	12.50	14.61	19.63	16.87
1/5/23 11:00	12.57	14.61	19.47	17.03
1/5/23 12:00	12.64	14.61	19.32	17.18
1/5/23 13:00	12.69	14.61	19.20	17.30
1/5/23 14:00	12.72	14.60	19.12	17.38
1/5/23 15:00	12.75	14.61	19.05	17.45
1/5/23 16:00	12.78	14.61	18.99	17.51
1/5/23 17:00	12.80	14.61	18.94	17.56
1/5/23 18:00	12.83	14.60	18.87	17.63
1/5/23 19:00	12.87	14.61	18.77	17.73
1/5/23 20:00	12.93	14.61	18.65	17.85
1/5/23 21:00	12.99	14.61	18.51	17.99
1/5/23 22:00	13.05	14.61	18.37	18.13
1/5/23 23:00	13.09	14.61	18.28	18.22
1/6/23 0:00	13.09	14.61	18.27	18.23
1/6/23 1:00	13.04	14.61	18.40	18.10
1/6/23 2:00	12.94	14.61	18.62	17.88
1/6/23 3:00	12.82	14.61	18.89	17.61
1/6/23 4:00	12.70	14.61	19.18	17.32
1/6/23 5:00	12.58	14.61	19.45	17.05
1/6/23 6:00	12.49	14.62	19.65	16.85
1/6/23 7:00	12.44	14.61	19.78	16.72
1/6/23 8:00	12.42	14.61	19.81	16.69
1/6/23 9:00	12.44	14.61	19.77	16.73
1/6/23 10:00	12.48	14.61	19.67	16.83
1/6/23 11:00	12.54	14.61	19.54	16.96
1/6/23 12:00	12.60	14.61	19.40	17.10
1/6/23 13:00	12.66	14.61	19.27	17.23
1/6/23 14:00	12.70	14.60	19.18	17.32
1/6/23 15:00	12.72	14.61	19.13	17.37
1/6/23 16:00	12.74	14.61	19.09	17.41
1/6/23 17:00	12.75	14.61	19.05	17.45
1/6/23 18:00	12.77	14.61	19.00	17.50
1/6/23 19:00	12.80	14.61	18.93	17.57
1/6/23 20:00	12.85	14.61	18.82	17.68
1/6/23 21:00	12.91	14.61	18.69	17.81
1/6/23 22:00	12.97	14.61	18.54	17.96

Date/Time	Average Hourly Pressure (psi) (694389)	Average Hourly Temperature (°C) (694389)	Average Hourly Depth To Water (ft) (694389)	Average Hourly Groundwater Elevation (feet NAVD88)
1/6/23 23:00	13.03	14.61	18.41	18.09
1/7/23 0:00	13.07	14.61	18.32	18.18
1/7/23 1:00	13.05	14.61	18.35	18.15
1/7/23 2:00	12.98	14.62	18.52	17.98
1/7/23 3:00	12.88	14.61	18.75	17.75
1/7/23 4:00	12.76	14.61	19.03	17.47
1/7/23 5:00	12.64	14.62	19.31	17.19
1/7/23 6:00	12.53	14.62	19.56	16.94
1/7/23 7:00	12.46	14.61	19.72	16.78
1/7/23 8:00	12.43	14.62	19.80	16.70
1/7/23 9:00	12.43	14.61	19.79	16.71
1/7/23 10:00	12.47	14.61	19.71	16.79
1/7/23 11:00	12.53	14.61	19.58	16.92
1/7/23 12:00	12.59	14.61	19.42	17.08
1/7/23 13:00	12.66	14.61	19.26	17.24
1/7/23 14:00	12.72	14.61	19.12	17.38
1/7/23 15:00	12.76	14.61	19.03	17.47
1/7/23 16:00	12.79	14.62	18.96	17.54
1/7/23 17:00	12.81	14.61	18.91	17.59
1/7/23 18:00	12.83	14.61	18.86	17.64
1/7/23 19:00	12.86	14.61	18.81	17.69
1/7/23 20:00	12.90	14.61	18.71	17.79
1/7/23 21:00	12.95	14.61	18.59	17.91
1/7/23 22:00	13.01	14.61	18.45	18.05
1/7/23 23:00	13.08	14.61	18.31	18.19
1/8/23 0:00	13.12	14.62	18.21	18.29

NBKK-OUA5-MW01

Date/Time	Average Hourly Pressure (psi) (694170)	Average Hourly Temperature (°C) (694170)	Average Hourly Depth To Water (ft) (694170)	Average Hourly Groundwater Elevation (feet NAVD88)
1/1/23 0:00	18.68	12.71	15.03	6.41
1/1/23 1:00	18.90	12.71	14.51	6.93
1/1/23 2:00	19.17	12.71	13.89	7.55
1/1/23 3:00	19.35	12.71	13.48	7.96
1/1/23 4:00	19.43	12.71	13.29	8.15
1/1/23 5:00	19.43	12.71	13.29	8.15
1/1/23 6:00	19.37	12.71	13.43	8.01
1/1/23 7:00	19.29	12.71	13.62	7.82
1/1/23 8:00	19.23	12.72	13.74	7.70
1/1/23 9:00	19.27	12.72	13.66	7.78
1/1/23 10:00	19.42	12.72	13.32	8.12
1/1/23 11:00	19.64	12.71	12.80	8.64
1/1/23 12:00	19.90	12.72	12.20	9.24
1/1/23 13:00	20.14	12.72	11.64	9.80
1/1/23 14:00	20.28	12.71	11.33	10.11
1/1/23 15:00	20.25	12.72	11.40	10.04
1/1/23 16:00	20.05	12.71	11.85	9.59
1/1/23 17:00	19.72	12.71	12.62	8.82
1/1/23 18:00	19.28	12.72	13.63	7.81
1/1/23 19:00	18.82	12.71	14.70	6.74
1/1/23 20:00	18.38	12.72	15.71	5.73
1/1/23 21:00	18.05	12.72	16.48	4.96
1/1/23 22:00	17.88	12.71	16.88	4.56
1/1/23 23:00	17.88	12.71	16.87	4.57
1/2/23 0:00	18.05	12.72	16.47	4.97
1/2/23 1:00	18.38	12.72	15.72	5.72
1/2/23 2:00	18.77	12.71	14.82	6.62
1/2/23 3:00	19.13	12.71	13.98	7.46
1/2/23 4:00	19.41	12.72	13.34	8.10
1/2/23 5:00	19.57	12.72	12.97	8.47
1/2/23 6:00	19.64	12.71	12.81	8.63
1/2/23 7:00	19.64	12.71	12.81	8.63
1/2/23 8:00	19.58	12.71	12.94	8.50
1/2/23 9:00	19.54	12.72	13.03	8.41
1/2/23 10:00	19.57	12.71	12.96	8.48
1/2/23 11:00	19.69	12.72	12.69	8.75
1/2/23 12:00	19.87	12.72	12.26	9.18
1/2/23 13:00	20.07	12.71	11.81	9.63
1/2/23 14:00	20.26	12.71	11.38	10.06
1/2/23 15:00	20.33	12.71	11.21	10.23
1/2/23 16:00	20.25	12.71	11.39	10.05
1/2/23 17:00	20.02	12.71	11.93	9.51
1/2/23 18:00	19.65	12.71	12.77	8.67
1/2/23 19:00	19.20	12.71	13.83	7.61
1/2/23 20:00	18.71	12.71	14.94	6.50
1/2/23 21:00	18.27	12.72	15.96	5.48
1/2/23 22:00	17.95	12.71	16.70	4.74

Date/Time	Average Hourly Pressure (psi) (694170)	Average Hourly Temperature (°C) (694170)	Average Hourly Depth To Water (ft) (694170)	Average Hourly Groundwater Elevation (feet NAVD88)
1/2/23 23:00	17.82	12.71	17.01	4.43
1/3/23 0:00	17.87	12.72	16.88	4.56
1/3/23 1:00	18.11	12.72	16.34	5.10
1/3/23 2:00	18.50	12.71	15.43	6.01
1/3/23 3:00	18.97	12.71	14.35	7.09
1/3/23 4:00	19.40	12.72	13.36	8.08
1/3/23 5:00	19.71	12.71	12.64	8.80
1/3/23 6:00	19.89	12.71	12.23	9.21
1/3/23 7:00	19.94	12.71	12.11	9.33
1/3/23 8:00	19.91	12.71	12.17	9.27
1/3/23 9:00	19.82	12.71	12.38	9.06
1/3/23 10:00	19.74	12.72	12.57	8.87
1/3/23 11:00	19.72	12.71	12.62	8.82
1/3/23 12:00	19.79	12.72	12.46	8.98
1/3/23 13:00	19.93	12.71	12.14	9.30
1/3/23 14:00	20.07	12.71	11.81	9.63
1/3/23 15:00	20.17	12.71	11.57	9.87
1/3/23 16:00	20.18	12.71	11.56	9.88
1/3/23 17:00	20.04	12.71	11.88	9.56
1/3/23 18:00	19.74	12.71	12.57	8.87
1/3/23 19:00	19.33	12.72	13.52	7.92
1/3/23 20:00	18.86	12.72	14.61	6.83
1/3/23 21:00	18.37	12.72	15.73	5.71
1/3/23 22:00	17.94	12.72	16.72	4.72
1/3/23 23:00	17.67	12.72	17.35	4.09
1/4/23 0:00	17.61	12.72	17.50	3.94
1/4/23 1:00	17.73	12.72	17.21	4.23
1/4/23 2:00	18.06	12.72	16.45	4.99
1/4/23 3:00	18.54	12.71	15.34	6.10
1/4/23 4:00	19.06	12.72	14.14	7.30
1/4/23 5:00	19.50	12.71	13.12	8.32
1/4/23 6:00	19.81	12.72	12.40	9.04
1/4/23 7:00	19.97	12.71	12.03	9.41
1/4/23 8:00	20.01	12.71	11.96	9.48
1/4/23 9:00	19.96	12.72	12.07	9.37
1/4/23 10:00	19.85	12.71	12.31	9.13
1/4/23 11:00	19.76	12.72	12.53	8.91
1/4/23 12:00	19.75	12.72	12.54	8.90
1/4/23 13:00	19.83	12.72	12.37	9.07
1/4/23 14:00	19.97	12.71	12.05	9.39
1/4/23 15:00	20.10	12.71	11.75	9.69
1/4/23 16:00	20.18	12.71	11.55	9.89
1/4/23 17:00	20.15	12.71	11.63	9.81
1/4/23 18:00	19.96	12.72	12.07	9.37
1/4/23 19:00	19.61	12.71	12.86	8.58
1/4/23 20:00	19.18	12.72	13.88	7.56
1/4/23 21:00	18.69	12.72	15.00	6.44
1/4/23 22:00	18.21	12.72	16.11	5.33

Date/Time	Average Hourly Pressure (psi) (694170)	Average Hourly Temperature (°C) (694170)	Average Hourly Depth To Water (ft) (694170)	Average Hourly Groundwater Elevation (feet NAVD88)
1/4/23 23:00	17.82	12.72	17.00	4.44
1/5/23 0:00	17.63	12.72	17.45	3.99
1/5/23 1:00	17.65	12.72	17.40	4.04
1/5/23 2:00	17.88	12.72	16.86	4.58
1/5/23 3:00	18.33	12.72	15.82	5.62
1/5/23 4:00	18.91	12.71	14.50	6.94
1/5/23 5:00	19.47	12.72	13.20	8.24
1/5/23 6:00	19.92	12.71	12.17	9.27
1/5/23 7:00	20.20	12.71	11.52	9.92
1/5/23 8:00	20.31	12.71	11.26	10.18
1/5/23 9:00	20.30	12.72	11.29	10.15
1/5/23 10:00	20.20	12.71	11.50	9.94
1/5/23 11:00	20.07	12.72	11.80	9.64
1/5/23 12:00	19.99	12.72	12.00	9.44
1/5/23 13:00	20.00	12.71	11.96	9.48
1/5/23 14:00	20.10	12.71	11.75	9.69
1/5/23 15:00	20.23	12.72	11.43	10.01
1/5/23 16:00	20.34	12.71	11.18	10.26
1/5/23 17:00	20.40	12.72	11.05	10.39
1/5/23 18:00	20.31	12.71	11.26	10.18
1/5/23 19:00	20.05	12.71	11.85	9.59
1/5/23 20:00	19.66	12.71	12.75	8.69
1/5/23 21:00	19.18	12.72	13.87	7.57
1/5/23 22:00	18.67	12.72	15.04	6.40
1/5/23 23:00	18.20	12.72	16.12	5.32
1/6/23 0:00	17.86	12.72	16.92	4.52
1/6/23 1:00	17.73	12.72	17.22	4.22
1/6/23 2:00	17.81	12.72	17.02	4.42
1/6/23 3:00	18.11	12.72	16.35	5.09
1/6/23 4:00	18.59	12.71	15.23	6.21
1/6/23 5:00	19.15	12.72	13.93	7.51
1/6/23 6:00	19.65	12.71	12.77	8.67
1/6/23 7:00	20.02	12.72	11.93	9.51
1/6/23 8:00	20.20	12.71	11.52	9.92
1/6/23 9:00	20.23	12.71	11.44	10.00
1/6/23 10:00	20.16	12.71	11.60	9.84
1/6/23 11:00	20.02	12.72	11.93	9.51
1/6/23 12:00	19.87	12.71	12.27	9.17
1/6/23 13:00	19.81	12.71	12.41	9.03
1/6/23 14:00	19.86	12.71	12.29	9.15
1/6/23 15:00	19.99	12.71	11.99	9.45
1/6/23 16:00	20.15	12.71	11.62	9.82
1/6/23 17:00	20.29	12.71	11.30	10.14
1/6/23 18:00	20.32	12.71	11.24	10.20
1/6/23 19:00	20.19	12.71	11.54	9.90
1/6/23 20:00	19.87	12.72	12.27	9.17
1/6/23 21:00	19.45	12.72	13.25	8.19
1/6/23 22:00	18.95	12.71	14.39	7.05

Date/Time	Average Hourly Pressure (psi) (694170)	Average Hourly Temperature (°C) (694170)	Average Hourly Depth To Water (ft) (694170)	Average Hourly Groundwater Elevation (feet NAVD88)
1/6/23 23:00	18.45	12.72	15.55	5.89
1/7/23 0:00	18.02	12.72	16.55	4.89
1/7/23 1:00	17.75	12.72	17.17	4.27
1/7/23 2:00	17.71	12.72	17.25	4.19
1/7/23 3:00	17.89	12.72	16.85	4.59
1/7/23 4:00	18.29	12.71	15.93	5.51
1/7/23 5:00	18.85	12.72	14.64	6.80
1/7/23 6:00	19.43	12.72	13.28	8.16
1/7/23 7:00	19.92	12.71	12.16	9.28
1/7/23 8:00	20.23	12.71	11.43	10.01
1/7/23 9:00	20.37	12.71	11.12	10.32
1/7/23 10:00	20.35	12.71	11.15	10.29
1/7/23 11:00	20.25	12.72	11.38	10.06
1/7/23 12:00	20.09	12.72	11.75	9.69
1/7/23 13:00	19.96	12.71	12.05	9.39
1/7/23 14:00	20.01	12.72	11.94	9.50
1/7/23 15:00	20.12	12.71	11.68	9.76
1/7/23 16:00	20.26	12.72	11.38	10.06
1/7/23 17:00	20.36	12.72	11.13	10.31
1/7/23 18:00	20.43	12.72	10.99	10.45
1/7/23 19:00	20.33	12.71	11.21	10.23
1/7/23 20:00	20.08	12.72	11.78	9.66
1/7/23 21:00	19.72	12.71	12.62	8.82
1/7/23 22:00	19.26	12.72	13.69	7.75
1/7/23 23:00	18.76	12.72	14.85	6.59
1/8/23 0:00	18.39	12.72	15.70	5.74

NBKK-OUA5-MW02

Date/Time	Average Hourly Pressure (psi) (837752)	Average Hourly Temperature (°C) (837752)	Average Hourly Depth To Water (ft) (837752)	Average Hourly Groundwater Elevation (feet NAVD88)
1/1/23 0:00	17.36	13.27	10.36	7.70
1/1/23 1:00	17.47	13.27	10.10	7.96
1/1/23 2:00	17.63	13.27	9.74	8.32
1/1/23 3:00	17.73	13.26	9.50	8.56
1/1/23 4:00	17.78	13.26	9.38	8.68
1/1/23 5:00	17.79	13.27	9.36	8.70
1/1/23 6:00	17.75	13.27	9.45	8.61
1/1/23 7:00	17.72	13.27	9.52	8.54
1/1/23 8:00	17.70	13.27	9.56	8.50
1/1/23 9:00	17.74	13.26	9.48	8.58
1/1/23 10:00	17.83	13.26	9.28	8.78
1/1/23 11:00	17.98	13.26	8.93	9.13
1/1/23 12:00	18.14	13.26	8.55	9.51
1/1/23 13:00	18.29	13.26	8.21	9.85
1/1/23 14:00	18.38	13.26	8.01	10.05
1/1/23 15:00	18.36	13.26	8.05	10.01
1/1/23 16:00	18.25	13.27	8.31	9.75
1/1/23 17:00	18.06	13.27	8.75	9.31
1/1/23 18:00	17.81	13.28	9.31	8.75
1/1/23 19:00	17.56	13.28	9.90	8.16
1/1/23 20:00	17.31	13.28	10.48	7.58
1/1/23 21:00	17.08	13.28	11.00	7.06
1/1/23 22:00	16.92	13.28	11.38	6.68
1/1/23 23:00	16.84	13.28	11.56	6.50
1/2/23 0:00	16.88	13.27	11.47	6.59
1/2/23 1:00	17.03	13.27	11.13	6.93
1/2/23 2:00	17.23	13.26	10.65	7.41
1/2/23 3:00	17.45	13.26	10.16	7.90
1/2/23 4:00	17.63	13.26	9.74	8.32
1/2/23 5:00	17.73	13.26	9.50	8.56
1/2/23 6:00	17.79	13.26	9.36	8.70
1/2/23 7:00	17.80	13.26	9.33	8.73
1/2/23 8:00	17.79	13.26	9.37	8.69
1/2/23 9:00	17.82	13.27	9.29	8.77
1/2/23 10:00	17.87	13.26	9.18	8.88
1/2/23 11:00	17.96	13.26	8.98	9.08
1/2/23 12:00	18.07	13.26	8.71	9.35
1/2/23 13:00	18.22	13.26	8.38	9.68
1/2/23 14:00	18.36	13.26	8.05	10.01
1/2/23 15:00	18.40	13.26	7.95	10.11
1/2/23 16:00	18.37	13.26	8.03	10.03
1/2/23 17:00	18.24	13.27	8.32	9.74
1/2/23 18:00	18.04	13.27	8.79	9.27
1/2/23 19:00	17.79	13.28	9.37	8.69
1/2/23 20:00	17.53	13.28	9.97	8.09
1/2/23 21:00	17.28	13.29	10.55	7.51
1/2/23 22:00	17.06	13.28	11.06	7.00

Date/Time	Average Hourly Pressure (psi) (837752)	Average Hourly Temperature (°C) (837752)	Average Hourly Depth To Water (ft) (837752)	Average Hourly Groundwater Elevation (feet NAVD88)
1/2/23 23:00	16.91	13.28	11.41	6.65
1/3/23 0:00	16.86	13.28	11.52	6.54
1/3/23 1:00	16.94	13.28	11.32	6.74
1/3/23 2:00	17.15	13.27	10.84	7.22
1/3/23 3:00	17.39	13.26	10.29	7.77
1/3/23 4:00	17.66	13.26	9.67	8.39
1/3/23 5:00	17.86	13.26	9.20	8.86
1/3/23 6:00	17.99	13.26	8.91	9.15
1/3/23 7:00	18.03	13.26	8.81	9.25
1/3/23 8:00	18.04	13.26	8.78	9.28
1/3/23 9:00	18.02	13.27	8.85	9.21
1/3/23 10:00	18.00	13.27	8.89	9.17
1/3/23 11:00	18.01	13.27	8.85	9.21
1/3/23 12:00	18.07	13.26	8.72	9.34
1/3/23 13:00	18.16	13.26	8.50	9.56
1/3/23 14:00	18.26	13.26	8.27	9.79
1/3/23 15:00	18.34	13.27	8.10	9.96
1/3/23 16:00	18.35	13.27	8.08	9.98
1/3/23 17:00	18.26	13.27	8.28	9.78
1/3/23 18:00	18.08	13.27	8.69	9.37
1/3/23 19:00	17.85	13.28	9.23	8.83
1/3/23 20:00	17.59	13.28	9.83	8.23
1/3/23 21:00	17.32	13.29	10.45	7.61
1/3/23 22:00	17.06	13.29	11.04	7.02
1/3/23 23:00	16.85	13.29	11.54	6.52
1/4/23 0:00	16.73	13.28	11.83	6.23
1/4/23 1:00	16.71	13.28	11.85	6.21
1/4/23 2:00	16.85	13.28	11.53	6.53
1/4/23 3:00	17.12	13.27	10.91	7.15
1/4/23 4:00	17.43	13.26	10.20	7.86
1/4/23 5:00	17.71	13.26	9.55	8.51
1/4/23 6:00	17.91	13.26	9.09	8.97
1/4/23 7:00	18.03	13.26	8.81	9.25
1/4/23 8:00	18.08	13.27	8.70	9.36
1/4/23 9:00	18.07	13.26	8.71	9.35
1/4/23 10:00	18.03	13.27	8.82	9.24
1/4/23 11:00	17.99	13.27	8.91	9.15
1/4/23 12:00	18.01	13.27	8.87	9.19
1/4/23 13:00	18.08	13.27	8.71	9.35
1/4/23 14:00	18.18	13.26	8.47	9.59
1/4/23 15:00	18.27	13.26	8.25	9.81
1/4/23 16:00	18.33	13.26	8.11	9.95
1/4/23 17:00	18.30	13.27	8.18	9.88
1/4/23 18:00	18.18	13.27	8.47	9.59
1/4/23 19:00	17.97	13.28	8.94	9.12
1/4/23 20:00	17.73	13.28	9.50	8.56
1/4/23 21:00	17.47	13.28	10.11	7.95
1/4/23 22:00	17.20	13.29	10.74	7.32

Date/Time	Average Hourly Pressure (psi) (837752)	Average Hourly Temperature (°C) (837752)	Average Hourly Depth To Water (ft) (837752)	Average Hourly Groundwater Elevation (feet NAVD88)
1/4/23 23:00	16.93	13.29	11.36	6.70
1/5/23 0:00	16.74	13.29	11.80	6.26
1/5/23 1:00	16.66	13.28	11.97	6.09
1/5/23 2:00	16.73	13.28	11.82	6.24
1/5/23 3:00	16.96	13.27	11.28	6.78
1/5/23 4:00	17.29	13.27	10.52	7.54
1/5/23 5:00	17.63	13.26	9.72	8.34
1/5/23 6:00	17.94	13.26	9.02	9.04
1/5/23 7:00	18.15	13.26	8.53	9.53
1/5/23 8:00	18.26	13.26	8.27	9.79
1/5/23 9:00	18.27	13.27	8.25	9.81
1/5/23 10:00	18.25	13.27	8.32	9.74
1/5/23 11:00	18.20	13.27	8.42	9.64
1/5/23 12:00	18.19	13.27	8.44	9.62
1/5/23 13:00	18.22	13.26	8.37	9.69
1/5/23 14:00	18.30	13.26	8.20	9.86
1/5/23 15:00	18.40	13.26	7.95	10.11
1/5/23 16:00	18.50	13.27	7.73	10.33
1/5/23 17:00	18.53	13.26	7.65	10.41
1/5/23 18:00	18.48	13.27	7.77	10.29
1/5/23 19:00	18.34	13.27	8.10	9.96
1/5/23 20:00	18.12	13.28	8.60	9.46
1/5/23 21:00	17.86	13.28	9.19	8.87
1/5/23 22:00	17.56	13.28	9.90	8.16
1/5/23 23:00	17.29	13.29	10.52	7.54
1/6/23 0:00	17.03	13.29	11.11	6.95
1/6/23 1:00	16.88	13.29	11.46	6.60
1/6/23 2:00	16.83	13.28	11.59	6.47
1/6/23 3:00	16.93	13.28	11.34	6.72
1/6/23 4:00	17.17	13.27	10.80	7.26
1/6/23 5:00	17.51	13.27	10.01	8.05
1/6/23 6:00	17.85	13.26	9.23	8.83
1/6/23 7:00	18.10	13.26	8.66	9.40
1/6/23 8:00	18.23	13.26	8.34	9.72
1/6/23 9:00	18.28	13.27	8.24	9.82
1/6/23 10:00	18.26	13.27	8.29	9.77
1/6/23 11:00	18.19	13.27	8.44	9.62
1/6/23 12:00	18.13	13.27	8.58	9.48
1/6/23 13:00	18.11	13.27	8.62	9.44
1/6/23 14:00	18.15	13.27	8.53	9.53
1/6/23 15:00	18.24	13.27	8.33	9.73
1/6/23 16:00	18.35	13.26	8.07	9.99
1/6/23 17:00	18.45	13.26	7.85	10.21
1/6/23 18:00	18.48	13.26	7.78	10.28
1/6/23 19:00	18.40	13.27	7.97	10.09
1/6/23 20:00	18.21	13.28	8.41	9.65
1/6/23 21:00	17.96	13.28	8.97	9.09
1/6/23 22:00	17.68	13.28	9.61	8.45

Date/Time	Average Hourly Pressure (psi) (837752)	Average Hourly Temperature (°C) (837752)	Average Hourly Depth To Water (ft) (837752)	Average Hourly Groundwater Elevation (feet NAVD88)
1/6/23 23:00	17.40	13.29	10.27	7.79
1/7/23 0:00	17.13	13.29	10.88	7.18
1/7/23 1:00	16.91	13.29	11.40	6.66
1/7/23 2:00	16.78	13.29	11.69	6.37
1/7/23 3:00	16.80	13.28	11.65	6.41
1/7/23 4:00	16.98	13.28	11.24	6.82
1/7/23 5:00	17.28	13.27	10.54	7.52
1/7/23 6:00	17.65	13.26	9.69	8.37
1/7/23 7:00	17.98	13.26	8.93	9.13
1/7/23 8:00	18.20	13.26	8.42	9.64
1/7/23 9:00	18.31	13.27	8.18	9.88
1/7/23 10:00	18.31	13.27	8.17	9.89
1/7/23 11:00	18.27	13.27	8.25	9.81
1/7/23 12:00	18.20	13.27	8.41	9.65
1/7/23 13:00	18.17	13.27	8.50	9.56
1/7/23 14:00	18.18	13.27	8.46	9.60
1/7/23 15:00	18.22	13.27	8.37	9.69
1/7/23 16:00	18.30	13.27	8.19	9.87
1/7/23 17:00	18.39	13.27	7.98	10.08
1/7/23 18:00	18.46	13.27	7.83	10.23
1/7/23 19:00	18.45	13.27	7.84	10.22
1/7/23 20:00	18.33	13.27	8.13	9.93
1/7/23 21:00	18.11	13.28	8.62	9.44
1/7/23 22:00	17.85	13.28	9.23	8.83
1/7/23 23:00	17.56	13.28	9.91	8.15
1/8/23 0:00	17.34	13.29	10.40	7.66

NBKK-OUA5-MW03

Date/Time	Average Hourly Pressure (psi) (847424)	Average Hourly Temperature (°C) (847424)	Average Hourly Depth To Water (ft) (847424)	Average Hourly Groundwater Elevation (feet NAVD88)
1/1/23 0:00	10.02	13.77	9.79	15.89
1/1/23 1:00	9.95	13.76	9.94	15.74
1/1/23 2:00	9.87	13.75	10.14	15.54
1/1/23 3:00	9.80	13.75	10.30	15.38
1/1/23 4:00	9.75	13.75	10.42	15.26
1/1/23 5:00	9.72	13.76	10.48	15.20
1/1/23 6:00	9.71	13.76	10.51	15.17
1/1/23 7:00	9.71	13.76	10.50	15.18
1/1/23 8:00	9.72	13.76	10.47	15.21
1/1/23 9:00	9.73	13.76	10.45	15.23
1/1/23 10:00	9.73	13.77	10.45	15.23
1/1/23 11:00	9.72	13.77	10.47	15.21
1/1/23 12:00	9.71	13.77	10.49	15.19
1/1/23 13:00	9.71	13.77	10.51	15.17
1/1/23 14:00	9.71	13.77	10.50	15.18
1/1/23 15:00	9.72	13.77	10.48	15.20
1/1/23 16:00	9.75	13.77	10.41	15.27
1/1/23 17:00	9.79	13.77	10.31	15.37
1/1/23 18:00	9.85	13.78	10.17	15.51
1/1/23 19:00	9.93	13.78	9.99	15.69
1/1/23 20:00	10.00	13.78	9.82	15.86
1/1/23 21:00	10.06	13.78	9.69	15.99
1/1/23 22:00	10.08	13.78	9.65	16.03
1/1/23 23:00	10.05	13.77	9.71	15.97
1/2/23 0:00	9.99	13.77	9.86	15.82
1/2/23 1:00	9.89	13.77	10.08	15.60
1/2/23 2:00	9.79	13.77	10.31	15.37
1/2/23 3:00	9.70	13.77	10.53	15.15
1/2/23 4:00	9.62	13.77	10.71	14.97
1/2/23 5:00	9.57	13.77	10.83	14.85
1/2/23 6:00	9.54	13.77	10.89	14.79
1/2/23 7:00	9.54	13.77	10.89	14.79
1/2/23 8:00	9.55	13.77	10.86	14.82
1/2/23 9:00	9.58	13.77	10.80	14.88
1/2/23 10:00	9.61	13.77	10.73	14.95
1/2/23 11:00	9.64	13.77	10.67	15.01
1/2/23 12:00	9.65	13.77	10.63	15.05
1/2/23 13:00	9.67	13.77	10.59	15.09
1/2/23 14:00	9.69	13.77	10.56	15.12
1/2/23 15:00	9.70	13.77	10.52	15.16
1/2/23 16:00	9.73	13.76	10.46	15.22
1/2/23 17:00	9.76	13.76	10.37	15.31
1/2/23 18:00	9.82	13.76	10.25	15.43
1/2/23 19:00	9.88	13.77	10.10	15.58
1/2/23 20:00	9.96	13.77	9.92	15.76
1/2/23 21:00	10.03	13.77	9.76	15.92
1/2/23 22:00	10.08	13.77	9.65	16.03

Date/Time	Average Hourly Pressure (psi) (847424)	Average Hourly Temperature (°C) (847424)	Average Hourly Depth To Water (ft) (847424)	Average Hourly Groundwater Elevation (feet NAVD88)
1/2/23 23:00	10.08	13.77	9.63	16.05
1/3/23 0:00	10.04	13.77	9.73	15.95
1/3/23 1:00	9.96	13.77	9.92	15.76
1/3/23 2:00	9.86	13.77	10.16	15.52
1/3/23 3:00	9.74	13.77	10.42	15.26
1/3/23 4:00	9.64	13.76	10.65	15.03
1/3/23 5:00	9.57	13.76	10.83	14.85
1/3/23 6:00	9.52	13.77	10.95	14.73
1/3/23 7:00	9.49	13.77	11.00	14.68
1/3/23 8:00	9.50	13.77	10.99	14.69
1/3/23 9:00	9.52	13.78	10.93	14.75
1/3/23 10:00	9.56	13.78	10.84	14.84
1/3/23 11:00	9.61	13.78	10.74	14.94
1/3/23 12:00	9.64	13.78	10.65	15.03
1/3/23 13:00	9.67	13.77	10.59	15.09
1/3/23 14:00	9.69	13.77	10.54	15.14
1/3/23 15:00	9.71	13.77	10.50	15.18
1/3/23 16:00	9.73	13.77	10.46	15.22
1/3/23 17:00	9.75	13.77	10.40	15.28
1/3/23 18:00	9.79	13.77	10.31	15.37
1/3/23 19:00	9.84	13.77	10.20	15.48
1/3/23 20:00	9.90	13.77	10.05	15.63
1/3/23 21:00	9.98	13.77	9.89	15.79
1/3/23 22:00	10.04	13.77	9.74	15.94
1/3/23 23:00	10.07	13.77	9.68	16.00
1/4/23 0:00	10.05	13.77	9.72	15.96
1/4/23 1:00	9.98	13.77	9.88	15.80
1/4/23 2:00	9.87	13.76	10.12	15.56
1/4/23 3:00	9.75	13.76	10.40	15.28
1/4/23 4:00	9.63	13.76	10.68	15.00
1/4/23 5:00	9.53	13.76	10.91	14.77
1/4/23 6:00	9.46	13.76	11.08	14.60
1/4/23 7:00	9.41	13.76	11.18	14.50
1/4/23 8:00	9.40	13.76	11.21	14.47
1/4/23 9:00	9.42	13.76	11.17	14.51
1/4/23 10:00	9.46	13.76	11.08	14.60
1/4/23 11:00	9.51	13.77	10.97	14.71
1/4/23 12:00	9.56	13.77	10.85	14.83
1/4/23 13:00	9.60	13.77	10.74	14.94
1/4/23 14:00	9.64	13.77	10.66	15.02
1/4/23 15:00	9.67	13.77	10.60	15.08
1/4/23 16:00	9.69	13.77	10.54	15.14
1/4/23 17:00	9.72	13.77	10.48	15.20
1/4/23 18:00	9.75	13.77	10.41	15.27
1/4/23 19:00	9.79	13.77	10.31	15.37
1/4/23 20:00	9.85	13.77	10.17	15.51
1/4/23 21:00	9.92	13.77	10.01	15.67
1/4/23 22:00	10.00	13.77	9.84	15.84

Date/Time	Average Hourly Pressure (psi) (847424)	Average Hourly Temperature (°C) (847424)	Average Hourly Depth To Water (ft) (847424)	Average Hourly Groundwater Elevation (feet NAVD88)
1/4/23 23:00	10.05	13.77	9.70	15.98
1/5/23 0:00	10.07	13.78	9.67	16.01
1/5/23 1:00	10.03	13.78	9.75	15.93
1/5/23 2:00	9.95	13.77	9.94	15.74
1/5/23 3:00	9.84	13.77	10.20	15.48
1/5/23 4:00	9.72	13.77	10.49	15.19
1/5/23 5:00	9.60	13.77	10.75	14.93
1/5/23 6:00	9.51	13.77	10.95	14.73
1/5/23 7:00	9.45	13.77	11.09	14.59
1/5/23 8:00	9.43	13.77	11.15	14.53
1/5/23 9:00	9.44	13.77	11.13	14.55
1/5/23 10:00	9.47	13.78	11.06	14.62
1/5/23 11:00	9.52	13.78	10.94	14.74
1/5/23 12:00	9.58	13.78	10.80	14.88
1/5/23 13:00	9.63	13.78	10.68	15.00
1/5/23 14:00	9.68	13.78	10.57	15.11
1/5/23 15:00	9.72	13.78	10.48	15.20
1/5/23 16:00	9.74	13.78	10.42	15.26
1/5/23 17:00	9.77	13.78	10.37	15.31
1/5/23 18:00	9.79	13.78	10.31	15.37
1/5/23 19:00	9.82	13.78	10.24	15.44
1/5/23 20:00	9.87	13.78	10.13	15.55
1/5/23 21:00	9.93	13.78	9.99	15.69
1/5/23 22:00	10.00	13.78	9.83	15.85
1/5/23 23:00	10.06	13.78	9.68	16.00
1/6/23 0:00	10.11	13.78	9.58	16.10
1/6/23 1:00	10.10	13.78	9.60	16.08
1/6/23 2:00	10.04	13.78	9.73	15.95
1/6/23 3:00	9.94	13.78	9.96	15.72
1/6/23 4:00	9.82	13.78	10.23	15.45
1/6/23 5:00	9.70	13.77	10.52	15.16
1/6/23 6:00	9.59	13.77	10.77	14.91
1/6/23 7:00	9.51	13.77	10.96	14.72
1/6/23 8:00	9.46	13.77	11.08	14.60
1/6/23 9:00	9.44	13.77	11.11	14.57
1/6/23 10:00	9.46	13.78	11.08	14.60
1/6/23 11:00	9.49	13.78	11.00	14.68
1/6/23 12:00	9.55	13.78	10.88	14.80
1/6/23 13:00	9.60	13.78	10.75	14.93
1/6/23 14:00	9.65	13.78	10.64	15.04
1/6/23 15:00	9.69	13.78	10.56	15.12
1/6/23 16:00	9.71	13.78	10.50	15.18
1/6/23 17:00	9.73	13.78	10.45	15.23
1/6/23 18:00	9.75	13.78	10.42	15.26
1/6/23 19:00	9.77	13.78	10.36	15.32
1/6/23 20:00	9.81	13.78	10.27	15.41
1/6/23 21:00	9.86	13.78	10.15	15.53
1/6/23 22:00	9.93	13.78	9.99	15.69

Date/Time	Average Hourly Pressure (psi) (847424)	Average Hourly Temperature (°C) (847424)	Average Hourly Depth To Water (ft) (847424)	Average Hourly Groundwater Elevation (feet NAVD88)
1/6/23 23:00	10.00	13.78	9.82	15.86
1/7/23 0:00	10.07	13.78	9.67	16.01
1/7/23 1:00	10.10	13.78	9.60	16.08
1/7/23 2:00	10.08	13.78	9.65	16.03
1/7/23 3:00	10.01	13.78	9.81	15.87
1/7/23 4:00	9.90	13.77	10.06	15.62
1/7/23 5:00	9.78	13.77	10.34	15.34
1/7/23 6:00	9.66	13.77	10.60	15.08
1/7/23 7:00	9.57	13.77	10.82	14.86
1/7/23 8:00	9.50	13.77	10.97	14.71
1/7/23 9:00	9.47	13.76	11.05	14.63
1/7/23 10:00	9.47	13.76	11.05	14.63
1/7/23 11:00	9.50	13.77	10.98	14.70
1/7/23 12:00	9.55	13.78	10.87	14.81
1/7/23 13:00	9.61	13.78	10.73	14.95
1/7/23 14:00	9.67	13.78	10.59	15.09
1/7/23 15:00	9.72	13.78	10.47	15.21
1/7/23 16:00	9.76	13.78	10.37	15.31
1/7/23 17:00	9.80	13.78	10.30	15.38
1/7/23 18:00	9.82	13.78	10.24	15.44
1/7/23 19:00	9.85	13.78	10.18	15.50
1/7/23 20:00	9.88	13.78	10.11	15.57
1/7/23 21:00	9.93	13.78	10.00	15.68
1/7/23 22:00	9.99	13.79	9.86	15.82
1/7/23 23:00	10.06	13.78	9.69	15.99
1/8/23 0:00	10.12	13.78	9.56	16.12

NBKK-S7-MW01

Date/Time	Average Hourly Pressure (psi) (691512)	Average Hourly Temperature (°C) (691512)	Average Hourly Depth To Water (ft) (691512)	Average Hourly Groundwater Elevation (feet NAVD88)
1/1/23 0:00	7.76	14.21	9.83	3.50
1/1/23 1:00	8.04	14.22	9.17	4.16
1/1/23 2:00	8.40	14.23	8.35	4.98
1/1/23 3:00	8.63	14.24	7.81	5.52
1/1/23 4:00	8.73	14.25	7.59	5.74
1/1/23 5:00	8.70	14.25	7.64	5.69
1/1/23 6:00	8.60	14.24	7.88	5.45
1/1/23 7:00	8.47	14.23	8.18	5.15
1/1/23 8:00	8.38	14.22	8.38	4.95
1/1/23 9:00	8.42	14.21	8.28	5.05
1/1/23 10:00	8.61	14.22	7.86	5.47
1/1/23 11:00	8.87	14.23	7.25	6.08
1/1/23 12:00	9.19	14.32	6.50	6.83
1/1/23 13:00	9.52	14.42	5.75	7.58
1/1/23 14:00	9.69	14.48	5.35	7.98
1/1/23 15:00	9.63	14.47	5.51	7.82
1/1/23 16:00	9.33	14.44	6.18	7.15
1/1/23 17:00	8.90	14.36	7.18	6.15
1/1/23 18:00	8.36	14.28	8.43	4.90
1/1/23 19:00	7.87	14.23	9.55	3.78
1/1/23 20:00	7.55	14.22	10.30	3.03
1/1/23 21:00	7.33	14.21	10.82	2.51
1/1/23 22:00	7.18	14.21	11.16	2.17
1/1/23 23:00	7.10	14.21	11.35	1.98
1/2/23 0:00	7.18	14.20	11.15	2.18
1/2/23 1:00	7.51	14.21	10.40	2.93
1/2/23 2:00	7.96	14.21	9.36	3.97
1/2/23 3:00	8.41	14.22	8.31	5.02
1/2/23 4:00	8.77	14.26	7.49	5.84
1/2/23 5:00	9.00	14.40	6.96	6.37
1/2/23 6:00	9.09	14.45	6.75	6.58
1/2/23 7:00	9.06	14.45	6.81	6.52
1/2/23 8:00	8.95	14.43	7.06	6.27
1/2/23 9:00	8.87	14.36	7.26	6.07
1/2/23 10:00	8.88	14.31	7.24	6.09
1/2/23 11:00	9.00	14.29	6.95	6.38
1/2/23 12:00	9.20	14.30	6.49	6.84
1/2/23 13:00	9.42	14.44	5.97	7.36
1/2/23 14:00	9.64	14.47	5.47	7.86
1/2/23 15:00	9.72	14.46	5.29	8.04
1/2/23 16:00	9.58	14.43	5.61	7.72
1/2/23 17:00	9.25	14.37	6.37	6.96
1/2/23 18:00	8.80	14.32	7.41	5.92
1/2/23 19:00	8.25	14.25	8.68	4.65
1/2/23 20:00	7.80	14.23	9.72	3.61
1/2/23 21:00	7.50	14.22	10.42	2.91
1/2/23 22:00	7.29	14.21	10.89	2.44

Date/Time	Average Hourly Pressure (psi) (691512)	Average Hourly Temperature (°C) (691512)	Average Hourly Depth To Water (ft) (691512)	Average Hourly Groundwater Elevation (feet NAVD88)
1/2/23 23:00	7.15	14.21	11.22	2.11
1/3/23 0:00	7.09	14.21	11.36	1.97
1/3/23 1:00	7.25	14.21	10.98	2.35
1/3/23 2:00	7.67	14.21	10.02	3.31
1/3/23 3:00	8.22	14.23	8.76	4.57
1/3/23 4:00	8.76	14.27	7.51	5.82
1/3/23 5:00	9.21	14.45	6.47	6.86
1/3/23 6:00	9.47	14.54	5.87	7.46
1/3/23 7:00	9.52	14.56	5.76	7.57
1/3/23 8:00	9.43	14.51	5.96	7.37
1/3/23 9:00	9.26	14.46	6.34	6.99
1/3/23 10:00	9.12	14.40	6.68	6.65
1/3/23 11:00	9.06	14.36	6.81	6.52
1/3/23 12:00	9.13	14.34	6.65	6.68
1/3/23 13:00	9.29	14.35	6.29	7.04
1/3/23 14:00	9.44	14.45	5.93	7.40
1/3/23 15:00	9.55	14.43	5.69	7.64
1/3/23 16:00	9.52	14.41	5.75	7.58
1/3/23 17:00	9.30	14.39	6.25	7.08
1/3/23 18:00	8.93	14.33	7.12	6.21
1/3/23 19:00	8.43	14.27	8.27	5.06
1/3/23 20:00	7.93	14.24	9.43	3.90
1/3/23 21:00	7.57	14.23	10.25	3.08
1/3/23 22:00	7.34	14.23	10.78	2.55
1/3/23 23:00	7.18	14.22	11.16	2.17
1/4/23 0:00	7.06	14.22	11.42	1.91
1/4/23 1:00	7.05	14.21	11.46	1.87
1/4/23 2:00	7.30	14.22	10.88	2.45
1/4/23 3:00	7.80	14.22	9.73	3.60
1/4/23 4:00	8.40	14.24	8.33	5.00
1/4/23 5:00	8.99	14.39	6.97	6.36
1/4/23 6:00	9.46	14.54	5.90	7.43
1/4/23 7:00	9.67	14.55	5.41	7.92
1/4/23 8:00	9.66	14.49	5.43	7.90
1/4/23 9:00	9.53	14.44	5.74	7.59
1/4/23 10:00	9.33	14.41	6.19	7.14
1/4/23 11:00	9.16	14.37	6.57	6.76
1/4/23 12:00	9.12	14.34	6.67	6.66
1/4/23 13:00	9.19	14.32	6.51	6.82
1/4/23 14:00	9.34	14.33	6.17	7.16
1/4/23 15:00	9.48	14.39	5.85	7.48
1/4/23 16:00	9.56	14.39	5.67	7.66
1/4/23 17:00	9.47	14.37	5.87	7.46
1/4/23 18:00	9.20	14.35	6.50	6.83
1/4/23 19:00	8.77	14.29	7.49	5.84
1/4/23 20:00	8.24	14.24	8.71	4.62
1/4/23 21:00	7.78	14.23	9.76	3.57
1/4/23 22:00	7.48	14.23	10.45	2.88

Date/Time	Average Hourly Pressure (psi) (691512)	Average Hourly Temperature (°C) (691512)	Average Hourly Depth To Water (ft) (691512)	Average Hourly Groundwater Elevation (feet NAVD88)
1/4/23 23:00	7.28	14.23	10.92	2.41
1/5/23 0:00	7.13	14.22	11.26	2.07
1/5/23 1:00	7.04	14.21	11.48	1.85
1/5/23 2:00	7.14	14.22	11.25	2.08
1/5/23 3:00	7.56	14.22	10.27	3.06
1/5/23 4:00	8.21	14.23	8.79	4.54
1/5/23 5:00	8.93	14.36	7.11	6.22
1/5/23 6:00	9.67	14.52	5.40	7.93
1/5/23 7:00	10.12	14.45	4.37	8.96
1/5/23 8:00	10.20	14.33	4.19	9.14
1/5/23 9:00	10.04	14.25	4.54	8.79
1/5/23 10:00	9.81	14.23	5.08	8.25
1/5/23 11:00	9.57	14.25	5.64	7.69
1/5/23 12:00	9.42	14.27	5.99	7.34
1/5/23 13:00	9.40	14.28	6.03	7.30
1/5/23 14:00	9.50	14.29	5.79	7.54
1/5/23 15:00	9.66	14.31	5.44	7.89
1/5/23 16:00	9.78	14.27	5.16	8.17
1/5/23 17:00	9.81	14.21	5.08	8.25
1/5/23 18:00	9.64	14.22	5.48	7.85
1/5/23 19:00	9.28	14.25	6.30	7.03
1/5/23 20:00	8.81	14.25	7.40	5.93
1/5/23 21:00	8.26	14.23	8.66	4.67
1/5/23 22:00	7.82	14.22	9.68	3.65
1/5/23 23:00	7.53	14.22	10.35	2.98
1/6/23 0:00	7.33	14.22	10.81	2.52
1/6/23 1:00	7.19	14.22	11.14	2.19
1/6/23 2:00	7.14	14.22	11.26	2.07
1/6/23 3:00	7.35	14.21	10.76	2.57
1/6/23 4:00	7.87	14.22	9.57	3.76
1/6/23 5:00	8.53	14.29	8.03	5.30
1/6/23 6:00	9.23	14.41	6.43	6.90
1/6/23 7:00	9.81	14.47	5.09	8.24
1/6/23 8:00	10.04	14.36	4.55	8.78
1/6/23 9:00	10.00	14.26	4.65	8.68
1/6/23 10:00	9.80	14.23	5.10	8.23
1/6/23 11:00	9.54	14.25	5.71	7.62
1/6/23 12:00	9.30	14.27	6.26	7.07
1/6/23 13:00	9.19	14.27	6.50	6.83
1/6/23 14:00	9.23	14.27	6.41	6.92
1/6/23 15:00	9.38	14.27	6.09	7.24
1/6/23 16:00	9.57	14.32	5.65	7.68
1/6/23 17:00	9.72	14.31	5.30	8.03
1/6/23 18:00	9.72	14.27	5.30	8.03
1/6/23 19:00	9.50	14.26	5.81	7.52
1/6/23 20:00	9.08	14.27	6.76	6.57
1/6/23 21:00	8.57	14.24	7.94	5.39
1/6/23 22:00	8.05	14.22	9.15	4.18

Date/Time	Average Hourly Pressure (psi) (691512)	Average Hourly Temperature (°C) (691512)	Average Hourly Depth To Water (ft) (691512)	Average Hourly Groundwater Elevation (feet NAVD88)
1/6/23 23:00	7.67	14.22	10.01	3.32
1/7/23 0:00	7.43	14.22	10.59	2.74
1/7/23 1:00	7.25	14.22	10.98	2.35
1/7/23 2:00	7.14	14.21	11.25	2.08
1/7/23 3:00	7.17	14.21	11.17	2.16
1/7/23 4:00	7.54	14.21	10.32	3.01
1/7/23 5:00	8.15	14.23	8.92	4.41
1/7/23 6:00	8.89	14.34	7.21	6.12
1/7/23 7:00	9.66	14.47	5.43	7.90
1/7/23 8:00	10.18	14.40	4.22	9.11
1/7/23 9:00	10.30	14.29	3.95	9.38
1/7/23 10:00	10.13	14.23	4.34	8.99
1/7/23 11:00	9.88	14.22	4.93	8.40
1/7/23 12:00	9.60	14.25	5.58	7.75
1/7/23 13:00	9.39	14.26	6.06	7.27
1/7/23 14:00	9.32	14.26	6.21	7.12
1/7/23 15:00	9.35	14.26	6.13	7.20
1/7/23 16:00	9.49	14.27	5.82	7.51
1/7/23 17:00	9.66	14.31	5.43	7.90
1/7/23 18:00	9.74	14.30	5.24	8.09
1/7/23 19:00	9.63	14.27	5.50	7.83
1/7/23 20:00	9.32	14.27	6.22	7.11
1/7/23 21:00	8.87	14.25	7.24	6.09
1/7/23 22:00	8.34	14.23	8.49	4.84
1/7/23 23:00	7.87	14.22	9.55	3.78
1/8/23 0:00	7.63	14.22	10.12	3.21

NBKK-S7-MW02

Date/Time	Average Hourly Pressure (psi) (862248)	Average Hourly Temperature (°C) (862248)	Average Hourly Depth To Water (ft) (862248)	Average Hourly Groundwater Elevation (feet NAVD88)
1/1/23 0:00	6.52	11.62	11.69	3.70
1/1/23 1:00	6.87	11.76	10.88	4.51
1/1/23 2:00	7.27	11.81	9.97	5.42
1/1/23 3:00	7.49	11.78	9.45	5.94
1/1/23 4:00	7.56	11.68	9.29	6.10
1/1/23 5:00	7.51	11.51	9.42	5.97
1/1/23 6:00	7.37	11.34	9.75	5.64
1/1/23 7:00	7.20	11.20	10.12	5.27
1/1/23 8:00	7.10	11.24	10.35	5.04
1/1/23 9:00	7.17	11.49	10.19	5.20
1/1/23 10:00	7.40	11.70	9.67	5.72
1/1/23 11:00	7.71	11.87	8.95	6.44
1/1/23 12:00	8.08	11.92	8.11	7.28
1/1/23 13:00	8.41	11.90	7.33	8.06
1/1/23 14:00	8.57	11.75	6.98	8.41
1/1/23 15:00	8.44	11.33	7.26	8.13
1/1/23 16:00	8.07	11.19	8.13	7.26
1/1/23 17:00	7.55	11.63	9.31	6.08
1/1/23 18:00	7.00	10.21	10.59	4.80
1/1/23 19:00	6.58	10.62	11.57	3.82
1/1/23 20:00	6.31	10.74	12.18	3.21
1/1/23 21:00	6.16	10.73	12.54	2.85
1/1/23 22:00	6.05	10.53	12.77	2.62
1/1/23 23:00	5.99	10.38	12.93	2.46
1/2/23 0:00	6.00	10.57	12.91	2.48
1/2/23 1:00	6.29	11.36	12.24	3.15
1/2/23 2:00	6.84	11.73	10.97	4.42
1/2/23 3:00	7.36	11.83	9.75	5.64
1/2/23 4:00	7.71	11.84	8.95	6.44
1/2/23 5:00	7.89	11.79	8.54	6.85
1/2/23 6:00	7.92	11.66	8.46	6.93
1/2/23 7:00	7.84	11.43	8.66	6.73
1/2/23 8:00	7.69	11.26	9.00	6.39
1/2/23 9:00	7.58	11.21	9.25	6.14
1/2/23 10:00	7.60	11.32	9.20	6.19
1/2/23 11:00	7.76	11.50	8.85	6.54
1/2/23 12:00	8.00	11.67	8.29	7.10
1/2/23 13:00	8.25	11.80	7.69	7.70
1/2/23 14:00	8.49	11.83	7.15	8.24
1/2/23 15:00	8.55	11.70	7.01	8.38
1/2/23 16:00	8.36	11.22	7.45	7.94
1/2/23 17:00	7.95	11.20	8.39	7.00
1/2/23 18:00	7.42	11.17	9.61	5.78
1/2/23 19:00	6.90	10.39	10.83	4.56
1/2/23 20:00	6.51	10.59	11.72	3.67
1/2/23 21:00	6.28	10.63	12.25	3.14
1/2/23 22:00	6.14	10.55	12.58	2.81

Date/Time	Average Hourly Pressure (psi) (862248)	Average Hourly Temperature (°C) (862248)	Average Hourly Depth To Water (ft) (862248)	Average Hourly Groundwater Elevation (feet NAVD88)
1/2/23 23:00	6.04	10.37	12.80	2.59
1/3/23 0:00	5.98	10.34	12.94	2.45
1/3/23 1:00	6.05	10.72	12.78	2.61
1/3/23 2:00	6.49	11.45	11.76	3.63
1/3/23 3:00	7.18	11.77	10.18	5.21
1/3/23 4:00	7.77	11.84	8.82	6.57
1/3/23 5:00	8.19	11.84	7.83	7.56
1/3/23 6:00	8.40	11.72	7.37	8.02
1/3/23 7:00	8.37	11.40	7.42	7.97
1/3/23 8:00	8.23	11.14	7.76	7.63
1/3/23 9:00	8.00	10.98	8.27	7.12
1/3/23 10:00	7.83	10.96	8.68	6.71
1/3/23 11:00	7.77	11.23	8.82	6.57
1/3/23 12:00	7.86	11.49	8.61	6.78
1/3/23 13:00	8.05	11.64	8.17	7.22
1/3/23 14:00	8.23	11.69	7.75	7.64
1/3/23 15:00	8.34	11.72	7.49	7.90
1/3/23 16:00	8.29	11.56	7.61	7.78
1/3/23 17:00	8.02	11.20	8.24	7.15
1/3/23 18:00	7.56	10.67	9.29	6.10
1/3/23 19:00	7.04	10.48	10.50	4.89
1/3/23 20:00	6.61	10.56	11.49	3.90
1/3/23 21:00	6.34	10.65	12.12	3.27
1/3/23 22:00	6.17	10.57	12.50	2.89
1/3/23 23:00	6.07	10.34	12.75	2.64
1/4/23 0:00	5.99	10.20	12.92	2.47
1/4/23 1:00	5.95	10.22	13.01	2.38
1/4/23 2:00	6.09	10.75	12.68	2.71
1/4/23 3:00	6.67	11.50	11.35	4.04
1/4/23 4:00	7.41	11.73	9.64	5.75
1/4/23 5:00	8.02	11.81	8.23	7.16
1/4/23 6:00	8.44	11.76	7.26	8.13
1/4/23 7:00	8.60	11.54	6.90	8.49
1/4/23 8:00	8.52	11.11	7.09	8.30
1/4/23 9:00	8.31	11.16	7.56	7.83
1/4/23 10:00	8.06	11.61	8.14	7.25
1/4/23 11:00	7.86	11.89	8.60	6.79
1/4/23 12:00	7.82	12.04	8.69	6.70
1/4/23 13:00	7.91	11.99	8.48	6.91
1/4/23 14:00	8.09	11.79	8.07	7.32
1/4/23 15:00	8.25	11.58	7.70	7.69
1/4/23 16:00	8.33	11.45	7.51	7.88
1/4/23 17:00	8.22	11.23	7.78	7.61
1/4/23 18:00	7.88	10.95	8.56	6.83
1/4/23 19:00	7.38	10.62	9.71	5.68
1/4/23 20:00	6.88	10.53	10.87	4.52
1/4/23 21:00	6.50	10.56	11.74	3.65
1/4/23 22:00	6.28	10.59	12.26	3.13

Date/Time	Average Hourly Pressure (psi) (862248)	Average Hourly Temperature (°C) (862248)	Average Hourly Depth To Water (ft) (862248)	Average Hourly Groundwater Elevation (feet NAVD88)
1/4/23 23:00	6.14	10.39	12.58	2.81
1/5/23 0:00	6.04	10.18	12.80	2.59
1/5/23 1:00	5.98	10.13	12.95	2.44
1/5/23 2:00	5.99	10.32	12.93	2.46
1/5/23 3:00	6.38	11.13	12.02	3.37
1/5/23 4:00	7.19	11.60	10.16	5.23
1/5/23 5:00	8.00	11.73	8.28	7.11
1/5/23 6:00	8.77	11.71	6.51	8.88
1/5/23 7:00	9.17	11.02	5.58	9.81
1/5/23 8:00	9.13	10.28	5.68	9.71
1/5/23 9:00	8.88	10.37	6.24	9.15
1/5/23 10:00	8.57	11.05	6.95	8.44
1/5/23 11:00	8.27	11.63	7.65	7.74
1/5/23 12:00	8.10	11.90	8.05	7.34
1/5/23 13:00	8.10	11.96	8.05	7.34
1/5/23 14:00	8.23	11.96	7.75	7.64
1/5/23 15:00	8.41	11.89	7.33	8.06
1/5/23 16:00	8.55	11.85	7.01	8.38
1/5/23 17:00	8.58	11.81	6.93	8.46
1/5/23 18:00	8.36	11.35	7.44	7.95
1/5/23 19:00	7.94	10.80	8.42	6.97
1/5/23 20:00	7.41	10.62	9.64	5.75
1/5/23 21:00	6.90	10.54	10.82	4.57
1/5/23 22:00	6.53	10.48	11.67	3.72
1/5/23 23:00	6.31	10.49	12.18	3.21
1/6/23 0:00	6.17	10.46	12.50	2.89
1/6/23 1:00	6.08	10.30	12.72	2.67
1/6/23 2:00	6.01	10.26	12.87	2.52
1/6/23 3:00	6.13	10.69	12.61	2.78
1/6/23 4:00	6.70	11.30	11.27	4.12
1/6/23 5:00	7.52	11.58	9.40	5.99
1/6/23 6:00	8.26	11.69	7.68	7.71
1/6/23 7:00	8.84	11.60	6.34	9.05
1/6/23 8:00	9.01	10.95	5.95	9.44
1/6/23 9:00	8.87	10.46	6.26	9.13
1/6/23 10:00	8.59	10.42	6.91	8.48
1/6/23 11:00	8.26	10.55	7.69	7.70
1/6/23 12:00	7.98	10.75	8.33	7.06
1/6/23 13:00	7.86	11.02	8.59	6.80
1/6/23 14:00	7.93	11.20	8.45	6.94
1/6/23 15:00	8.11	11.34	8.04	7.35
1/6/23 16:00	8.33	11.53	7.52	7.87
1/6/23 17:00	8.50	11.50	7.13	8.26
1/6/23 18:00	8.48	11.39	7.17	8.22
1/6/23 19:00	8.20	11.14	7.81	7.58
1/6/23 20:00	7.72	10.71	8.93	6.46
1/6/23 21:00	7.17	10.43	10.19	5.20
1/6/23 22:00	6.71	10.34	11.25	4.14

Date/Time	Average Hourly Pressure (psi) (862248)	Average Hourly Temperature (°C) (862248)	Average Hourly Depth To Water (ft) (862248)	Average Hourly Groundwater Elevation (feet NAVD88)
1/6/23 23:00	6.41	10.45	11.95	3.44
1/7/23 0:00	6.23	10.50	12.36	3.03
1/7/23 1:00	6.12	10.35	12.62	2.77
1/7/23 2:00	6.04	10.23	12.81	2.58
1/7/23 3:00	6.01	10.31	12.87	2.52
1/7/23 4:00	6.31	10.95	12.18	3.21
1/7/23 5:00	7.08	11.42	10.41	4.98
1/7/23 6:00	7.93	11.61	8.44	6.95
1/7/23 7:00	8.74	11.64	6.56	8.83
1/7/23 8:00	9.25	10.98	5.39	10.00
1/7/23 9:00	9.24	10.35	5.41	9.98
1/7/23 10:00	8.98	10.20	6.02	9.37
1/7/23 11:00	8.65	10.39	6.79	8.60
1/7/23 12:00	8.30	10.75	7.60	7.79
1/7/23 13:00	8.05	10.73	8.16	7.23
1/7/23 14:00	7.99	11.01	8.30	7.09
1/7/23 15:00	8.07	11.24	8.11	7.28
1/7/23 16:00	8.25	11.39	7.71	7.68
1/7/23 17:00	8.42	11.46	7.31	8.08
1/7/23 18:00	8.51	11.43	7.11	8.28
1/7/23 19:00	8.36	11.29	7.45	7.94
1/7/23 20:00	7.98	10.93	8.32	7.07
1/7/23 21:00	7.48	10.54	9.49	5.90
1/7/23 22:00	6.96	10.36	10.69	4.70
1/7/23 23:00	6.57	10.35	11.59	3.80
1/8/23 0:00	6.37	10.39	12.04	3.35

NBKK-S7-MW04

Date/Time	Average Hourly Pressure (psi) (836295)	Average Hourly Temperature (°C) (836295)	Average Hourly Depth To Water (ft) (836295)	Average Hourly Groundwater Elevation (feet NAVD88)
1/1/23 0:00	4.23	14.74	8.51	7.37
1/1/23 1:00	4.23	14.75	8.52	7.36
1/1/23 2:00	4.22	14.71	8.53	7.35
1/1/23 3:00	4.22	14.71	8.53	7.35
1/1/23 4:00	4.22	14.70	8.54	7.34
1/1/23 5:00	4.21	14.69	8.54	7.34
1/1/23 6:00	4.21	14.72	8.55	7.33
1/1/23 7:00	4.21	14.68	8.56	7.32
1/1/23 8:00	4.20	14.64	8.57	7.31
1/1/23 9:00	4.20	14.64	8.58	7.30
1/1/23 10:00	4.19	14.66	8.59	7.29
1/1/23 11:00	4.19	14.64	8.59	7.29
1/1/23 12:00	4.19	14.64	8.59	7.29
1/1/23 13:00	4.20	14.65	8.58	7.30
1/1/23 14:00	4.20	14.67	8.58	7.30
1/1/23 15:00	4.20	14.70	8.57	7.31
1/1/23 16:00	4.21	14.67	8.56	7.32
1/1/23 17:00	4.21	14.70	8.56	7.32
1/1/23 18:00	4.20	14.71	8.57	7.31
1/1/23 19:00	4.20	14.68	8.58	7.30
1/1/23 20:00	4.19	14.67	8.59	7.29
1/1/23 21:00	4.19	14.65	8.61	7.27
1/1/23 22:00	4.18	14.58	8.63	7.25
1/1/23 23:00	4.17	14.55	8.64	7.24
1/2/23 0:00	4.16	14.52	8.66	7.22
1/2/23 1:00	4.16	14.50	8.67	7.21
1/2/23 2:00	4.16	14.50	8.68	7.20
1/2/23 3:00	4.16	14.50	8.68	7.20
1/2/23 4:00	4.16	14.50	8.67	7.21
1/2/23 5:00	4.16	14.55	8.67	7.21
1/2/23 6:00	4.16	14.52	8.67	7.21
1/2/23 7:00	4.16	14.53	8.67	7.21
1/2/23 8:00	4.16	14.53	8.67	7.21
1/2/23 9:00	4.16	14.53	8.68	7.20
1/2/23 10:00	4.16	14.54	8.68	7.20
1/2/23 11:00	4.15	14.53	8.68	7.20
1/2/23 12:00	4.16	14.55	8.68	7.20
1/2/23 13:00	4.16	14.56	8.67	7.21
1/2/23 14:00	4.16	14.55	8.66	7.22
1/2/23 15:00	4.17	14.58	8.65	7.23
1/2/23 16:00	4.17	14.59	8.65	7.23
1/2/23 17:00	4.17	14.57	8.64	7.24
1/2/23 18:00	4.17	14.58	8.65	7.23
1/2/23 19:00	4.17	14.58	8.65	7.23
1/2/23 20:00	4.16	14.60	8.67	7.21
1/2/23 21:00	4.15	14.53	8.69	7.19
1/2/23 22:00	4.14	14.50	8.71	7.17

Date/Time	Average Hourly Pressure (psi) (836295)	Average Hourly Temperature (°C) (836295)	Average Hourly Depth To Water (ft) (836295)	Average Hourly Groundwater Elevation (feet NAVD88)
1/2/23 23:00	4.13	14.47	8.73	7.15
1/3/23 0:00	4.13	14.43	8.75	7.13
1/3/23 1:00	4.12	14.43	8.76	7.12
1/3/23 2:00	4.11	14.42	8.78	7.10
1/3/23 3:00	4.11	14.43	8.79	7.09
1/3/23 4:00	4.11	14.40	8.79	7.09
1/3/23 5:00	4.11	14.43	8.78	7.10
1/3/23 6:00	4.11	14.46	8.78	7.10
1/3/23 7:00	4.12	14.45	8.77	7.11
1/3/23 8:00	4.12	14.45	8.77	7.11
1/3/23 9:00	4.12	14.46	8.77	7.11
1/3/23 10:00	4.12	14.47	8.77	7.11
1/3/23 11:00	4.12	14.44	8.77	7.11
1/3/23 12:00	4.12	14.46	8.76	7.12
1/3/23 13:00	4.12	14.46	8.76	7.12
1/3/23 14:00	4.12	14.46	8.75	7.13
1/3/23 15:00	4.13	14.49	8.74	7.14
1/3/23 16:00	4.13	14.49	8.73	7.15
1/3/23 17:00	4.13	14.49	8.73	7.15
1/3/23 18:00	4.14	14.50	8.72	7.16
1/3/23 19:00	4.13	14.49	8.73	7.15
1/3/23 20:00	4.13	14.49	8.74	7.14
1/3/23 21:00	4.12	14.48	8.76	7.12
1/3/23 22:00	4.11	14.44	8.78	7.10
1/3/23 23:00	4.10	14.40	8.80	7.08
1/4/23 0:00	4.09	14.38	8.82	7.06
1/4/23 1:00	4.09	14.38	8.84	7.04
1/4/23 2:00	4.08	14.34	8.86	7.02
1/4/23 3:00	4.07	14.31	8.87	7.01
1/4/23 4:00	4.07	14.34	8.87	7.01
1/4/23 5:00	4.08	14.36	8.86	7.02
1/4/23 6:00	4.08	14.35	8.85	7.03
1/4/23 7:00	4.09	14.35	8.84	7.04
1/4/23 8:00	4.09	14.38	8.83	7.05
1/4/23 9:00	4.10	14.38	8.82	7.06
1/4/23 10:00	4.10	14.39	8.81	7.07
1/4/23 11:00	4.10	14.38	8.80	7.08
1/4/23 12:00	4.11	14.41	8.79	7.09
1/4/23 13:00	4.11	14.47	8.78	7.10
1/4/23 14:00	4.11	14.43	8.77	7.11
1/4/23 15:00	4.12	14.49	8.76	7.12
1/4/23 16:00	4.12	14.46	8.75	7.13
1/4/23 17:00	4.13	14.49	8.74	7.14
1/4/23 18:00	4.13	14.47	8.74	7.14
1/4/23 19:00	4.13	14.47	8.74	7.14
1/4/23 20:00	4.13	14.48	8.74	7.14
1/4/23 21:00	4.13	14.45	8.75	7.13
1/4/23 22:00	4.12	14.46	8.76	7.12

Date/Time	Average Hourly Pressure (psi) (836295)	Average Hourly Temperature (°C) (836295)	Average Hourly Depth To Water (ft) (836295)	Average Hourly Groundwater Elevation (feet NAVD88)
1/4/23 23:00	4.11	14.40	8.78	7.10
1/5/23 0:00	4.11	14.41	8.79	7.09
1/5/23 1:00	4.10	14.37	8.81	7.07
1/5/23 2:00	4.09	14.36	8.83	7.05
1/5/23 3:00	4.08	14.39	8.85	7.03
1/5/23 4:00	4.08	14.34	8.86	7.02
1/5/23 5:00	4.08	14.34	8.85	7.03
1/5/23 6:00	4.09	14.36	8.84	7.04
1/5/23 7:00	4.10	14.35	8.82	7.06
1/5/23 8:00	4.10	14.40	8.80	7.08
1/5/23 9:00	4.11	14.43	8.78	7.10
1/5/23 10:00	4.12	14.41	8.77	7.11
1/5/23 11:00	4.12	14.43	8.76	7.12
1/5/23 12:00	4.12	14.44	8.75	7.13
1/5/23 13:00	4.13	14.44	8.74	7.14
1/5/23 14:00	4.13	14.45	8.73	7.15
1/5/23 15:00	4.14	14.49	8.72	7.16
1/5/23 16:00	4.14	14.44	8.71	7.17
1/5/23 17:00	4.14	14.49	8.70	7.18
1/5/23 18:00	4.15	14.50	8.70	7.18
1/5/23 19:00	4.15	14.47	8.69	7.19
1/5/23 20:00	4.16	14.47	8.67	7.21
1/5/23 21:00	4.16	14.46	8.67	7.21
1/5/23 22:00	4.16	14.47	8.66	7.22
1/5/23 23:00	4.15	14.43	8.68	7.20
1/6/23 0:00	4.13	14.41	8.74	7.14
1/6/23 1:00	4.11	14.39	8.78	7.10
1/6/23 2:00	4.10	14.36	8.80	7.08
1/6/23 3:00	4.10	14.34	8.81	7.07
1/6/23 4:00	4.12	14.34	8.76	7.12
1/6/23 5:00	4.13	14.31	8.74	7.14
1/6/23 6:00	4.09	14.34	8.82	7.06
1/6/23 7:00	4.10	14.32	8.81	7.07
1/6/23 8:00	4.10	14.35	8.80	7.08
1/6/23 9:00	4.11	14.39	8.78	7.10
1/6/23 10:00	4.12	14.41	8.76	7.12
1/6/23 11:00	4.12	14.42	8.75	7.13
1/6/23 12:00	4.13	14.42	8.74	7.14
1/6/23 13:00	4.13	14.44	8.73	7.15
1/6/23 14:00	4.14	14.44	8.72	7.16
1/6/23 15:00	4.14	14.43	8.71	7.17
1/6/23 16:00	4.15	14.45	8.70	7.18
1/6/23 17:00	4.15	14.46	8.68	7.20
1/6/23 18:00	4.16	14.48	8.67	7.21
1/6/23 19:00	4.17	14.49	8.64	7.24
1/6/23 20:00	4.17	14.51	8.65	7.23
1/6/23 21:00	4.17	14.46	8.65	7.23
1/6/23 22:00	4.18	14.48	8.62	7.26

Date/Time	Average Hourly Pressure (psi) (836295)	Average Hourly Temperature (°C) (836295)	Average Hourly Depth To Water (ft) (836295)	Average Hourly Groundwater Elevation (feet NAVD88)
1/6/23 23:00	4.20	14.43	8.58	7.30
1/7/23 0:00	4.19	14.41	8.60	7.28
1/7/23 1:00	4.17	14.39	8.65	7.23
1/7/23 2:00	4.16	14.38	8.67	7.21
1/7/23 3:00	4.14	14.36	8.71	7.17
1/7/23 4:00	4.12	14.34	8.75	7.13
1/7/23 5:00	4.12	14.34	8.76	7.12
1/7/23 6:00	4.12	14.32	8.77	7.11
1/7/23 7:00	4.12	14.34	8.76	7.12
1/7/23 8:00	4.14	14.37	8.71	7.17
1/7/23 9:00	4.15	14.39	8.69	7.19
1/7/23 10:00	4.15	14.42	8.69	7.19
1/7/23 11:00	4.15	14.41	8.70	7.18
1/7/23 12:00	4.13	14.51	8.74	7.14
1/7/23 13:00	4.12	14.48	8.77	7.11
1/7/23 14:00	4.10	14.47	8.80	7.08
1/7/23 15:00	4.10	14.51	8.80	7.08
1/7/23 16:00	4.11	14.49	8.79	7.09
1/7/23 17:00	4.13	14.49	8.75	7.13
1/7/23 18:00	4.14	14.50	8.71	7.17
1/7/23 19:00	4.16	14.52	8.68	7.20
1/7/23 20:00	4.18	14.57	8.62	7.26
1/7/23 21:00	4.20	14.55	8.57	7.31
1/7/23 22:00	4.22	14.54	8.54	7.34
1/7/23 23:00	4.24	14.49	8.49	7.39
1/8/23 0:00	4.27	14.46	8.42	7.46

NBKK-S7-MW05

Date/Time	Average Hourly Pressure (psi) (952562)	Average Hourly Temperature (°C) (952562)	Average Hourly Depth To Water (ft) (952562)	Average Hourly Groundwater Elevation (feet NAVD88)
1/1/23 0:00	6.47	13.02	11.98	3.33
1/1/23 1:00	6.67	13.09	11.51	3.80
1/1/23 2:00	7.08	13.16	10.57	4.74
1/1/23 3:00	7.43	13.19	9.77	5.54
1/1/23 4:00	7.61	13.20	9.36	5.95
1/1/23 5:00	7.62	13.20	9.33	5.98
1/1/23 6:00	7.52	13.22	9.55	5.76
1/1/23 7:00	7.37	13.25	9.89	5.42
1/1/23 8:00	7.24	13.29	10.21	5.10
1/1/23 9:00	7.22	13.33	10.25	5.06
1/1/23 10:00	7.37	13.35	9.91	5.40
1/1/23 11:00	7.63	13.36	9.30	6.01
1/1/23 12:00	7.96	13.35	8.54	6.77
1/1/23 13:00	8.30	13.32	7.75	7.56
1/1/23 14:00	8.56	12.46	7.16	8.15
1/1/23 15:00	8.58	11.43	7.11	8.20
1/1/23 16:00	8.36	10.95	7.61	7.70
1/1/23 17:00	7.99	10.65	8.48	6.83
1/1/23 18:00	7.49	10.82	9.63	5.68
1/1/23 19:00	7.01	11.74	10.74	4.57
1/1/23 20:00	6.70	12.38	11.44	3.87
1/1/23 21:00	6.54	12.75	11.82	3.49
1/1/23 22:00	6.43	12.95	12.07	3.24
1/1/23 23:00	6.34	13.08	12.27	3.04
1/2/23 0:00	6.28	13.18	12.42	2.89
1/2/23 1:00	6.31	13.27	12.35	2.96
1/2/23 2:00	6.55	13.32	11.80	3.51
1/2/23 3:00	7.09	13.36	10.54	4.77
1/2/23 4:00	7.59	13.36	9.39	5.92
1/2/23 5:00	7.89	13.32	8.70	6.61
1/2/23 6:00	8.01	13.17	8.42	6.89
1/2/23 7:00	7.99	12.69	8.46	6.85
1/2/23 8:00	7.88	12.41	8.72	6.59
1/2/23 9:00	7.75	12.53	9.02	6.29
1/2/23 10:00	7.71	12.91	9.11	6.20
1/2/23 11:00	7.80	13.19	8.91	6.40
1/2/23 12:00	7.98	13.26	8.48	6.83
1/2/23 13:00	8.21	13.22	7.97	7.34
1/2/23 14:00	8.45	12.72	7.40	7.91
1/2/23 15:00	8.61	11.44	7.05	8.26
1/2/23 16:00	8.54	10.83	7.21	8.10
1/2/23 17:00	8.28	10.55	7.81	7.50
1/2/23 18:00	7.87	10.36	8.74	6.57
1/2/23 19:00	7.37	10.82	9.90	5.41
1/2/23 20:00	6.92	11.75	10.93	4.38
1/2/23 21:00	6.66	12.31	11.54	3.77
1/2/23 22:00	6.52	12.67	11.87	3.44

Date/Time	Average Hourly Pressure (psi) (952562)	Average Hourly Temperature (°C) (952562)	Average Hourly Depth To Water (ft) (952562)	Average Hourly Groundwater Elevation (feet NAVD88)
1/2/23 23:00	6.41	12.88	12.11	3.20
1/3/23 0:00	6.33	13.03	12.31	3.00
1/3/23 1:00	6.28	13.14	12.42	2.89
1/3/23 2:00	6.36	13.24	12.23	3.08
1/3/23 3:00	6.80	13.30	11.22	4.09
1/3/23 4:00	7.49	13.33	9.62	5.69
1/3/23 5:00	8.04	13.29	8.35	6.96
1/3/23 6:00	8.37	12.76	7.58	7.73
1/3/23 7:00	8.49	11.51	7.32	7.99
1/3/23 8:00	8.42	11.02	7.47	7.84
1/3/23 9:00	8.26	10.89	7.86	7.45
1/3/23 10:00	8.07	11.03	8.28	7.03
1/3/23 11:00	7.94	11.56	8.58	6.73
1/3/23 12:00	7.95	12.17	8.57	6.74
1/3/23 13:00	8.07	12.67	8.28	7.03
1/3/23 14:00	8.23	12.65	7.92	7.39
1/3/23 15:00	8.37	12.19	7.59	7.72
1/3/23 16:00	8.40	11.34	7.51	7.80
1/3/23 17:00	8.25	10.84	7.87	7.44
1/3/23 18:00	7.93	10.52	8.62	6.69
1/3/23 19:00	7.47	10.85	9.68	5.63
1/3/23 20:00	7.00	11.70	10.75	4.56
1/3/23 21:00	6.71	12.34	11.43	3.88
1/3/23 22:00	6.54	12.66	11.81	3.50
1/3/23 23:00	6.43	12.85	12.07	3.24
1/4/23 0:00	6.34	12.98	12.27	3.04
1/4/23 1:00	6.27	13.07	12.44	2.87
1/4/23 2:00	6.26	13.16	12.47	2.84
1/4/23 3:00	6.40	13.23	12.15	3.16
1/4/23 4:00	7.00	13.28	10.75	4.56
1/4/23 5:00	7.75	13.28	9.01	6.30
1/4/23 6:00	8.29	13.10	7.77	7.54
1/4/23 7:00	8.61	11.76	7.05	8.26
1/4/23 8:00	8.66	10.83	6.93	8.38
1/4/23 9:00	8.54	10.59	7.21	8.10
1/4/23 10:00	8.34	10.56	7.67	7.64
1/4/23 11:00	8.13	10.79	8.16	7.15
1/4/23 12:00	8.00	11.37	8.45	6.86
1/4/23 13:00	8.00	11.96	8.44	6.87
1/4/23 14:00	8.12	12.32	8.16	7.15
1/4/23 15:00	8.27	12.34	7.83	7.48
1/4/23 16:00	8.38	11.95	7.56	7.75
1/4/23 17:00	8.36	11.15	7.61	7.70
1/4/23 18:00	8.15	10.74	8.10	7.21
1/4/23 19:00	7.77	10.54	8.97	6.34
1/4/23 20:00	7.29	11.15	10.07	5.24
1/4/23 21:00	6.88	11.93	11.03	4.28
1/4/23 22:00	6.64	12.40	11.59	3.72

Date/Time	Average Hourly Pressure (psi) (952562)	Average Hourly Temperature (°C) (952562)	Average Hourly Depth To Water (ft) (952562)	Average Hourly Groundwater Elevation (feet NAVD88)
1/4/23 23:00	6.50	12.66	11.90	3.41
1/5/23 0:00	6.40	12.81	12.13	3.18
1/5/23 1:00	6.32	12.92	12.32	2.99
1/5/23 2:00	6.27	13.02	12.44	2.87
1/5/23 3:00	6.32	13.10	12.32	2.99
1/5/23 4:00	6.73	13.17	11.37	3.94
1/5/23 5:00	7.60	13.20	9.36	5.95
1/5/23 6:00	8.40	13.05	7.52	7.79
1/5/23 7:00	8.96	11.29	6.23	9.08
1/5/23 8:00	9.15	10.36	5.80	9.51
1/5/23 9:00	9.05	10.16	6.01	9.30
1/5/23 10:00	8.84	10.13	6.51	8.80
1/5/23 11:00	8.58	10.25	7.11	8.20
1/5/23 12:00	8.36	10.64	7.63	7.68
1/5/23 13:00	8.25	11.09	7.86	7.45
1/5/23 14:00	8.30	11.52	7.76	7.55
1/5/23 15:00	8.43	11.74	7.45	7.86
1/5/23 16:00	8.57	11.56	7.13	8.18
1/5/23 17:00	8.65	11.10	6.94	8.37
1/5/23 18:00	8.55	10.74	7.17	8.14
1/5/23 19:00	8.27	10.48	7.83	7.48
1/5/23 20:00	7.84	10.56	8.82	6.49
1/5/23 21:00	7.34	10.92	9.98	5.33
1/5/23 22:00	6.91	11.64	10.96	4.35
1/5/23 23:00	6.67	12.07	11.52	3.79
1/6/23 0:00	6.53	12.34	11.83	3.48
1/6/23 1:00	6.44	12.51	12.06	3.25
1/6/23 2:00	6.36	12.65	12.23	3.08
1/6/23 3:00	6.33	12.76	12.29	3.02
1/6/23 4:00	6.47	12.87	11.98	3.33
1/6/23 5:00	7.09	12.95	10.55	4.76
1/6/23 6:00	7.92	12.96	8.63	6.68
1/6/23 7:00	8.58	12.61	7.11	8.20
1/6/23 8:00	8.94	10.91	6.27	9.04
1/6/23 9:00	8.98	10.35	6.17	9.14
1/6/23 10:00	8.82	10.20	6.54	8.77
1/6/23 11:00	8.57	10.18	7.14	8.17
1/6/23 12:00	8.29	10.41	7.78	7.53
1/6/23 13:00	8.09	10.96	8.23	7.08
1/6/23 14:00	8.04	11.56	8.35	6.96
1/6/23 15:00	8.14	12.04	8.13	7.18
1/6/23 16:00	8.31	12.18	7.73	7.58
1/6/23 17:00	8.50	11.96	7.30	8.01
1/6/23 18:00	8.57	11.17	7.13	8.18
1/6/23 19:00	8.43	10.62	7.45	7.86
1/6/23 20:00	8.10	10.33	8.23	7.08
1/6/23 21:00	7.62	10.64	9.31	6.00
1/6/23 22:00	7.13	11.31	10.45	4.86

Date/Time	Average Hourly Pressure (psi) (952562)	Average Hourly Temperature (°C) (952562)	Average Hourly Depth To Water (ft) (952562)	Average Hourly Groundwater Elevation (feet NAVD88)
1/6/23 23:00	6.79	11.93	11.25	4.06
1/7/23 0:00	6.60	12.27	11.68	3.63
1/7/23 1:00	6.49	12.48	11.94	3.37
1/7/23 2:00	6.40	12.62	12.14	3.17
1/7/23 3:00	6.33	12.73	12.30	3.01
1/7/23 4:00	6.36	12.84	12.24	3.07
1/7/23 5:00	6.68	12.92	11.50	3.81
1/7/23 6:00	7.51	12.97	9.59	5.72
1/7/23 7:00	8.35	12.91	7.64	7.67
1/7/23 8:00	8.99	11.37	6.17	9.14
1/7/23 9:00	9.23	10.25	5.60	9.71
1/7/23 10:00	9.14	10.02	5.80	9.51
1/7/23 11:00	8.92	9.98	6.33	8.98
1/7/23 12:00	8.63	10.06	7.00	8.31
1/7/23 13:00	8.36	10.41	7.63	7.68
1/7/23 14:00	8.19	11.00	8.00	7.31
1/7/23 15:00	8.18	11.57	8.03	7.28
1/7/23 16:00	8.28	11.94	7.81	7.50
1/7/23 17:00	8.43	12.01	7.45	7.86
1/7/23 18:00	8.55	11.70	7.18	8.13
1/7/23 19:00	8.51	11.06	7.26	8.05
1/7/23 20:00	8.28	10.64	7.81	7.50
1/7/23 21:00	7.89	10.77	8.71	6.60
1/7/23 22:00	7.40	11.14	9.84	5.47
1/7/23 23:00	6.95	11.89	10.86	4.45
1/8/23 0:00	6.74	12.18	11.35	3.96

Appendix G
Survey Report

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JACOBS Surveying Services for

NAVAL BASE KITSAP (NBK) KEYPORT
Keyport, Washington
01/24/2023

Naval Facilities Engineering Command (NAVFAC), Southwest under the Comprehensive Long-term Environmental Action Navy (CLEAN) 9000 Contract, Contract Task Order (CTO) 4117, Contract Number N62470-16-D-9000.

JACOBS Project Manager: Dennis Ballam
JACOBS Professional Land Surveyor: Aaron Willis, PLS
JACOBS Project Surveyor: Roland "Duke" Brooks

SITE LOCATION AND DESCRIPTION

NBK Keyport occupies 340 acres (including tidelands) adjacent to the town of Keyport in Kitsap County, Washington, on a small peninsula on the east side of the central portion of Puget Sound. NBK Keyport, formerly known as Naval Undersea Warfare Center (NUWC) Keyport Division and Naval Sea Systems Command Keyport, is one of two active NUWCs for the Navy's Pacific Fleet. Surveying is required at the following sites:

- **Building 76 (Attachment A) –** Fire Station
- **2008 Car Fire (Attachment A) –** (Adjacent to Building 198)
- **Keyport Sludge Disposal Area (Attachment A) –** (OU 2/Area 5)
- **Building 1006 (Attachment B)**
- **Van Meter Road Spill/ Former Drum Storage Area (Attachment B) –** (OU 2/Area 2)
- **Keyport Peninsula Fill (Attachment C) –** (Site 7)
- **Landfill Extension (Attachment D) –** (Northeast Portion of Area 22)

PROJECT DESCRIPTION:

- Recover WSDOT and existing Base horizontal and vertical control monuments per site.
- Establish Primary Control.
- Survey locations of twenty-eight (28) new monitoring wells.

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ATTACHMENT A – Building 76, 2008 Car Fire, and Keyport Sludge Disposal Area

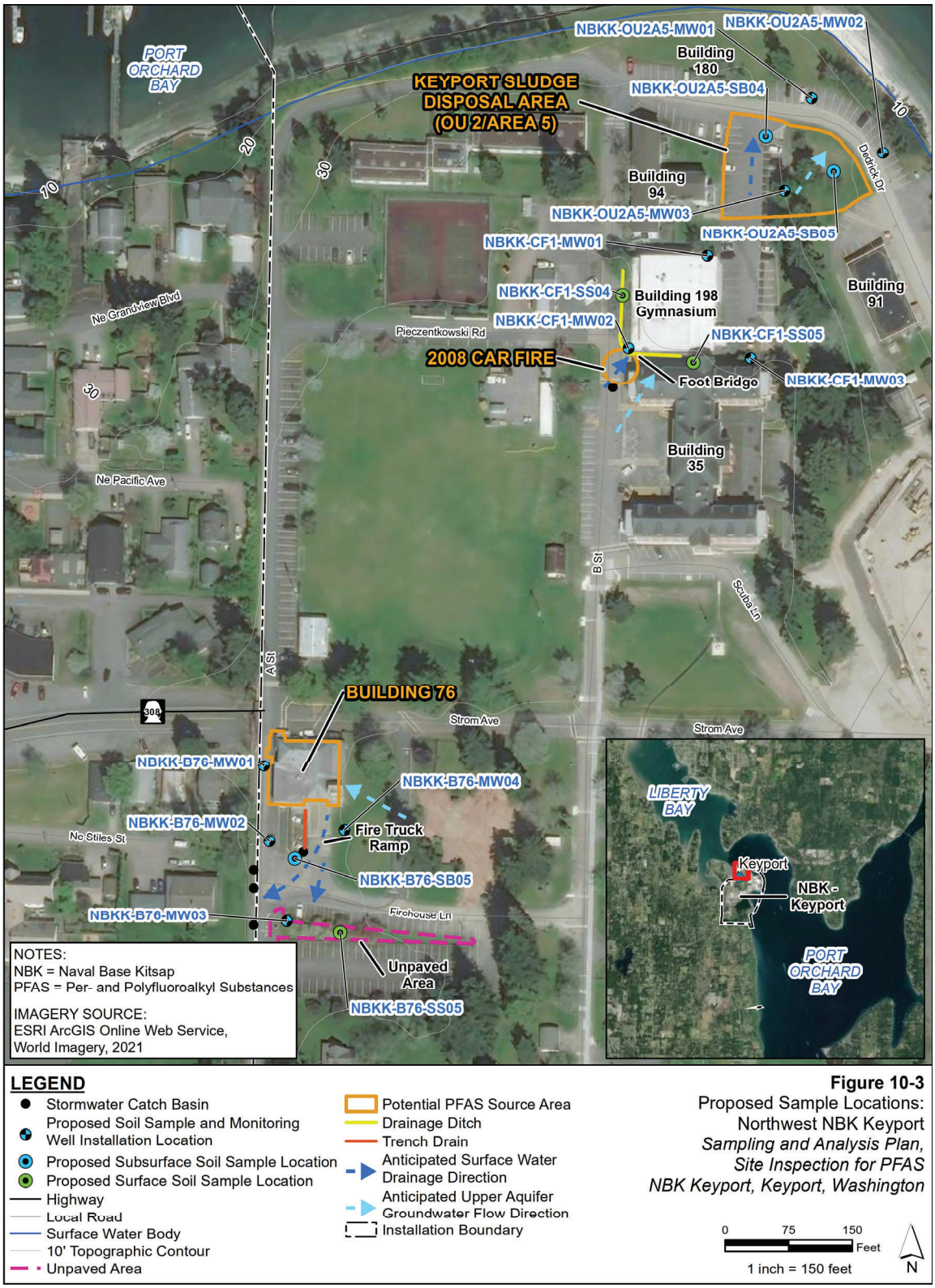

Figure 10-3
Proposed Sample Locations:
Northwest NBK Keyport
Sampling and Analysis Plan,
Site Inspection for PFAS
NBK Keyport, Keyport, Washington

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ATTACHMENT B – Building 1006 and Van Meter Road Spill / Former Drum Storage Area (OU 2/AREA 2)

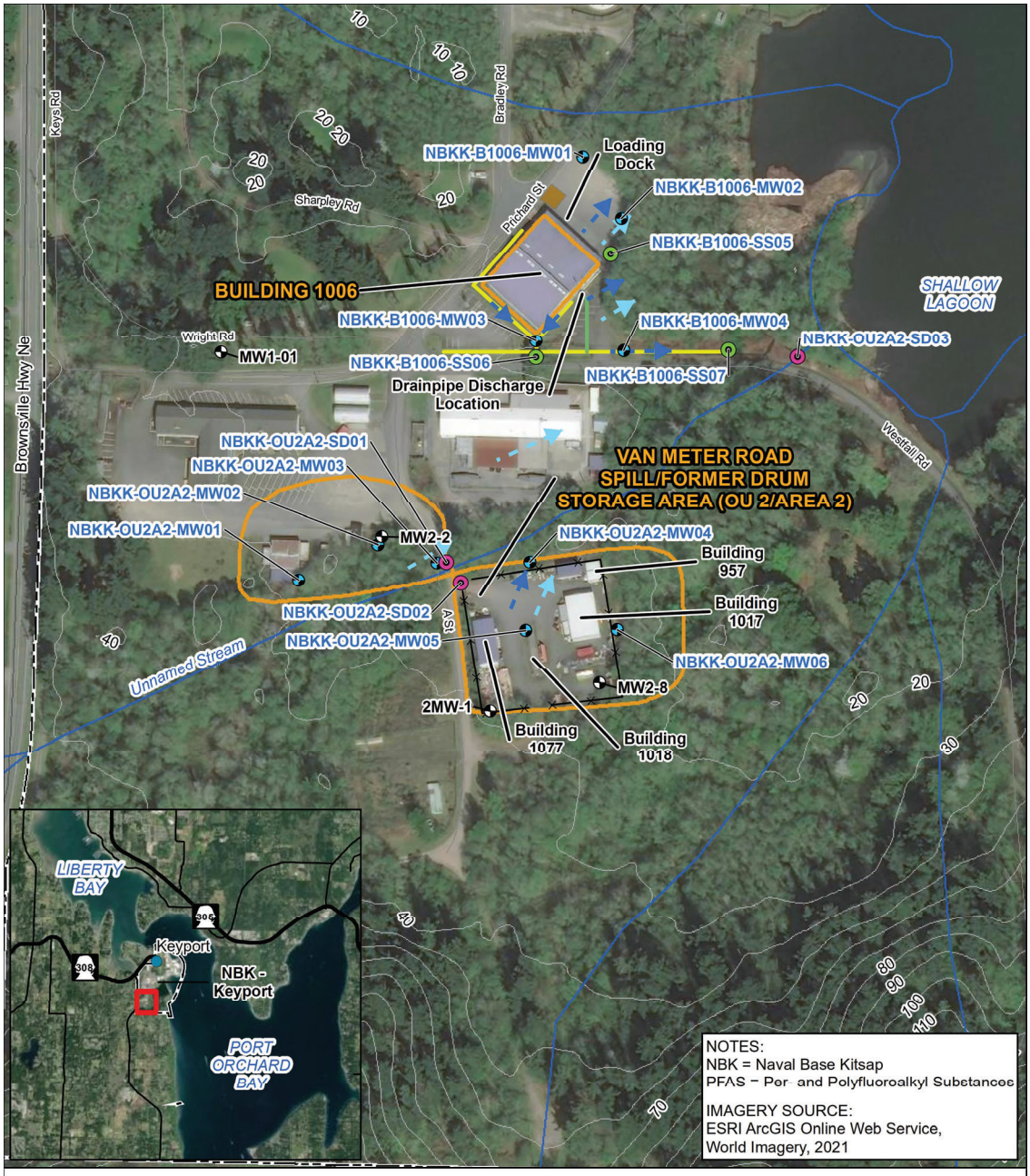

Figure 10-4
Proposed Sample Locations:
Southwest NBK Keyport
Sampling and Analysis Plan, Site Inspection for PFAS
NBK Keyport, Keyport, Washington

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ATTACHMENT C – Keyport Peninsula Fill (Site 7)

LEGEND

- Proposed Soil Sample and Monitoring Well Installation Location
- State Route
- Local Connecting Road
- Important Local Road
- Surface Water Body
- Potential PFAS Source Area
- Recommended for Remedial Investigation
- Demolished Pier
- 10' Topographic Contour
- Anticipated Surface Water Drainage Direction
- Anticipated Upper Aquifer Groundwater Flow Direction
- Installation Boundary

Figure 10-5
Proposed Sample Locations: East NBK Keyport
Sampling and Analysis Plan, Site Inspection for PFAS
NBK Keyport, Keyport, Washington

0 100 200 Feet
1 inch = 200 feet
N

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ATTACHMENT D – Landfill Extension (Northeast Portion of Area 22)

LEGEND

- Proposed Soil Sample and Monitoring Well Installation Location
- Local Road
- Anticipated Upper Aquifer Groundwater Flow Direction
- 10' Topographic Contour
- Potential PFAS Source Area
- Installation Boundary

NOTES:
NBK = Naval Base Kitsap
PFAS = Per- and Polyfluoroalkyl Substances

IMAGERY SOURCE:
ESRI ArcGIS Online Web Service, World Imagery, 2021

Figure 10-6
Proposed Sample Locations:
Central NBK Keyport
Sampling and Analysis Plan, Site Inspection for PFAS
NBK Keyport, Keyport, Washington

0 100 200 Feet
1 inch = 200 feet
N

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HORIZONTAL COORDINATE SYSTEMS DATUM:

The horizontal coordinate systems and datum used are the North American Datum of 1983, NAD83 (2011) Epoch 2010.00, in the Washington State Plane Coordinate System (SPCS), North Zone, U.S. Survey Feet.

VERTICAL DATUM:

The vertical datum is the North American Vertical Datum of 1988 (NAVD88) established using Geoid 18.

ACCURACY SPECIFICATIONS:

a. Horizontal control work complies with Second Order Class II (1:20,000) or better, as outlined in the **Federal Geospatial Data Committee (FGDC)** ***Geospatial Positioning Accuracy Standards, Part 4: Standards for Architecture, Engineering, Construction (A/E/C), and Facility Management*****.**

b. Vertical Control work complies with Second Order Class II (0.0350Vm) or better, as outlined in the FGDC ***Geospatial Positioning Accuracy Standards, Part 4: Standards for Architecture, Engineering, Construction (A/E/C) and Facility Management***.

METHODOLOGY:

Initial reconnaissance efforts were conducted to recover Washington Department of Transportation (WSDOT) and existing Base Control (per Survey Report by Bush, Roed & Hitchings Inc. Dated 08/02/22, Job No. 2014114.04) within the project site vicinity. The following published and established horizontal and vertical control were utilized in the GPS Static CORS Network Adjustment, RTK surveys having 2 occupations with a four-hour minimum satellite constellation difference, and differential leveling; Published and established primary control provided in **Table 1** and Published Data Sheet(s) provided **(Attachment E).** Primary Control locations are shown in **Figure 1**. Differential level notes **(Attachment G)**

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Table 1 – Primary Control

PID	*EASTING(USFT)*	*NORTHING(USFT)*	*ELEVATION(USFT)*	*PT DESCRIPTION*
GP18308-31	1198547.091	260301.136	13.064	Brass Disc
69	1200250.555	261504.257	47.782	5/8" Rebar & ST6 Cap
40	1199701.950	259039.380	15.800	Brass Disk in Mon Well
41	1199200.270	259878.720	18.700	Brass Disk in Mon Well
22	1199012.920	258176.765	27.538	Railroad Spike

Figure 1 – NBK Keyport Project Control Locations

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ATTACHMENT E

Washington State Department of Transportation

Geographic Services

SURVEY INFORMATION SYSTEM **Report of Survey Mark**

				ACCOUNTS INFORMATION		
Designation:	GP18308-31	**T.R.S:**	26N, 1E, 35	**BOOK**	**PROJECT**	**INVOICE**
Monument ID:	3180	**Corner Code:**		113	0L3073	23-97095
NGS Pid:		**State Route:**	308	224 / 233	MS5400	23-05032
State:	WASHINGTON	**Mile Post:**	3.1	NA	MT0319	23-11026
County:	KITSAP	**Station:**				
Region:	OL	**Offset:**				
Nearest Town:	KEYPORT	**Owner:**	GS			
USGS Quad:	POULSBO	**Bearing:**	M			

TO REACH THE STATION FROM THE JUNCTION OF SR 003 AND SR 308, GO EAST 2.8 MILES ALONG SR 308 TO A BRIDGE OVER A LAGOON AND MARK ON RIGHT. IT IS LOCATED JUST BEFORE KEYPORT, IN THE SOUTHEAST QUADRANT OF THE STRUCTURE, 80 CM @ 90 DEGREES FROM THE WEST CONCRETE BARRIER, 70 CM @ 0 DEGREES FROM THE SOUTH PAVEMENT SEAT, 2.6 METERS @ 30 DEGREES FROM A CATCH BASIN AND 1.6 METERS @ 50 DEGREES FROM AN ORANGE WITNESS POST. THE MARK IS A WSDOT BRASS DISK CEMENTED INTO A DRILL HOLE IN THE CONCRETE BRIDGE DECK WHICH IS SET 8 CM BELOW THE ASPHALT OVERLAY AND IS SURROUNDED BY A SHORT SECTION OF PVC PIPE.

Survey Control

Datum: NAD 83/11 **Date:** 01/12/2013

Lat: 47 41 58.129267 N **Long:** 122 37 40.557553 W **Ellips:** -18.806 (M) -61.699 (USFt) **Geoid:** -22.788 (M)

Washington State Plane Zone: North

Northing	Easting	Scale	Comb Factor	Conv Angle
79339.945 (M) 260301.136 (USFt)	365317.884 (M) 1198547.091 (USFt)	0.99996877	0.99997172	-1 20 10.0

Ortho: Date: 12/23/1997

Datum: NAVD 88

Elevation: 3.982 (M) 13.064 (USFt)

Survey Info	Accuracy	Network	Method
Horizontal	2 CM	PRIMARY	GPS
Ellips	5 CM		GPS
Ortho	1 CM	PRIMARY	DIFF LEVELS

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Datum: NAD 83/07 **Date:** 05/19/2008

Lat: 47 41 58.127830 N **Long:** 122 37 40.559618 W **Ellips:** -18.804 (M) -61.693 (USFt) **Geoid:** -22.786 (M)

Washington State Plane Zone: North

Northing	Easting	Scale	Comb Factor	Conv Angle
79339.902 (M) 260300.995 (USFt)	365317.840 (M) 1198546.947 (USFt)	0.99996877	0.99997172	-1 20 10.0

Ortho:	Date: 12/23/1997	Survey Info	Accuracy	Network	Method
Datum:	NAVD 88	Horizontal	2 CM	PRIMARY	GPS
Elevation:	3.982 (M) 13.064 (USFt)	Ellips	5 CM		GPS
		Ortho	1 CM	PRIMARY	DIFF LEVELS

Datum: NAD 83/91 **Date:** 12/23/1997

Lat: 47 41 58.125188 N **Long:** 122 37 40.561767 W **Ellips:** -18.605 (M) -61.040 (USFt) **Geoid:** -22.587 (M)

Washington State Plane Zone: North

Northing	Easting	Scale	Comb Factor	Conv Angle
79339.821 (M) 260300.729 (USFt)	365317.793 (M) 1198546.793 (USFt)	0.99996877	0.99997169	-1 20 10.0

Ortho:	Date: 12/23/1997	Survey Info	Accuracy	Network	Method
Datum:	NAVD 88	Horizontal	2 CM	PRIMARY	GPS
Elevation:	3.982 (M) 13.064 (USFt)	Ellips	5 CM		GPS
		Ortho	1 CM	PRIMARY	DIFF LEVELS

History

Recovered On	Recovered By	Action	Condition
1/15/2016	GEOGRAPHIC SERVICES	RECOVERED	GOOD
1/12/2013	GEOGRAPHIC SERVICES	UPDATED	
5/19/2008	GEOGRAPHIC SERVICES	UPDATED	
12/23/1997	GEOGRAPHIC SERVICES	MONUMENTED	

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BUILDING 76 LOCATION SURVEYS:

Building 76 consisted of four (4) monitoring wells that were located **(Attachment A)** with X, Y, & Z values**.** This data collection for X and Y values was conducted using Real-Time Kinematic (RTK) methods constraining to the primary control network shown in **Table 1**. The Z value locations are at the top of casing, north notch and was determined by differential leveling. The four (4) monitoring well locations are shown in **Table 2**.

Table 2- Building 76 Monitoring Wells

PT ID	*EASTING (USFT)*	*NORTHING (USFT)*	*Elevation (USFT)*	*Description*
NBKK-B76-MW01 (BPL 420)	1199875.242	261339.102	44.351	MW01-TOP LID_Horz. & TOP CASING_vert. (Flush Mount)
GROUND	1199875.311	261340.015	44.604	MW01-CONCRETE NORTH
NBKK-B76-MW02 (BPL 421)	1199872.443	261247.384	43.161	MW02-TOP LID_Horz. & TOP CASING_vert. (Flush Mount)
GROUND	1199872.444	261248.423	43.450	MW02-CONCRETE NORTH
NBKK-B76-MW03 (BPL 422)	1199937.495	261166.977	45.1541	MW03-TOP LID_Horz. & TOP CASING_vert. (Flush Mount)
GROUND	1199937.584	261167.946	45.445	MW03-CONCRETE NORTH
NBKK-B76-MWO4 (BPL 423)	1199993.491	261258.277	52.873	MW04-TOP LID_Horz. & TOP CASING_vert. (Flush Mount)
GROUND	1199993.089	261260.015	53.107	MW04-GROUND NORTH

2008 CAR FIRE LOCATION SURVEYS:

2008 Car Fire consisted of three (3) monitoring wells that were located **(Attachment A)** with X, Y, & Z values**.** This data collection for X and Y values was conducted using Real-Time Kinematic (RTK) methods constraining to the primary control network shown in **Table 1**. The Z value locations are at the top of casing, north notch and was determined by differential leveling. The three (3) monitoring well locations are shown in **Table 3**.

Table 3- 2008 Car Fire Monitoring Wells

PT ID	*EASTING (USFT)*	*NORTHING (USFT)*	*Elevation (USFT)*	*Description*
NBKK-CF1-MW01 (BPK 462)	1200393.178	261941.087	34.898	MW01-TOP LID_Horz. & TOP CASING_vert. (Flush Mount)
GROUND	1200393.692	261942.728	34.907	MW01-GROUND NORTH
NBKK-CF1-MW02 (BPK 470)	1200331.885	261803.493	42.797	MW02-TOP LID_Horz. & TOP CASING_vert. (Flush Mount)
GROUND	1200331.779	261804.623	43.118	MW02-GROUND NORTH
NBKK-CF1-MW03 (BPK 463)	1200465.528	261829.664	36.503	MW03-TOP LID_Horz. & TOP CASING_vert. (Flush Mount)
GROUND	1200465.675	261830.844	36.810	MW03-ASPHALT NORTH

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KEYPORT SLUDGE DISPOSAL AREA (OU 2/AREA 5) LOCATION SURVEYS:

Keyport Sludge Disposal Area consisted of three (3) monitoring wells that were located **(Attachment A)** with X, Y, & Z values**.** This data collection for X and Y values was conducted using Real-Time Kinematic (RTK) methods constraining to the primary control network shown in **Table 1**. The Z value locations are at the top of casing, north notch and was determined by differential leveling. The three (3) monitoring well locations are shown in **Table 4**.

Table 4- Keyport Sludge Disposal Area Monitoring Wells

PT ID	*EASTING (USFT)*	*NORTHING (USFT)*	*Elevation (USFT)*	*Description*
NBKK-OU2A5-MW01 (BPK 469)	1200526.773	262157.070	21.441	MW01-TOP LID_Horz. & TOP CASING_vert. (Flush Mount)
GROUND	1200526.909	262158.795	21.703	MW01-GROUND NORTH
NBKK-OU2A5-MW02 (BPK 468)	1200606.002	262048.655	18.059	MW02-TOP LID_Horz. & TOP CASING_vert. (Flush Mount)
GROUND	1200606.324	262049.390	18.503	MW02-ASPHALT NORTH
NBKK-OU2A5-MW03 (BPL 424)	1200537.186	261997.869	25.681	MW03-TOP LID_Horz. & TOP CASING_vert. (Flush Mount)
GROUND	1200537.263	261999.781	26.173	MW03-GROUND NORTH

BUILDING 1006 LOCATION SURVEYS:

Building 1006 consisted of four (4) monitoring wells that were located **(Attachment B)** with X, Y, & Z values**.** This data collection for X and Y values was conducted using Real-Time Kinematic (RTK) methods constraining to the primary control network shown in **Table 1**. The Z value locations are at the top of casing, north notch and was determined by differential leveling. The four (4) monitoring well locations are shown in **Table 5**.

Table 5- Building 1006 Monitoring Wells

PT ID	*EASTING (USFT)*	*NORTHING (USFT)*	*Elevation (USFT)*	*Description*
NBKK-B1006-MW01 (BPK 459)	1199301.965	258601.174	13.376	MW01-TOP LID_Horz. & TOP CASING_vert. (Flush Mount)
GROUND	1199302.932	258602.215	13.821	MW01-ASPHALT NORTH
NBKK-B1006-MW02 (BPK 460)	1199373.561	258531.353	12.335	MW02-TOP LID_Horz. & TOP CASING_vert. (Flush Mount)
GROUND	1199374.689	258532.209	12.651	MW02-ASPHALT NORTH
NBKK-B1006-MW03 (BPK 461)	1199277.605	258378.490	17.866	MW03-TOP LID_Horz. & TOP CASING_vert. (Flush Mount)
GROUND	1199278.746	258379.960	18.138	MW03-GROUND NORTH
NBKK-B1006-MWO4 (BPK 471)	1199351.393	258348.701	15.217	MW04-TOP LID_Horz. & TOP CASING_vert. (Flush Mount)
GROUND	1199351.244	258349.972	15.753	MW04-GROUND NORTH

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VAN METER ROAD SPILL (OU 2/AREA 2) LOCATION SURVEYS:

Van Meter Road Spill area consisted of six (6) monitoring wells that were located **(Attachment B)** with X, Y, & Z values**.** This data collection for X and Y values was conducted using Real-Time Kinematic (RTK) methods constraining to the primary control network shown in **Table 1**. The Z value locations are at the top of casing, north notch and was determined by differential leveling. The six (6) monitoring well locations are shown in **Table 6**.

Table 6- Van Meter Road Spill Monitoring Wells

PT ID	*EASTING (USFT)*	*NORTHING (USFT)*	*Elevation (USFT)*	*Description*
NBKK-OU2A2-MW01 (BPK 401)	1198880.934	257991.875	28.150	MW01-TOP LID_Horz. & TOP CASING_vert. (Flush Mount)
GROUND	1198880.827	257993.303	28.392	MW01-ASPHALT NORTH
NBKK-OU2A2-MW02 (BPK 472)	1199013.511	258065.55	27.264	MW02-TOP LID_Horz. & TOP CASING_vert. (Stand Up)
GROUND	1199013.258	258067.347	25.422	MW02-GROUND NORTH
NBKK-OU2A2-MW03 (BPK 473)	1199068.932	258060.347	23.184	MW03-TOP LID_Horz. & TOP CASING_vert. (Flush Mount)
GROUND	1199068.256	258061.590	23.600	MW03-GROUND NORTH
NBKK-OU2A2-MW04 (BPK 403)	1199201.503	257985.515	23.658	MW04-TOP LID_Horz. & TOP CASING_vert. (Flush Mount)
GROUND	1199201.303	257987.005	23.983	MW04-ASPHALT NORTH
NBKK-OU2A2-MW05 (BPK 402)	1199205.128	257920.781	24.526	MW05-TOP LID_Horz. & TOP CASING_vert. (Flush Mount)
GROUND	1199204.816	257922.182	24.895	MW05-ASPHALT NORTH
NBKK-OU2A2-MW06 (BPK 404)	1199359.411	257939.126	23.212	MW06-TOP LID_Horz. & TOP CASING_vert. (Stand Up)
GROUND	1199359.372	257941.061	20.929	MW06-GROUND NORTH

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KEYPORT PENINSULA FILL (SITE 7) LOCATION SURVEYS:

Keyport Peninsula Fill area consisted of four (4) monitoring wells that were located **(Attachment C)** with X, Y, & Z values**.** This data collection for X and Y values was conducted using Real-Time Kinematic (RTK) methods constraining to the primary control network shown in **Table 1**. The Z value locations are at the top of casing, north notch and was determined by differential leveling. The four (4) monitoring well locations are shown in **Table 7**.

Table 7- Keyport Peninsula Fill Monitoring Wells

PT ID	*EASTING (USFT)*	*NORTHING (USFT)*	*Elevation (USFT)*	*Description*
NBKK-S7-MW01 (BPK 467)	1201288.027	261189.114	13.326	MW01-TOP LID_Horz. & TOP CASING_vert. (Flush Mount)
GROUND	1201288.031	261190.193	13.693	MW01-ASPHALT NORTH
NBKK-S7-MW02	1201697.479	261188.699	15.388	MW02-TOP LID_Horz. & TOP CASING_vert. (Flush Mount)
GROUND	1201697.858	261189.822	15.541	MW02-GROUND NORTH
NBKK-S7-MW04 (BPK 464)	1201287.800	260906.724	15.884	MW04-TOP LID_Horz. & TOP CASING_vert. (Flush Mount)
GROUND	1201287.789	260907.809	16.076	MW04-ASPHALT NORTH
NBKK-S7-MWO5 (BPK 465)	1201900.370	260890.158	15.306	MW05-TOP LID_Horz. & TOP CASING_vert. (Flush Mount)
GROUND	1201900.553	260891.210	15.677	MW05-ASPHALT NORTH

LANDFILL EXTENSION LOCATION SURVEYS:

Landfill Extension area consisted of four (4) monitoring wells that were located **(Attachment D)** with X, Y, & Z values**.** This data collection for X and Y values was conducted using Real-Time Kinematic (RTK) methods constraining to the primary control network shown in **Table 1**. The Z value locations are at the top of casing, north notch and was determined by differential leveling. The four (4) monitoring well locations are shown in **Table 8**.

Table 8- Landfill Extension Monitoring Wells

PT ID	*EASTING (USFT)*	*NORTHING (USFT)*	*Elevation (USFT)*	*Description*
NBKK-LFEX-MW01 (BPK 457)	1199596.280	260152.474	24.101	MW01-TOP LID_Horz. & TOP CASING_vert. (Flush Mount)
GROUND	1199596.342	260153.833	24.548	MW01-GROUND NORTH
NBKK-LFEX-MW02 (BPK 456)	1199382.734	259980.324	21.604	MW02-TOP LID_Horz. & TOP CASING_vert. (Flush Mount)
GROUND	1199382.754	259981.735	21.978	MW02-GROUND NORTH
NBKK-LFEX-MW03 (BPK 455)	1199545.803	259906.273	19.728	MW03-TOP LID_Horz. & TOP CASING_vert. (Flush Mount)
GROUND	1199545.774	259907.682	20.129	MW03-ASPHALT NORTH
NBKK-LFEX-MW04 (BPK 458)	1199818.015	259915.48	23.024	MW04-TOP LID_Horz. & TOP CASING_vert. (Flush Mount)
GROUND	1199817.975	259916.907	23.268	MW04-GROUND NORTH

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QUALITY ASSURANCE/QUALITY CONTROL (QA/QC):

The procedures, methodology and techniques implemented throughout the field campaign and processing of the survey data, provided high-level precision and accuracy. Using RTK surveys, check shots were collected on published control points **(Attachment F)** prior to commencing with data collection and post data collection of the monitoring wells to verify values were consistent throughout the time frame of each survey. Differential level loops were utilized to obtain Z values on monitoring wells **(Attachment G)**.

SURVEY'S CERTIFICATION:

I, Aaron Willis, Professional Land Surveyor licensed in the State of Washington, hereby certify that the data acquisition, analysis, computations, and other information contained in this document are true, accurate, compliant with the scope of work and were performed under my direct supervision. The accuracy of the control and the features surveyed have met or exceeded (are better than) the accuracy requirements stated within the statement of work for Naval Base Kitsap (NBK) Keyport.

Aaron D. Willis
Professional Land Surveyor
Washington License No. 50991 (expires 1/29/2025)

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ATTACHMENT F – RTK CHECKS, CONTROL COMPARISON

Control Basis: Primary Control Point 69 (Shown in Table 1)

PT ID	Northing	Easting	Elevation
69	261504.257	1200250.555	47.782

Survey Deltas_Primary Control Check_Occupying Control Point 69

PT ID	Northing	Easting	Elevation		Δy	Δx	Δz
6	261217.874	1201486.970	13.710	CK 6 AM	-0.011	0.003	-0.005
6	261217.897	1201486.963	13.721	CK 6 PM	0.011	-0.004	0.005
41	259878.666	1199200.255	18.677	CK 41 AM	0.054	0.015	0.023
41	259878.649	1199200.263	18.692	CK 41 PM	0.071	0.007	0.008
40	259039.333	1199701.878	15.793	CK 40 AM	0.047	0.072	0.007
40	259039.349	1199701.905	15.807	CK 40 PM	0.031	0.045	-0.007

Survey Deltas_Primary Control Check_Occupying Control Point 41

					Δy	Δx	Δz
22	258176.806	1199012.922	27.551	CK 22	-0.041	-0.002	-0.013

Survey Deltas_Existing Well Check_Record (R) Vs Measured (M)

EX-MW-48 TOC (R)	259416.030	1199082.010	15.800		Δy	Δx	Δz
EX-MW-48 TOC (M)	259416.060	1199081.982	15.758		-0.030	0.028	0.042
EX-MW-71 TOC (R)	259491.301	1199038.051	16.600		Δy	Δx	Δz
EX-MW-71 TOC (M)	259491.254	1199037.980	16.547		0.047	0.071	0.053

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ATTACHMENT G – Differential Level Field Notes

STA	+	HI	−	ROD	ELEV
69					47.782
	5.4180	53.2000			
69A			4.8374		48.9626
	JK	SETUP			
	4.0680	53.0506			
69			5.2501		47.7805
—	—	—	—	—	—
CP41-EX					18.70
	6.4229	25.1229			
			6.1770		18.9459
	JK	SETUP			
	6.0961	25.0359			
CP41-EX			6.3360		18.6999

KEYPORT LEVELS (LL1) (16)

5/8" RBR & STG CONTROL 1/22/23 RB/JH

TBM COR CONC LIGHT BASE ☐ TBM

MAG NAIL

STA	+	HI	−	ROD	ELEV
69A					48.9626
	2.8725	51.8351			
TP-1			6.4559		
	4.5021	49.8773			
RS-1				6.7022	43.1751
TP2			7.0795		42.7978
	2.1855	44.9833			
RS-2				8.1483	36.8350
TP 3			8.4797		36.5036
	4.3480	40.8516			
RS-3				5.7165	35.0851
~~RS-3~~					
RS-4				5.9536	34.8980
TP4			7.3388		33.5128
	1.8613	35.3741			
RS-5				9.1504	26.2237
RS-6				9.6930	25.6811
TP-5			5.9012		29.4729
	0.7598	30.2327			
RS-7				8.4326	21.8001
TP-TOC			8.7914		
	4.6541	26.0954			
RS-8				7.6554	18.4600
TP-TOC			8.0363		18.0591

KEYPORT LEVELS - SITE OUZA5 & CF1 (LL3) (17)

TBM

T-PLATE

TOL - NBKK - CF1 - MW02
TOC - NBKK - CF1 - MW02

TOL - NBKK - CF1 - MW03
TOC - NBKK - CF1 - MW03

TOL - NBKK - CF1 - MW01

TOC - NBKK - CF1 - MW01
T-PLATE

TOL - NBKK - OUZA5 - MW03
TOC - NBKK - OUZA5 - MW03
T-PLATE

TOL - NBKK - OUZA5 - MW01
TOC - NBKK - OUZA5 - MW01

TOL - NBKK - OUZA5 - MW02 (BPK 468)
TOC - NBKK - OUZA5 - MW02

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STA	+	HI	—	ROD	ELEV
	JX SETUP				
	8.0002	26.0593			
TP-TOC			4.6198		21.4395
	9.7020	31.1415			
TP7			0.4926		30.6489
	4.3633	35.0122			
RS-9				9.3337	25.6985
TP8			1.3854		33.7568
	7.2658	41.0226			
RS-10				6.1364	34.8862
TP-TOC			4.5236		36.4990
	8.3576	44.8566			
TP-TOC			2.0609		42.7957
	7.0495	49.8452			
TP9			4.4925		45.3527
	5.9839	51.3366			
69A			2.3734		48.9632

(18)

KEYPORT LEVELS SITE 002A5 & CF1 (LC3-CONT)

TOC-NBKK-002A5-MW01 (BPK 469)

T-PLATE

TOC-NBKK-002A5-MW03 (BPL 424)
T-PLATE

TOC-NBKK-CF1-MW01 (BPK 462)
TOC-NBKK-CF1-MW03 (BPK 463)

TOC-NBKK-CF1-MW02 (BPK 470)

T-PLATE

STA	+	HI	—	ROD	ELEV
69A					48.9626
	7.0587	56.0213			
TP-1			5.6657		50.3556
	8.2760	58.6316			
RS-1				5.4403	53.1913
RS-2				5.2582	52.8734
TP-2			4.5794		54.0522
	1.2627	55.3149			
TP 3			8.6360		46.6789
	1.9123	48.5912			
RS-3				3.1486	45.4426
RS-4				3.4371	45.1541
TP-TOC			5.4302		43.1610
RS-5				5.1622	43.4290
	6.2965	49.4575			
RS-6				4.8723	44.5852
TP-TOC			5.1064		44.3511
	JX SETUP				
	5.0297	49.3808			
TP-TOC			6.2204		43.1604
				3.3245	45.1534
	5.3174	48.4778			
TP			1.7969		46.6809
	7.9302	54.6111			

(19)

KEYPORT LEVELS SITE B76 (LC4)

TBM FROM 69

T-PLATE

TOL-NBKK-B76-MW04 (BPL 423)
TOC-NBKK-B76-MW04
T-PLATE

T-PLATE

TOL-NBKK-B76-MW03 (BPL 422)
TOC-NBKK-B76-MW03
TOC-NBKK-B76-MW02 (BPL-421)
TOL-NBKK-B76-MW02

TOL-NBKK-B76-MW01 (BPL-420)
TOC-NBKK-B76-MW01

TOC-NBKK-MW02
TOC-NBKK-B76-MW03

T-PLATE

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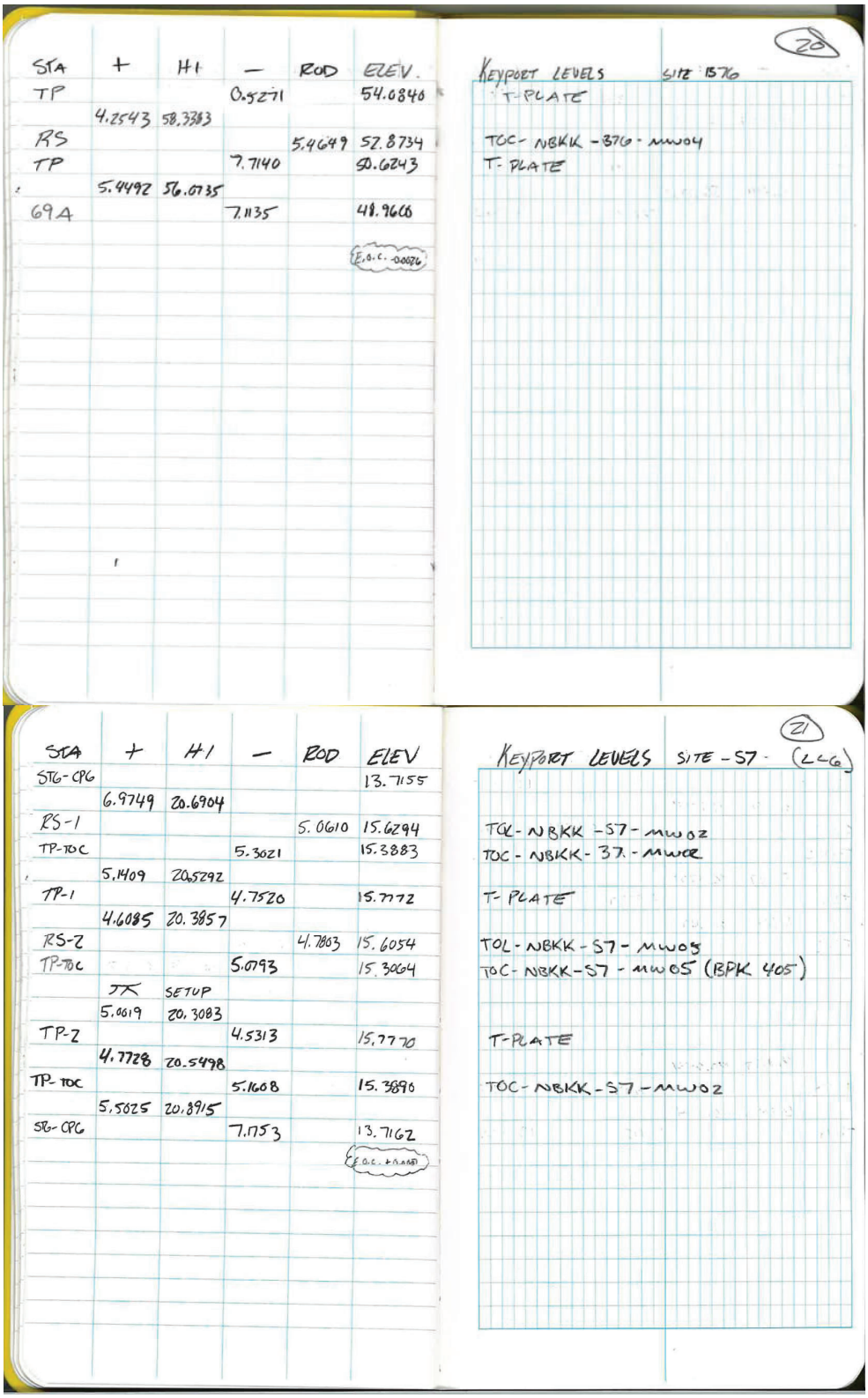

STA	+	HI	−	ROD	ELEV.
TP			0.5271		54.0840
	4.2543	58.3383			
RS				5.4649	52.8734
TP			7.7140		50.6243
	5.4492	56.0735			
69A			7.1135		48.9600

E.O.C. -0.0026

20

KEYPORT LEVELS SITE 1576

T-PLATE

TOC- NBKK -376 - MW04
T- PLATE

STA	+	HI	−	ROD	ELEV
STG-CPG					13.7155
	6.9749	20.6904			
RS-1				5.0610	15.6294
TP-TOC			5.3021		15.3883
	5.1409	20.5292			
TP-1			4.7520		15.7772
	4.6085	20.3857			
RS-2				4.7803	15.6054
TP-TOC			5.0793		15.3064
	JX	SETUP			
	5.0619	20.3083			
TP-2			4.5313		15.7770
	4.7728	20.5498			
TP-TOC			5.1608		15.3890
	5.5025	20.8915			
STG-CPG			7.1753		13.7162

E.O.C. +0.0007

21

KEYPORT LEVELS SITE - S7 - (LLG)

TOL- NBKK -S7- MW02
TOC - NBKK- 37 - MW02

T- PLATE

TOL- NBKK - S7 - MW03
TOC- NBKK-S7 - MW05 (BPK 405)

T-PLATE

TOC- NBKK-S7-MW02

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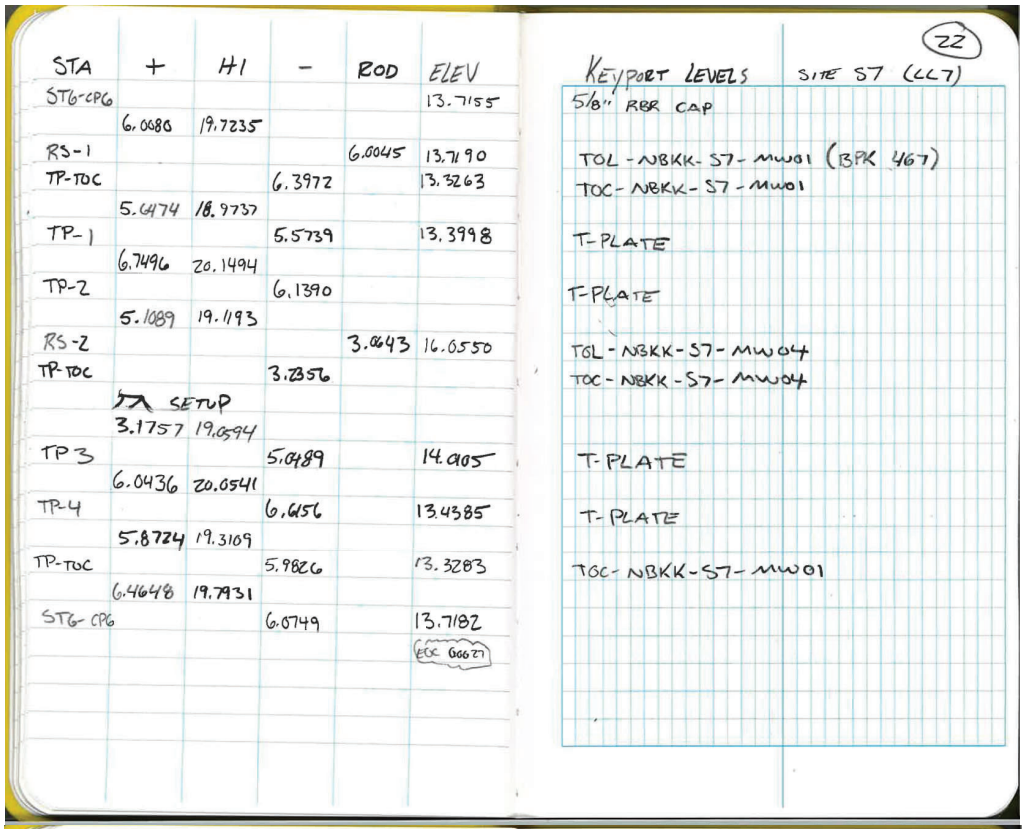


STA	+	HI	-	ROD	ELEV
STG-CP6					13.7155
	6.0680	19.7835			
RS-1				6.0045	13.7790
TP-TOC			6.3972		13.3263
	5.6474	18.9737			
TP-1			5.5739		13.3998
	6.7496	20.1494			
TP-2			6.1390		
	5.1089	19.1193			
RS-2				3.0643	16.0550
TP-TOC			3.2356		
	TA SETUP				
	3.1757	19.0594			
TP3			5.0489		14.0105
	6.0436	20.0541			
TP-4			6.1456		13.4385
	5.8724	19.3109			
TP-TOC			5.9826		13.3283
	6.4648	19.7931			
STG-CP6			6.0749		13.7182
					EOC 0.0027

(22)

KEYPORT LEVELS SITE S7 (LL7)

5/8" RBR CAP

TOL - NBKK-S7-MW01 (BPK 467)
TOC - NBKK-S7-MW01

T-PLATE

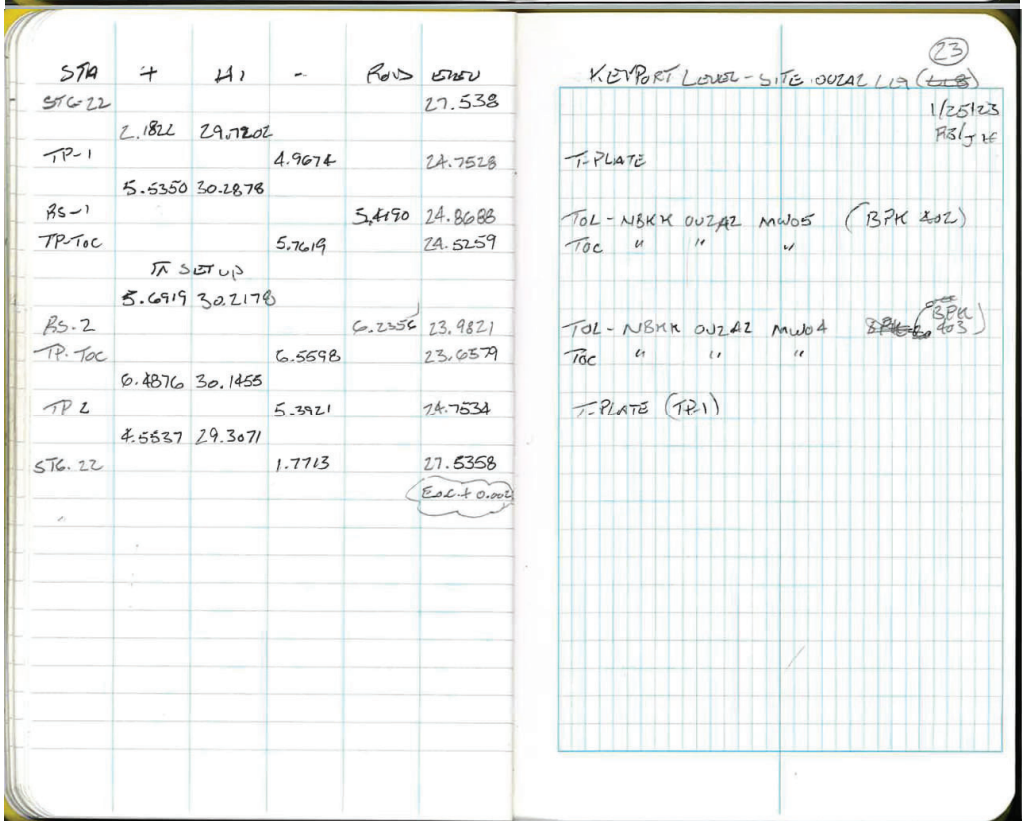
T-PLATE

TOL - NBKK-S7-MW04
TOC - NBKK-S7-MW04

T-PLATE

T-PLATE

TOC - NBKK-S7-MW01



STA	+	HI	-	ROD	ELEV
STG-22					27.538
	2.1822	29.7202			
TP-1			4.9674		24.7528
	5.5350	30.2878			
RS-1				5.4150	24.8688
TP-TOC			5.7619		24.5259
	TA SET UP				
	5.6919	30.2178			
RS-2				6.2356	23.9821
TP-TOC			6.5598		23.6579
	6.4876	30.1455			
TP 2			5.3921		24.7534
	4.5537	29.3071			
STG-22			1.7713		27.5358
					EOC 0.002

(23)

KEYPORT LEVEL - SITE OUZA2 L19 (~~LL8~~)

1/25/23
RBL/JE

T-PLATE

TOL - NBKK OUZA2 MW05 (BPK 402)
TOC " " " "

TOL - NBKK OUZA2 MW04 ~~BPK 403~~ (BPK 403)
TOC " " "

T-PLATE (TP-1)

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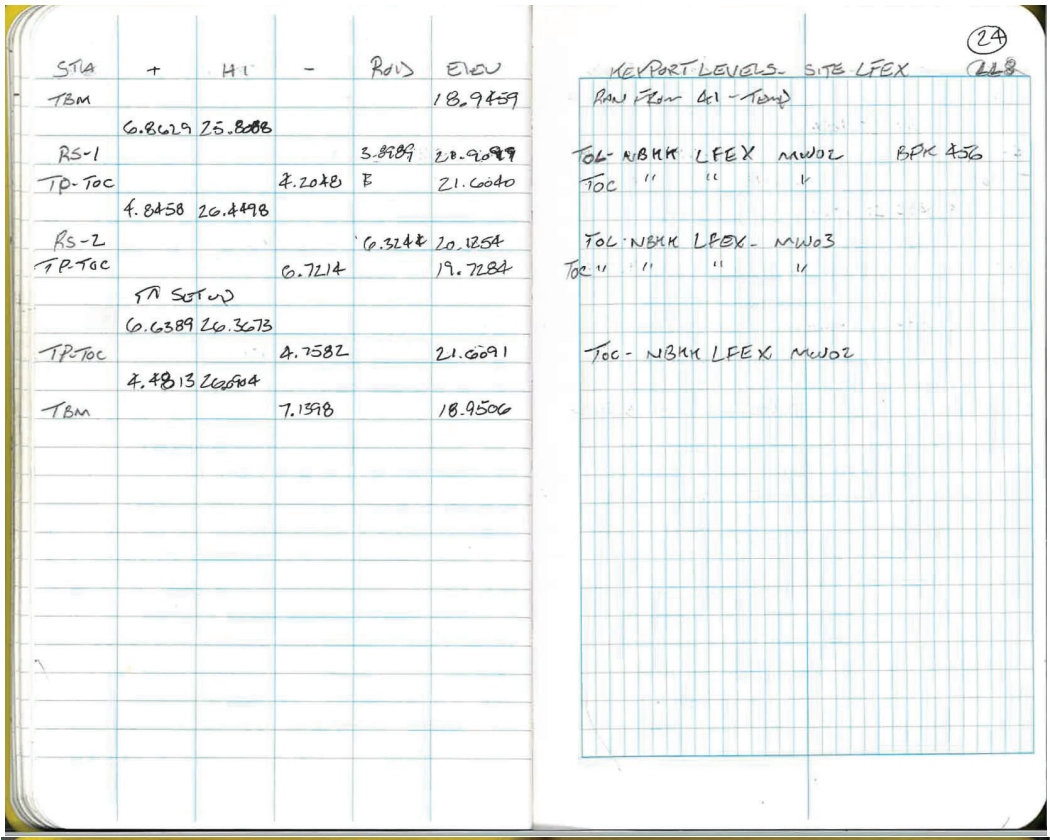


STA	+	HI	-	Rod	Elev
TBM					18.9459
	6.8629	25.8088			
RS-1				3.8989	20.9099
TP-Toc			4.2048	E	21.6040
	4.8458	26.4498			
RS-2				6.3248	20.1254
TP-Toc			6.7214		19.7284
	IN SETUP				
	6.6389	26.3673			
TP-Toc			4.7582		21.6091
	4.8813	26.4904			
TBM			7.1398		18.9506

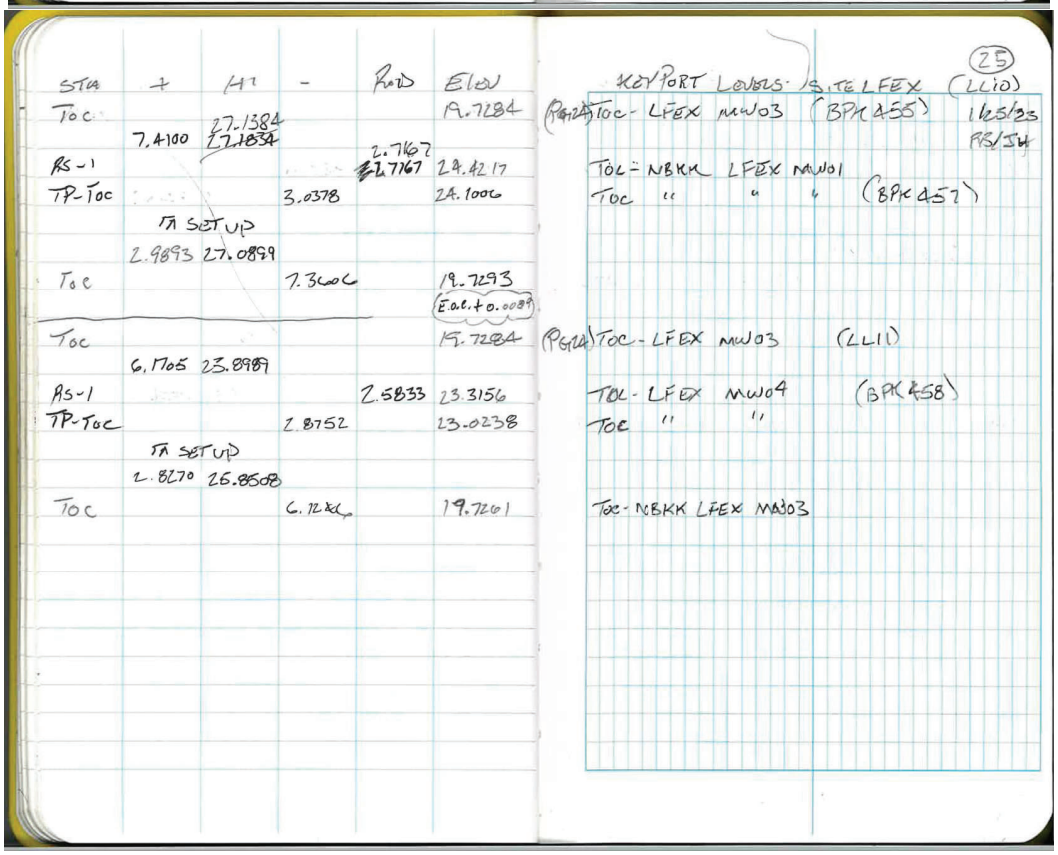
KEYPORT LEVELS - SITE LFEX (24)

RUN FROM 41 - TEMP

TOL - NBKK LFEX MW02 BPK 456
TOC " " " "

TOL - NBKK LFEX - MW03
TOC " " " "

TOC - NBKK LFEX MW02



STA	+	HI	-	Rod	Elev
Toc					19.7284
	7.4100	27.1384			
		27.1834			
RS-1				2.7467	24.4217
TP-Toc			3.0378		24.1006
	IN SETUP				
	2.9893	27.0899			
Toc			7.3006		19.7293
					(E.o.C. + 0.0009)
Toc					19.7284
	6.1705	25.8989			
RS-1				2.5833	23.3156
TP-Toc			2.8752		23.0238
	IN SETUP				
	2.8270	25.8508			
Toc			6.1206		19.7301

KEYPORT LEVELS: SITE LFEX (LL10) (25)

(PG24) TOC - LFEX MW03 (BPK 455) 1625/23 RS/SH

TOL - NBKK LFEX MW01
TOC " " " (BPK 457)

(PG24) TOC - LFEX MW03 (LL11)

TOL - LFEX MW04 (BPK 458)
TOC " "

TOC - NBKK LFEX MW03

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STA	+	HI	-	ROD	ELEV
TBM					18.9459
	4.3913	23.3372			
TP-1			7.4254		15.9118
	5.4725	21.3842			
~~TP~~ TP-TOC			5.6264		15.7579
	5.5853	21.3432			
TP-TOC			4.7959		16.5473
	⊼ SET UP				
	4.7611	21.3085			
TP2			5.3974		15.9111
	7.4839	23.3950			
TBM			4.4483		18.9467
					E.O.C. +0.0008

(26)

KEYPORT LEVELS - EXIST WELLS (1LL2)

MAG NAIL RUN FROM 41 — 1/25/23 RB/JH

T-PLATE

EX-MW1-48-TOC (TOP LID = 16.0587) - RODSHOT

EX-MW1-71-TOC TOP LID = 16.9166) - RODSHOT

T-PLATE (TP1)

STA	+	HI	-	ROD	ELEV
STG 22					27.538
	2.3755	29.9135			
TP 1			5.5438		24.3697
	1.4357	25.8053			
RS-1				2.1571	23.6482
~~R~~					
~~RS-2~~					
RS-2				1.9076	23.8977
TP TOC			2.5933		23.2120
	⊼ SET UP				
	2.4919	25.7039			
TP2			1.3356		24.3684
	4.9795	29.3478			
STG 22			1.8133		27.5346

(27)

KEYPORT-LEVELS-SITE-OU2A2 — LL23 CONG 2023

T-PLATE

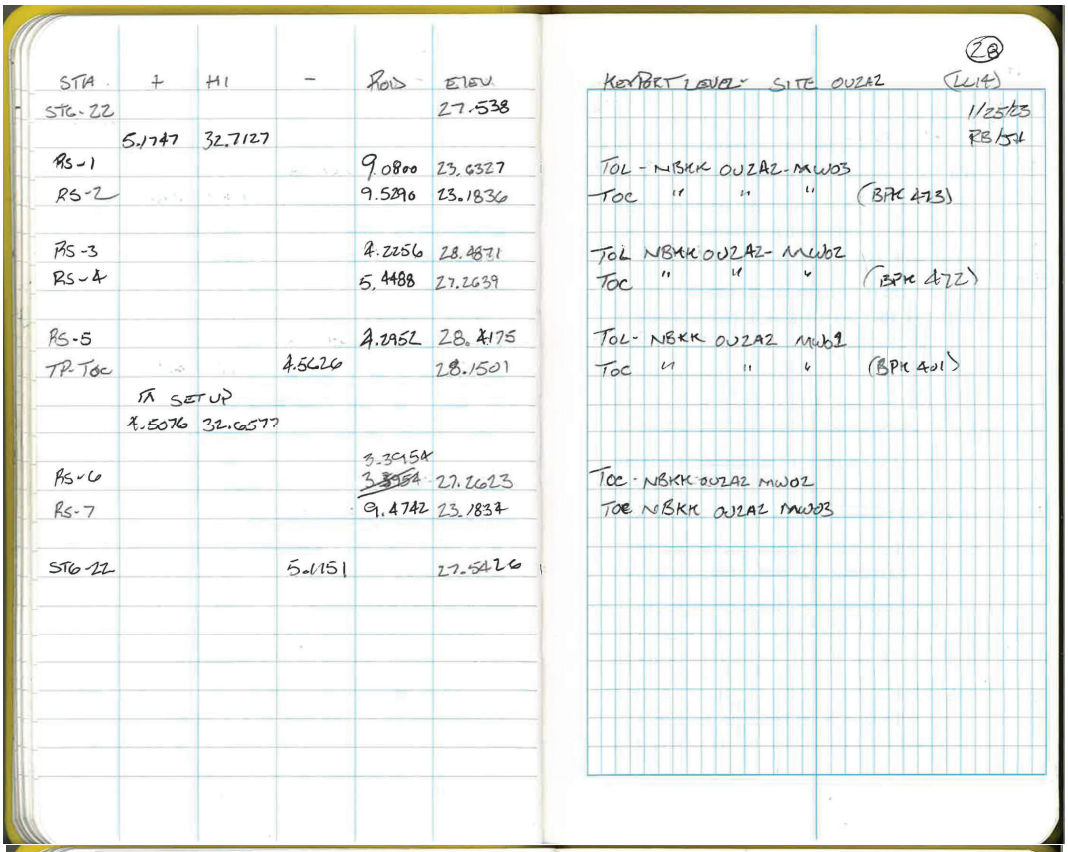
TOC-EX-MW-BNM 618-(1025) 20' SOUTH OF
NEWLY INSTALLED NBKK OU2A2-MW06-BPK404

TOC-NBKK OU2A2 MW06
TOC " " "

T-PLATE (TP1)

Jacobs

50 West Liberty Street
Suite 205
Reno, Nevada 89501 USA
1.775.360.7215



STA	+	HI	−	ROD	ELEV
STG-22					27.538
	5.1747	32.7127			
RS-1				9.0800	23.6327
RS-2				9.5296	23.1836
RS-3				4.2256	28.4871
RS-4				5.4488	27.2639
RS-5				4.2952	28.4175
TP-TOC			4.5626		28.1501
	TX SETUP				
	4.5076	32.6577			
RS-6				3.3954	27.2623
RS-7				9.4742	23.1834
STG-22			5.1151		27.5426

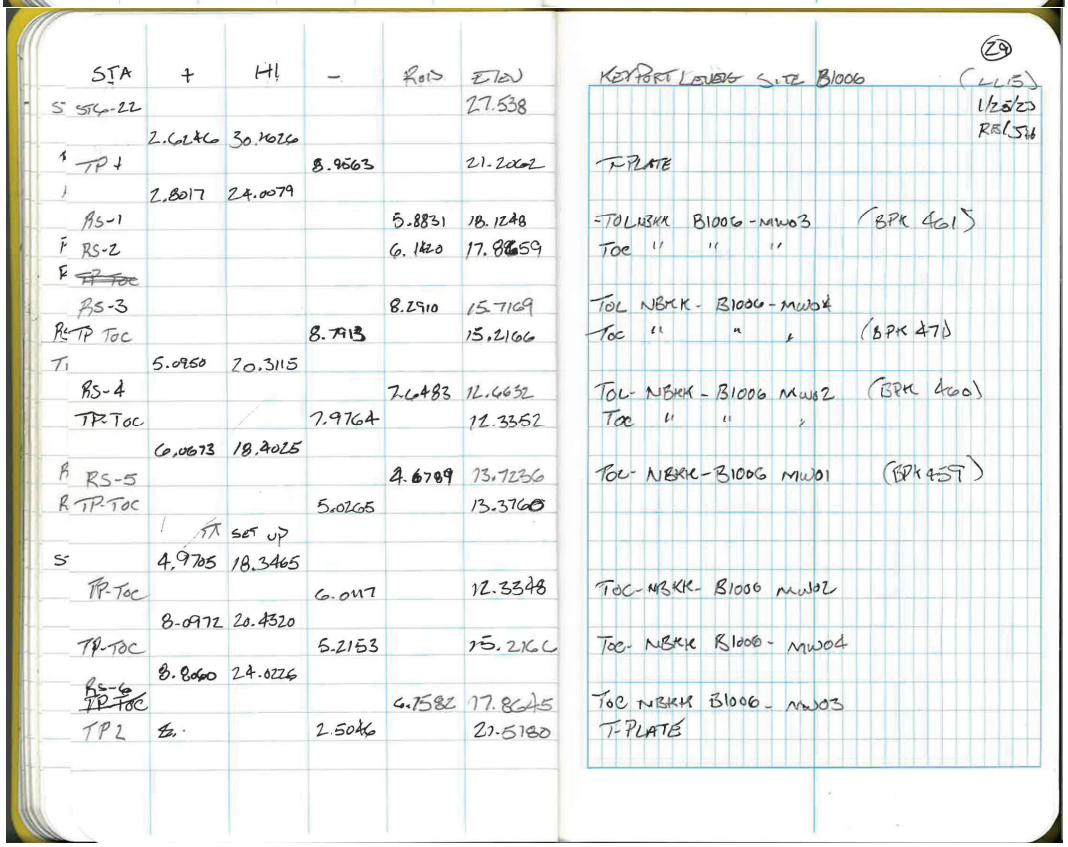
KEYPORT LEVEL SITE OU2A2 (LL14) 1/25/23 RB/JH

TOL - NBKK OU2A2 - MW03
TOC " " " (BPK 473)

TOL NBKK OU2A2 - MW02
TOC " " " (BPK 472)

TOL - NBKK OU2A2 MW01
TOC " " " (BPK 401)

TOC - NBKK OU2A2 MW02
TOE NBKK OU2A2 MW03



STA	+	HI	−	ROD	ELEV
STG-22					27.538
	2.6246	30.1626			
TP1			8.9563		21.2062
	2.8017	24.0079			
RS-1				5.8831	18.1248
RS-2				6.1420	17.8659
~~TP-TOC~~					
RS-3				8.2910	15.7169
TP-TOC			8.718		15.2166
	5.0950	20.3115			
RS-4				7.6483	12.6632
TP-TOC			7.9764		12.3352
	6.0673	18.4025			
RS-5				4.6789	13.7236
TP-TOC			5.0265		13.3760
	TX SET UP				
	4.9705	18.3465			
TP-TOC			6.0017		12.3348
	8.0972	20.4320			
TP-TOC			5.2153		15.2167
	8.8660	24.0226			
~~RS-6~~ ~~TP-TOC~~				6.4582	17.8245
TP2			2.5046		21.5180

KEYPORT LEVEL SITE B1006 (LL15) 1/26/23 RB/JH

T-PLATE

TOL NBKK B1006 - MW03 (BPK 461)
TOC " " "

TOL NBKK - B1006 - MW04
TOC " " " (BPK 471)

TOL - NBKK - B1006 MW02 (BPK 460)
TOC " " "

TOC - NBKK - B1006 MW01 (BPK 459)

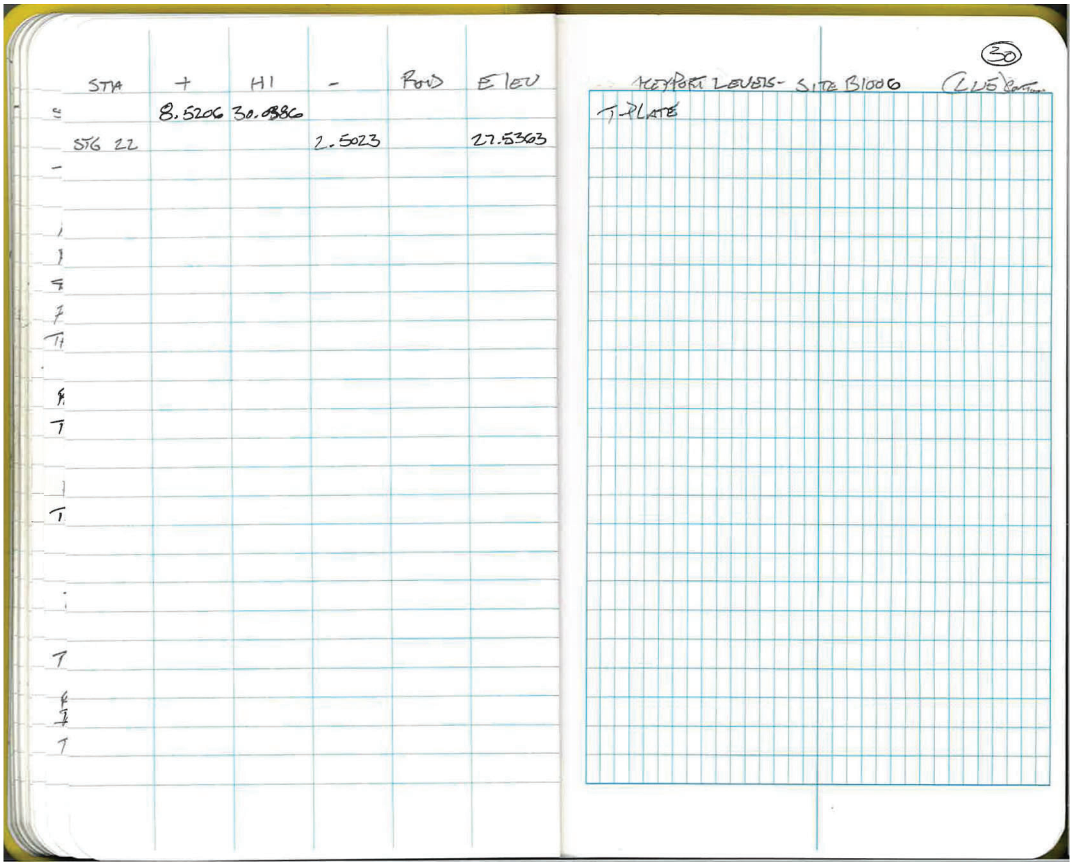
TOC - NBKK - B1006 MW02

TOC - NBKK B1006 - MW04

TOC NBKK B1006 - MW03
T-PLATE

Jacobs

50 West Liberty Street
Suite 205
Reno, Nevada 89501 USA
1.775.360.7215



KEYPORT LEVELS - SITE B1006 (LUE) Cont... (30)

STA	+	HI	-	ROD	ELEV
	8.5206	30.0386			
STG 22			2.5023		27.5363

T-PLATE

Jacobs

Additional Set Monitoring Wells at Building 76
Keyport Naval Base
Keyport, WA
Survey Date: August 2023

WELL	NORTHING	EASTING	GRND ELEV	PVC (MP) ELEV
B76-MW06	261455.68	1199985.70	43.263	42.989
B76-MW07	261340.96	1199985.89	50.152	49.918
B76-MW08	261337.78	1200075.29	54.708	54.367
B76-MW09	261288.49	1200083.60	54.837	54.589

SHALLOW SOIL SAMPLES

SAMPLE	NORTHING	EASTING	GRND ELEV
B76-SS12	261217.40	1200018.55	53.499
B76-SS13	261186.85	1200000.26	50.756
B76-SS11	261219.23	1199982.16	52.897
B76-SS10	261304.02	1200013.17	52.702

Appendix H
Investigation-derived Waste Data

Sample ID	NBKK-IDW04-AQ-102722
Sample Date	10/27/22
Chemical Name	
Per- and Polyfluorinated Alkyl Substances (NG/L)	
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	2.16 U
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	2.16 U
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	2.16 U
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (EtFOSAA)	2.16 U
N-Methyl Perfluorooctanesulfonamidoacetic Acid (MeFOSAA)	2.16 U
Perfluoro-2-methyl-3-oxahexanoic acid (HFPO-DA)	2.16 U
Perfluorobutanesulfonic acid (PFBS)	2.16 U
Perfluorodecanoic Acid (PFDA)	2.16 U
Perfluorododecanoic Acid (PFDoA)	2.16 U
Perfluoroheptanoic acid (PFHpA)	2.16 U
Perfluorohexanesulfonic acid (PFHxS)	2.16 U
Perfluorohexanoic Acid (PFHxA)	2.16 U
Perfluorononanoic acid (PFNA)	2.16 U
Perfluorooctane Sulfonate (PFOS)	22.9
Perfluorooctanoic acid (PFOA)	1.04 J
Perfluorotetradecanoic Acid (PFTeDA)	2.16 U
Perfluorotridecanoic Acid (PFTrDA)	2.16 U
Perfluoroundecanoic Acid (PFUnA)	2.16 U

Notes:
J - Analyte present. Value may or may not be accurate or precise
NG/L - Nanograms per liter
NS - Not sampled
U - The material was analyzed for, but not detected

Sample ID	NBKK-IDW04-AQ-102722	NBKK-IDW04-AQ-110122	NBKK-IDW11-AQ-012523	NBKK-IDW12-AQ-012523
Sample Date	10/27/22	11/1/22	1/25/23	1/25/23
Chemical Name				
Semivolatile Organic Compounds (UG/L)				
1-Methylnaphthalene	0.04 U	NA	0.041 U	0.041 U
2-Methylnaphthalene	0.04 UM	NA	0.041 U	0.041 U
Acenaphthene	0.03 UM	NA	0.031 UM	0.031 U
Acenaphthylene	0.03 U	NA	0.031 U	0.031 U
Anthracene	0.03 U	NA	0.031 U	0.031 U
Benzo(a)anthracene	0.03 U	NA	0.031 U	0.031 U
Benzo(a)pyrene	0.03 U	NA	0.031 U	0.031 U
Benzo(b)fluoranthene	0.03 UM	NA	0.031 U	0.031 U
Benzo(g,h,i)perylene	0.03 U	NA	0.031 U	0.031 U
Benzo(k)fluoranthene	0.03 UM	NA	0.031 U	0.031 U
Chrysene	0.03 U	NA	0.031 U	0.031 U
Dibenz(a,h)anthracene	0.04 U	NA	0.041 U	0.041 U
Fluoranthene	0.019 J	NA	0.031 U	0.031 U
Fluorene	0.03 U	NA	0.031 U	0.031 U
Indeno(1,2,3-cd)pyrene	0.04 U	NA	0.041 U	0.041 U
Naphthalene	0.061 U	NA	0.062 U	0.062 U
Phenanthrene	0.061 U	NA	0.062 U	0.062 U
Pyrene	0.014 J	NA	0.031 U	0.031 U
Total Metals (MG/L)				
Arsenic	7.60E-04 J	NA	0.0017 U	0.0017 U
Barium	0.034	NA	0.022	0.0024
Cadmium	0.0004 U	NA	0.0004 U	0.0004 U
Chromium	0.0042	NA	0.0029	0.0008 U
Copper	0.0019	NA	0.0046	5.50E-04 J
Lead	8.70E-04	NA	0.0012	0.0002 U
Mercury	0.16 U	NA	0.16 U	0.083 J
Nickel	0.0032	NA	0.0047	0.0008 U
Selenium	0.0006 U	NA	0.0006 U	0.0006 U
Silver	0.0003 U	NA	0.0003 U	0.0003 U
Zinc	0.01 J	NA	0.031	0.1

Sample ID	NBKK-IDW04-AQ-102722	NBKK-IDW04-AQ-110122	NBKK-IDW11-AQ-012523	NBKK-IDW12-AQ-012523
Sample Date	10/27/22	11/1/22	1/25/23	1/25/23
Chemical Name				
Wet Chemistry				
pH (SU)	7.4 HF	NA	7.5 HF	7.7 HF
Total organic halogens (TOX)	NA	27.7	14.9 UJ	NA U
Total Petroleum Hydrocarbons (UG/L)				
TPH-diesel range	130 M	NA	74 JM	92 UM
TPH-gas range	80 JM	NA	85 UM	85 UM
TPH-oil range	240 UM	NA	250 UM	250 UM
Reactivity (MG/KG)				
Reactive cyanide	48 U	NA	49 U	48 U
Sulfide	140 U	NA	140 U	140 U
Ignitability (DEG/F)				
Flash point	201 >	NA	200 >	200 >

Notes:
> - Greater than
B - Analyte not detected above the level reported in blanks
DEG/F - Degrees Fahrenheit
H - Sample was prepped or analyzed beyond the specified holding time
HF - Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
Q - One or more quality control criteria failed
J - Analyte present. Value may or may not be accurate or precise
M - Manual integrated compound
MG/KG - Milligrams per kilogram
MG/L - Milligrams per liter
NS - Not sampled
SU - Standard units
U - The material was analyzed for, but not detected
UG/L - Micrograms per liter

Sample ID	NBKK-IDW13-AQ-012523	NBKK-IDW14-AQ-012523	NBKK-IDW15-AQ-012523	NBKK-IDW16-AQ-012523	
Sample Date	1/25/23	1/25/23	1/25/23	1/25/23	
Chemical Name					
Semivolatile Organic Compounds (UG/L)					
1-Methylnaphthalene	0.042 U	0.044 U	0.042 U	5.1	0.046 UHM
2-Methylnaphthalene	0.042 U	0.044 U	0.042 U	4	0.046 UHMQ
Acenaphthene	0.031 U	0.033 U	0.031 U	0.032 UM	0.034 UHM
Acenaphthylene	0.031 U	0.033 U	0.031 U	0.032 UM	0.034 UHM
Anthracene	0.031 U	0.033 U	0.031 U	0.032 UM	0.034 UHM
Benzo(a)anthracene	0.031 U	0.033 U	0.031 U	0.032 UM	0.034 UHM
Benzo(a)pyrene	0.031 U	0.033 U	0.031 U	0.032 UM	0.034 UHM
Benzo(b)fluoranthene	0.031 U	0.033 U	0.031 U	0.032 UM	0.034 UHM
Benzo(g,h,i)perylene	0.031 U	0.033 U	0.031 U	0.11 M	0.03 JH
Benzo(k)fluoranthene	0.031 U	0.033 U	0.031 U	0.032 UM	0.034 UHMQ
Chrysene	0.031 U	0.033 U	0.031 U	0.032 UM	0.034 UHM
Dibenz(a,h)anthracene	0.042 U	0.044 U	0.042 U	0.042 UM	0.046 UH
Fluoranthene	0.031 U	0.033 U	0.031 U	0.15 M	0.034 UHM
Fluorene	0.031 U	0.033 U	0.031 U	0.39 M	0.034 UHM
Indeno(1,2,3-cd)pyrene	0.042 U	0.044 U	0.042 U	0.044 JM	0.046 UHM
Naphthalene	0.063 U	0.066 U	0.063 U	1.1 M	0.068 UHMQ
Phenanthrene	0.063 U	0.066 U	0.063 U	0.74 M	0.068 UHMQ
Pyrene	0.031 U	0.033 U	0.031 UM	0.38 M	0.071 HM
Total Metals (MG/L)					
Arsenic	0.0035	0.0047	0.0043	0.045	NA
Barium	0.011	0.037	0.023	1.1 B	NA
Cadmium	0.0004 U	0.0004 U	0.0004 U	0.0033	NA
Chromium	0.0008 U	0.0008 U	0.0008 U	0.33	NA
Copper	0.0024	0.0013	9.10E-04 J	0.3	NA
Lead	1.50E-04 J	1.20E-04 J	0.0002 U	0.12	NA
Mercury	0.16 U	0.16 U	0.16 U	0.58 J	NA
Nickel	0.0015	0.0024	0.0021	0.4	NA
Selenium	0.0006 U	0.0006 U	0.0006 U	0.002 J	NA
Silver	0.0003 U	0.0003 U	0.0003 U	0.0011 J	NA
Zinc	0.008 U	0.008 U	0.0058 J	0.53	NA

Sample ID	NBKK-IDW13-AQ-012523	NBKK-IDW14-AQ-012523	NBKK-IDW15-AQ-012523	NBKK-IDW16-AQ-012523	
Sample Date	1/25/23	1/25/23	1/25/23	1/25/23	
Chemical Name					
Wet Chemistry					
pH (SU)	7.6 HF	8.1 HF	8 HF	7.5 HF	NA
Total organic halogens (TOX)	NA U	NA U	15.4 UJ	205	NA
Total Petroleum Hydrocarbons (UG/L)					
TPH-diesel range	96 UM	96 UM	97 UM	4,900 M	NA
TPH-gas range	85 UM	85 UM	85 UM	330 M	NA
TPH-oil range	260 UM	260 UM	260 UM	6,900 M	NA
Reactivity (MG/KG)					
Reactive cyanide	49 U	50 U	50 U	49 U	NA
Sulfide	140 U	140 U	140 U	140 U	NA
Ignitability (DEG/F)					
Flash point	200 >	200 >	200 >	201 >	NA

Notes:
> - Greater than
B - Analyte not detected above the level repo
DEG/F - Degrees Fahrenheit
H - Sample was prepped or analyzed beyond
HF - Field parameter with a holding time of 1
Q - One or more quality control criteria failed
J - Analyte present. Value may or may not b
M - Manual integrated compound
MG/KG - Milligrams per kilogram
MG/L - Milligrams per liter
NS - Not sampled
SU - Standard units
U - The material was analyzed for, but not de
UG/L - Micrograms per liter

Sample ID	NBKK-IDW17-AQ-012523	NBKK-IDW18-AQ-012523	NBKK-IDW19-AQ-012523	NBKK-IDW20-AQ-012523
Sample Date	1/25/23	1/25/23	1/25/23	1/25/23
Chemical Name				
Semivolatile Organic Compounds (UG/L)				
1-Methylnaphthalene	0.041 U	0.042 U	0.045 U	0.042 U
2-Methylnaphthalene	0.041 U	0.042 U	0.045 U	0.042 U
Acenaphthene	0.031 U	0.031 U	0.034 UM	0.032 U
Acenaphthylene	0.031 UM	0.031 U	0.034 UM	0.032 U
Anthracene	0.031 UM	0.031 U	0.034 UM	0.032 UM
Benzo(a)anthracene	0.031 U	0.031 U	0.034 UM	0.032 UM
Benzo(a)pyrene	0.031 U	0.031 U	0.034 U	0.032 U
Benzo(b)fluoranthene	0.031 U	0.031 U	0.034 U	0.032 U
Benzo(g,h,i)perylene	0.031 U	0.031 U	0.034 U	0.032 U
Benzo(k)fluoranthene	0.031 U	0.031 U	0.034 U	0.032 U
Chrysene	0.031 UM	0.031 U	0.034 U	0.032 U
Dibenz(a,h)anthracene	0.041 U	0.042 U	0.045 U	0.042 U
Fluoranthene	0.031 UM	0.031 U	0.034 UM	0.032 UM
Fluorene	0.031 U	0.031 U	0.034 UM	0.032 U
Indeno(1,2,3-cd)pyrene	0.041 UM	0.042 UM	0.045 U	0.042 UM
Naphthalene	0.062 U	0.062 U	0.068 U	0.063 U
Phenanthrene	0.062 U	0.062 U	0.068 U	0.063 U
Pyrene	0.031 UM	0.031 U	0.034 UM	0.032 UM
Total Metals (MG/L)				
Arsenic	0.0025	0.0041	0.0017 U	0.0092
Barium	0.019	0.042	0.026	0.18 B
Cadmium	0.0004 U	0.0004 U	0.0004 U	7.50E-04
Chromium	0.0013 J	0.009	0.0019 J	0.04
Copper	0.0027	0.0096	0.0027	0.041
Lead	7.80E-04	0.0011	4.20E-04 J	0.014
Mercury	0.16 U	0.16 U	0.16 U	0.16 U
Nickel	0.0032	0.014	0.0065	0.042
Selenium	0.0006 U	0.0006 U	0.0006 U	6.70E-04 J
Silver	0.0003 U	0.0003 U	0.0003 U	0.0003 U
Zinc	0.0094 J	0.026	0.0082 J	0.09

Sample ID	NBKK-IDW17-AQ-012523	NBKK-IDW18-AQ-012523	NBKK-IDW19-AQ-012523	NBKK-IDW20-AQ-012523
Sample Date	1/25/23	1/25/23	1/25/23	1/25/23
Chemical Name				
Wet Chemistry				
pH (SU)	7.8 HF	8 HF	7.2 HF	7.5 HF
Total organic halogens (TOX)	NA U	21.6	36.2	223
Total Petroleum Hydrocarbons (UG/L)				
TPH-diesel range	95 UM	51 JM	130 M	100 UM
TPH-gas range	85 UM	85 UM	85 UM	85 UM
TPH-oil range	250 UM	250 UM	270 UM	270 UM
Reactivity (MG/KG)				
Reactive cyanide	49 U	51 U	48 U	49 U
Sulfide	140 U	140 U	140 U	140 U
Ignitability (DEG/F)				
Flash point	200 >	201 >	200 >	201 >

Notes:
> - Greater than
B - Analyte not detected above the level repo
DEG/F - Degrees Fahrenheit
H - Sample was prepped or analyzed beyond
HF - Field parameter with a holding time of 1
Q - One or more quality control criteria failed
J - Analyte present. Value may or may not b
M - Manual integrated compound
MG/KG - Milligrams per kilogram
MG/L - Milligrams per liter
NS - Not sampled
SU - Standard units
U - The material was analyzed for, but not de
UG/L - Micrograms per liter

Sample ID	NBKK-IDW01-SO-102722	NBKK-IDW02-SO-102722	NBKK-IDW03-SO-102722	NBKK-IDW05-SO-111522	NBKK-IDW06-SO-111522
Sample Date	10/27/22	10/27/22	10/27/22	11/15/22	11/15/22
Chemical Name					
Per- and Polyfluorinated Alkyl Substances (NG/G)					
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	0.5 U	0.5 U	0.5 U	0.583 U	0.587 U
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	0.5 U	0.5 U	0.5 U	0.583 U	0.587 U
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	0.5 U	0.5 U	0.5 U	0.583 U	0.587 U
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (EtFOSAA)	0.5 U	0.5 U	0.5 U	0.583 U	0.587 U
N-Methyl Perfluorooctanesulfonamidoacetic Acid (MeFOSAA)	0.5 U	0.5 U	0.5 U	0.583 U	0.587 U
Perfluoro-2-methyl-3-oxahexanoic acid (HFPO-DA)	0.5 U	0.5 U	0.5 U	0.583 U	0.587 U
Perfluorobutanesulfonic acid (PFBS)	0.5 U	0.5 U	0.5 U	0.583 U	0.587 U
Perfluorodecanoic Acid (PFDA)	0.5 U	0.5 U	0.5 U	0.583 U	0.587 U
Perfluorododecanoic Acid (PFDoA)	0.5 U	0.5 U	0.5 U	0.583 U	0.587 U
Perfluoroheptanoic acid (PFHpA)	0.5 U	0.5 U	0.5 U	0.583 U	0.587 U
Perfluorohexanesulfonic acid (PFHxS)	0.5 U	0.5 U	0.252 J	0.583 U	0.587 U
Perfluorohexanoic Acid (PFHxA)	0.5 U	0.5 U	0.5 U	0.583 U	0.587 U
Perfluorononanoic acid (PFNA)	0.5 U	0.5 U	0.5 U	0.583 U	0.587 U
Perfluorooctane Sulfonate (PFOS)	0.5 U	0.5 U	5.47	0.415 J	0.612 J
Perfluorooctanoic acid (PFOA)	0.5 U	0.5 U	0.5 U	0.583 U	0.587 U
Perfluorotetradecanoic Acid (PFTeDA)	0.5 U	0.5 U	0.5 U	0.583 U	0.587 U
Perfluorotridecanoic Acid (PFTrDA)	0.5 U	0.5 U	0.5 U	0.583 U	0.587 U
Perfluoroundecanoic Acid (PFUnA)	0.5 U	0.5 U	0.5 U	0.583 U	0.587 U

Notes:
J - Analyte present. Value may or may not be accurate or precise
NG/G - Nanograms per gram
NS - Not sampled
U - The material was analyzed for, but not detected

Sample ID	NBKK-IDW07-SO-111522	NBKK-IDW08-SO-111522	NBKK-IDW09-SO-111522	NBKK-IDW10-SO-111522
Sample Date	11/15/22	11/15/22	11/15/22	11/15/22
Chemical Name				
Per- and Polyfluorinated Alkyl Substances (NG/G)				
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	0.594 U	0.614 U	0.576 U	0.594 U
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	0.594 U	0.614 U	0.576 U	0.594 U
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	0.594 U	0.614 U	0.576 U	0.594 U
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (EtFOSAA)	0.594 U	0.614 U	0.576 U	0.594 U
N-Methyl Perfluorooctanesulfonamidoacetic Acid (MeFOSAA)	0.594 U	0.614 U	0.576 U	0.594 U
Perfluoro-2-methyl-3-oxahexanoic acid (HFPO-DA)	0.594 U	0.614 U	0.576 U	0.594 U
Perfluorobutanesulfonic acid (PFBS)	0.594 U	0.614 U	0.576 U	0.594 U
Perfluorodecanoic Acid (PFDA)	0.594 U	0.614 U	0.576 U	0.594 U
Perfluorododecanoic Acid (PFDoA)	0.594 U	0.614 U	0.576 U	0.594 U
Perfluoroheptanoic acid (PFHpA)	0.594 U	0.614 U	0.576 U	0.594 U
Perfluorohexanesulfonic acid (PFHxS)	0.594 U	0.614 U	0.576 U	0.594 U
Perfluorohexanoic Acid (PFHxA)	0.594 U	0.614 U	0.576 U	0.594 U
Perfluorononanoic acid (PFNA)	0.594 U	0.614 U	0.576 U	0.594 U
Perfluorooctane Sulfonate (PFOS)	0.594 U	0.614 U	4.58	0.594 U
Perfluorooctanoic acid (PFOA)	0.594 U	0.614 U	0.291 J	0.594 U
Perfluorotetradecanoic Acid (PFTeDA)	0.594 U	0.614 U	0.576 U	0.594 U
Perfluorotridecanoic Acid (PFTrDA)	0.594 U	0.614 U	0.576 U	0.594 U
Perfluoroundecanoic Acid (PFUnA)	0.594 U	0.614 U	0.576 U	0.594 U

Notes:
J - Analyte present. Value may or may not be accurate or precise
NG/G - Nanograms per gram
NS - Not sampled
U - The material was analyzed for, but not detected

Sample ID	NBKK-IDW01-SO-102722	NBKK-IDW02-SO-102722	NBKK-IDW03-SO-102722
Sample Date	10/27/22	10/27/22	10/27/22
Chemical Name			
TCLP Volatile Organic Compounds (UG/L)			
1,1-Dichloroethene	12 U	12 U	12 U
1,2-Dichloroethane	12 U	12 U	12 U
2-Butanone	20 UM	20 U	20 UM
Benzene	12 U	12 U	12 U
Carbon tetrachloride	12 U	12 U	12 U
Chlorobenzene	12 U	12 U	12 U
Chloroform	12 U	12 U	12 U
Tetrachloroethene	12 U	12 U	12 U
Trichloroethene	12 U	12 U	12 U
Vinyl chloride	10 U	10 U	10 U
Semivolatile Organic Compounds (MG/KG)			
1-Methylnaphthalene	0.0015 U	0.0074 Ucn	0.0075 Ucn
2-Methylnaphthalene	0.0031 U	0.015 Ucn	0.015 Ucn
Acenaphthene	0.0015 UM	0.0074 Ucn	0.0075 Ucn
Acenaphthylene	0.0015 U	0.0074 Ucn	0.0075 Ucn
Anthracene	0.0015 U	0.0074 Ucn	0.0075 Ucn
Benzo(a)anthracene	0.0015 U	0.0039 JDMcn	0.007 JDMcn
Benzo(a)pyrene	0.0015 U	0.004 JDcn	0.011 Dcn
Benzo(b)fluoranthene	9.40E-04 JM	0.0051 JDcn	0.0099 DMcn
Benzo(g,h,i)perylene	9.90E-04 J	0.0044 JDMcn	0.0082 JDMcn
Benzo(k)fluoranthene	0.0015 UM	0.0074 Ucn	0.0075 Ucn
Chrysene	8.40E-04 JM	0.0066 JDMcn	0.02 DMcn
Dibenz(a,h)anthracene	0.0015 UM	0.0074 UMcn	0.0075 UMcn
Fluoranthene	0.0015 U	0.007 JDcn	0.012 DMcn
Fluorene	0.0015 U	0.0074 UMcn	0.0075 UMcn
Indeno(1,2,3-cd)pyrene	0.0015 UM	0.0037 JDMcn	0.0059 JDMcn
Naphthalene	0.0031 U	0.0083 JDcn	0.015 Ucn
Phenanthrene	0.0023 U	0.01 JDcn	0.0084 JDcn
Pyrene	9.40E-04 J	0.0074 JDcn	0.015 DMcn

Sample ID	NBKK-IDW01-SO-102722	NBKK-IDW02-SO-102722	NBKK-IDW03-SO-102722
Sample Date	10/27/22	10/27/22	10/27/22
Chemical Name			
TCLP Semivolatile Organic Compounds (MG/L)			
1,4-Dichlorobenzene	0.005 U	0.005 U	0.005 U
2,4,5-Trichlorophenol	0.005 U	0.005 U	0.005 U
2,4,6-Trichlorophenol	0.005 U	0.005 U	0.005 U
2,4-Dinitrotoluene	0.01 U	0.01 U	0.01 U
2-Methylphenol	0.005 U	0.005 U	0.005 U
4-Methylphenol	0.005 U	0.005 U	0.005 U
Hexachlorobenzene	0.0011 U	0.0011 U	0.0011 U
Hexachlorobutadiene	0.005 U	0.005 U	0.005 U
Hexachloroethane	0.005 U	0.005 U	0.005 U
Nitrobenzene	0.005 UM	0.005 UM	0.005 UM
Pentachlorophenol	0.02 UM	0.02 UM	0.02 U
Pyridine	0.02 U	0.02 U	0.02 U
Total Metals (MG/KG)			
Arsenic	2.1 D	2.1 D	2.6 D
Barium	44 D	85 D	73 D
Cadmium	0.066 JD	1.1 D	0.085 JD
Chromium	26 D	31 D	32 D
Copper	18 D	50 D	18 D
Lead	3.5 D	40 D	15 D
Mercury	0.027 J	0.038 J	0.043 J
Nickel	33 D	37 D	45 D
Selenium	0.2 U	0.13 JD	0.18 U
Silver	0.082 U	0.13 D	0.43 D
Zinc	36 D	56 D	40 D
TCLP Metals (UG/L)			
Arsenic	17 U	17 U	17 U
Barium	310	470	590
Cadmium	4 U^	12	4 U
Chromium	11 J	9.3 J	5.2 J
Lead	2.4 J	42	5.9
Mercury	0.16 UJ1	0.16 U	0.16 U
Selenium	6 U	6 U	6 U
Silver	3 U^J1	3 U	3 U

Sample ID	NBKK-IDW01-SO-102722	NBKK-IDW02-SO-102722	NBKK-IDW03-SO-102722
Sample Date	10/27/22	10/27/22	10/27/22
Chemical Name			
Wet Chemistry (DEG/F)			
Flash point	200 >	201 >	201 >
Total organic halogens (TOX)	NA	NA	NA
Total Petroleum Hydrocarbons (MG/KG)			
TPH-diesel range	9.3 UMJ1	7.6 JM	8 JM
TPH-gas range	0.98 JD	0.92 JD	0.73 JD
TPH-oil range	23 UM	45 M	85 M
Reactivity (MG/KG)			
Reactive cyanide	49 U	49 U	49 U
Sulfide	140 U	140 U	140 U

Notes:
> - Greater than
D - Compound identified in an analysis at a secondary dilution factor.
DEG/F - Degrees Fahrenheit
^ - Instrument related QC is outside acceptable limits
J - Analyte present. Value may or may not be accurate or precise
M - Duplicate injection precision criteria not met
MG/KG - Milligrams per kilogram
NA - not available. Results pending.
NS - Not sampled
SU - Standard units
U - The material was analyzed for, but not detected
J1 - Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria
UG/L - Micrograms per liter
MG/L - Milligrams per liter

Sample ID	NBKK-IDW05-SO-111522	NBKK-IDW06-SO-111522	NBKK-IDW07-SO-111522
Sample Date	11/15/22	11/15/22	11/15/22
Chemical Name			
TCLP Volatile Organic Compounds (UG/L)			
1,1-Dichloroethene	NA	NA	NA
1,2-Dichloroethane	NA	NA	NA
2-Butanone	NA	NA	NA
Benzene	NA	NA	NA
Carbon tetrachloride	NA	NA	NA
Chlorobenzene	NA	NA	NA
Chloroform	NA	NA	NA
Tetrachloroethene	NA	NA	NA
Trichloroethene	NA	NA	NA
Vinyl chloride	NA	NA	NA
Semivolatile Organic Compounds (MG/KG)			
1-Methylnaphthalene	NA	NA	NA
2-Methylnaphthalene	NA	NA	NA
Acenaphthene	NA	NA	NA
Acenaphthylene	NA	NA	NA
Anthracene	NA	NA	NA
Benzo(a)anthracene	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA
Benzo(g,h,i)perylene	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	NA
Chrysene	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA
Fluoranthene	NA	NA	NA
Fluorene	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NA	NA	NA
Naphthalene	NA	NA	NA
Phenanthrene	NA	NA	NA
Pyrene	NA	NA	NA

Sample ID	NBKK-IDW05-SO-111522	NBKK-IDW06-SO-111522	NBKK-IDW07-SO-111522
Sample Date	11/15/22	11/15/22	11/15/22
Chemical Name			
TCLP Semivolatile Organic Compounds (MG/L)			
1,4-Dichlorobenzene	NA	NA	NA
2,4,5-Trichlorophenol	NA	NA	NA
2,4,6-Trichlorophenol	NA	NA	NA
2,4-Dinitrotoluene	NA	NA	NA
2-Methylphenol	NA	NA	NA
4-Methylphenol	NA	NA	NA
Hexachlorobenzene	NA	NA	NA
Hexachlorobutadiene	NA	NA	NA
Hexachloroethane	NA	NA	NA
Nitrobenzene	NA	NA	NA
Pentachlorophenol	NA	NA	NA
Pyridine	NA	NA	NA
Total Metals (MG/KG)			
Arsenic	NA	NA	NA
Barium	NA	NA	NA
Cadmium	NA	NA	NA
Chromium	NA	NA	NA
Copper	NA	NA	NA
Lead	NA	NA	NA
Mercury	NA	NA	NA
Nickel	NA	NA	NA
Selenium	NA	NA	NA
Silver	NA	NA	NA
Zinc	NA	NA	NA
TCLP Metals (UG/L)			
Arsenic	NA	NA	NA
Barium	NA	NA	NA
Cadmium	NA	NA	NA
Chromium	NA	NA	NA
Lead	NA	NA	NA
Mercury	NA	NA	NA
Selenium	NA	NA	NA
Silver	NA	NA	NA

Sample ID	NBKK-IDW05-SO-111522	NBKK-IDW06-SO-111522	NBKK-IDW07-SO-111522
Sample Date	11/15/22	11/15/22	11/15/22
Chemical Name			
Wet Chemistry (DEG/F)			
Flash point	NA	NA	NA
Total organic halogens (TOX)	5.7 U	5.6 U	5.6 U
Total Petroleum Hydrocarbons (MG/KG)			
TPH-diesel range	NA	NA	NA
TPH-gas range	NA	NA	NA
TPH-oil range	NA	NA	NA
Reactivity (MG/KG)			
Reactive cyanide	NA	NA	NA
Sulfide	NA	NA	NA

Notes:
> - Greater than
D - Compound identified in an analysis at a secondary dilution factor.
DEG/F - Degrees Fahrenheit
^ - Instrument related QC is outside acceptable limits
J - Analyte present. Value may or may not be accurate or precise
M - Duplicate injection precision criteria not met
MG/KG - Milligrams per kilogram
NA - not available. Results pending.
NS - Not sampled
SU - Standard units
U - The material was analyzed for, but not detected
J1 - Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria
UG/L - Micrograms per liter
MG/L - Milligrams per liter

Sample ID	NBKK-IDW08-SO-111522	NBKK-IDW09-SO-111522	NBKK-IDW10-SO-111522
Sample Date	11/15/22	11/15/22	11/15/22
Chemical Name			
TCLP Volatile Organic Compounds (UG/L)			
1,1-Dichloroethene	NA	NA	NA
1,2-Dichloroethane	NA	NA	NA
2-Butanone	NA	NA	NA
Benzene	NA	NA	NA
Carbon tetrachloride	NA	NA	NA
Chlorobenzene	NA	NA	NA
Chloroform	NA	NA	NA
Tetrachloroethene	NA	NA	NA
Trichloroethene	NA	NA	NA
Vinyl chloride	NA	NA	NA
Semivolatile Organic Compounds (MG/KG)			
1-Methylnaphthalene	NA	NA	NA
2-Methylnaphthalene	NA	NA	NA
Acenaphthene	NA	NA	NA
Acenaphthylene	NA	NA	NA
Anthracene	NA	NA	NA
Benzo(a)anthracene	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA
Benzo(g,h,i)perylene	NA	NA	NA
Benzo(k)fluoranthene	NA	NA	NA
Chrysene	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA
Fluoranthene	NA	NA	NA
Fluorene	NA	NA	NA
Indeno(1,2,3-cd)pyrene	NA	NA	NA
Naphthalene	NA	NA	NA
Phenanthrene	NA	NA	NA
Pyrene	NA	NA	NA

Sample ID	NBKK-IDW08-SO-111522	NBKK-IDW09-SO-111522	NBKK-IDW10-SO-111522
Sample Date	11/15/22	11/15/22	11/15/22
Chemical Name			
TCLP Semivolatile Organic Compounds (MG/L)			
1,4-Dichlorobenzene	NA	NA	NA
2,4,5-Trichlorophenol	NA	NA	NA
2,4,6-Trichlorophenol	NA	NA	NA
2,4-Dinitrotoluene	NA	NA	NA
2-Methylphenol	NA	NA	NA
4-Methylphenol	NA	NA	NA
Hexachlorobenzene	NA	NA	NA
Hexachlorobutadiene	NA	NA	NA
Hexachloroethane	NA	NA	NA
Nitrobenzene	NA	NA	NA
Pentachlorophenol	NA	NA	NA
Pyridine	NA	NA	NA
Total Metals (MG/KG)			
Arsenic	NA	NA	NA
Barium	NA	NA	NA
Cadmium	NA	NA	NA
Chromium	NA	NA	NA
Copper	NA	NA	NA
Lead	NA	NA	NA
Mercury	NA	NA	NA
Nickel	NA	NA	NA
Selenium	NA	NA	NA
Silver	NA	NA	NA
Zinc	NA	NA	NA
TCLP Metals (UG/L)			
Arsenic	NA	NA	NA
Barium	NA	NA	NA
Cadmium	NA	NA	NA
Chromium	NA	NA	NA
Lead	NA	NA	NA
Mercury	NA	NA	NA
Selenium	NA	NA	NA
Silver	NA	NA	NA

Sample ID	NBKK-IDW08-SO-111522	NBKK-IDW09-SO-111522	NBKK-IDW10-SO-111522
Sample Date	11/15/22	11/15/22	11/15/22
Chemical Name			
Wet Chemistry (DEG/F)			
Flash point	NA	NA	NA
Total organic halogens (TOX)	5.5 U	5.2 U	5.8 U
Total Petroleum Hydrocarbons (MG/KG)			
TPH-diesel range	NA	NA	NA
TPH-gas range	NA	NA	NA
TPH-oil range	NA	NA	NA
Reactivity (MG/KG)			
Reactive cyanide	NA	NA	NA
Sulfide	NA	NA	NA

Notes:
> - Greater than
D - Compound identified in an analysis at a secondary dilution factor.
DEG/F - Degrees Fahrenheit
^ - Instrument related QC is outside acceptable limits
J - Analyte present. Value may or may not be accurate or precise
M - Duplicate injection precision criteria not met
MG/KG - Milligrams per kilogram
NA - not available. Results pending.
NS - Not sampled
SU - Standard units
U - The material was analyzed for, but not detected
J1 - Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria
UG/L - Micrograms per liter
MG/L - Milligrams per liter

Sample ID	NBKK-B76-IDW01-AQ-081623	NBKK-B76-IDW02-AQ-081623
Sample Date	8/16/23	8/16/23
Chemical Name		
Per- and Polyfluorinated Alkyl Substances (NG/L)		
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	2.22 U	2.22 U
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	2.22 U	2.22 U
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	2.22 U	2.22 U
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (EtFOSAA)	2.22 U	2.22 U
N-Methyl Perfluorooctanesulfonamidoacetic Acid (MeFOSAA)	2.22 U	2.22 U
Perfluoro-2-methyl-3-oxahexanoic acid (HFPO-DA)	2.22 U	2.22 U
Perfluorobutanesulfonic acid (PFBS)	2.22 U	0.89 J
Perfluorodecanoic Acid (PFDA)	2.22 U	2.22 U
Perfluorododecanoic Acid (PFDoA)	2.22 U	2.22 U
Perfluoroheptanoic acid (PFHpA)	20.2	5.47
Perfluorohexanesulfonic acid (PFHxS)	20.8	7.37
Perfluorohexanoic Acid (PFHxA)	32.3	10.3
Perfluorononanoic acid (PFNA)	2.22 U	2.02 J
Perfluorooctane Sulfonate (PFOS)	85.6 Q	15.8
Perfluorooctanoic acid (PFOA)	26.1	10.8
Perfluorotetradecanoic Acid (PFTeDA)	2.22 U	2.22 U
Perfluorotridecanoic Acid (PFTrDA)	2.22 U	2.22 U
Perfluoroundecanoic Acid (PFUnA)	2.22 U	2.22 U

Notes:
J - Analyte present. Value may or may not be accurate or precise
NG/L - Nanograms per liter
NS - Not sampled
Q - One or more quality control criteria failed
U - The material was analyzed for, but not detected

Sample ID	NBKK-B76-IDW01A-AQ-081723		NBKK-B76-IDW02A-AQ-081723
Sample Date	8/17/23		8/17/23
Chemical Name			
Semivolatile Organic Compounds (UG/L)			
1-Methylnaphthalene	0.025 JMQ	NA	0.04 UQ
2-Methylnaphthalene	0.029 JMQ	NA	0.04 UMQ
Acenaphthene	0.03 UMQ	NA	0.03 UMQ
Acenaphthylene	0.03 UMQ	NA	0.03 UQ
Anthracene	0.03 UQ	NA	0.03 UMQ
Benzo(a)anthracene	0.03 U	NA	0.03 U
Benzo(a)pyrene	0.03 UMQ	NA	0.03 UMQ
Benzo(b)fluoranthene	0.03 UMQ	NA	0.03 UQ
Benzo(g,h,i)perylene	0.011 JMQ	NA	0.03 UQ
Benzo(k)fluoranthene	0.03 UQ	NA	0.03 UQ
Chrysene	0.03 U	NA	0.03 U
Dibenz(a,h)anthracene	0.04 UQ	NA	0.04 UQ
Fluoranthene	0.029 JQ	NA	0.03 UQ
Fluorene	0.03 UMQ	NA	0.03 UQ
Indeno(1,2,3-cd)pyrene	0.04 UMQ	NA	0.04 UQ
Naphthalene	0.06 UQ	NA	0.06 UMQ
Phenanthrene	0.06 UMQ	NA	0.06 UQ
Pyrene	0.03 UM	NA	0.03 UM
Pesticide/Polychlorinated Biphenyls (UG/L)			
Aroclor-1016	0.2 UM	NA	0.2 U
Aroclor-1221	0.2 UM	NA	0.2 U
Aroclor-1232	0.2 UM	NA	0.2 U
Aroclor-1242	0.2 UM	NA	0.2 U
Aroclor-1248	0.2 UM	NA	0.2 U
Aroclor-1254	0.2 UM	NA	0.2 U
Aroclor-1260	0.2 UM	NA	0.2 UM
Total Metals (MG/L)			
Arsenic	0.014	NA	0.0017 J
Barium	0.16	NA	0.047
Cadmium	0.062	NA	0.0004 U
Chromium	0.046	NA	0.0011 U
Copper	0.072	NA	3.60E-04 J
Lead	0.034	NA	0.0002 U
Mercury	0.092 J	NA	0.16 U
Nickel	0.053	NA	0.0032
Selenium	0.022	NA	0.0006 U
Silver	0.0012	NA	0.0003 U
Zinc	0.88	NA	0.0068 J
Wet Chemistry			
Flash point (DEG/F)	201 >	NA	200 >
pH (SU)	9 HF	NA	7.4 HF
Total Petroleum Hydrocarbons (UG/L)			
TPH-diesel range	3,200 MQ	NA	95 UMQ
TPH-gas range	85 UM	85 UM	85 UM
TPH-oil range	1,400 M	NA	250 UM

Sample ID	NBKK-B76-IDW01A-AQ-081723		NBKK-B76-IDW02A-AQ-081723
Sample Date	8/17/23		8/17/23
Chemical Name			
Reactivity (MG/KG)			
Reactive cyanide	49 U	NA	49 U
Sulfide	140 U	NA	140 U

Notes:
> - Greater than
DEG/F - Degrees Fahrenheit
HF - Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request
J - Analyte present. Value may or may not be accurate or precise
M - Duplicate injection precision criteria not met
MG/KG - Milligrams per kilogram
MG/L - Milligrams per liter
NA - Not analyzed
NONE - None
Q - One or more quality control criteria failed
SU - Standard units
U - The material was analyzed for, but not detected
UG/L - Micrograms per liter

Sample ID	NBKK-B76-IDW01-SO-081523	NBKK-B76-IDW02-SO-081623
Sample Date	8/15/23	8/16/23
Chemical Name		
Per- and Polyfluorinated Alkyl Substances (NG/G)		
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)	0.5 U	0.499 U
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	0.5 U	0.499 U
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	0.5 U	0.499 U
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (EtFOSAA)	0.5 U	0.499 U
N-Methyl Perfluorooctanesulfonamidoacetic Acid (MeFOSAA)	0.5 U	0.499 U
Perfluoro-2-methyl-3-oxahexanoic acid (HFPO-DA)	0.5 U	0.499 U
Perfluorobutanesulfonic acid (PFBS)	0.5 U	0.499 U
Perfluorodecanoic Acid (PFDA)	0.5 U	0.499 U
Perfluorododecanoic Acid (PFDoA)	0.5 U	0.499 U
Perfluoroheptanoic acid (PFHpA)	0.5 U	0.499 U
Perfluorohexanesulfonic acid (PFHxS)	0.5 U	0.499 U
Perfluorohexanoic Acid (PFHxA)	0.5 U	0.499 U
Perfluorononanoic acid (PFNA)	0.5 U	0.499 U
Perfluorooctane Sulfonate (PFOS)	1.11	0.647 J
Perfluorooctanoic acid (PFOA)	0.5 U	0.499 U
Perfluorotetradecanoic Acid (PFTeDA)	0.5 U	0.499 U
Perfluorotridecanoic Acid (PFTrDA)	0.5 U	0.499 U
Perfluoroundecanoic Acid (PFUnA)	0.5 U	0.499 U

Notes:
J - Analyte present. Value may or may not be accurate or precise
NG/G - Nanograms per gram
NS - Not sampled
U - The material was analyzed for, but not detected

Sample ID	NBKK-B76-IDW01A-SO-081723		NBKK-B76-IDW02A-SO-081723	
Sample Date	8/17/23		8/17/23	
Chemical Name				
TCLP Volatile Organic Compounds (UG/L)				
1,1-Dichloroethene	12 U	NA	12 U	NA
1,2-Dichloroethane	12 UQ	NA	12 UQ	NA
2-Butanone	20 UM	NA	27 JD	NA
Benzene	12 U	NA	12 U	NA
Carbon tetrachloride	12 U	NA	12 U	NA
Chlorobenzene	12 U	NA	12 U	NA
Chloroform	12 U	NA	12 U	NA
Tetrachloroethene	12 U	NA	12 U	NA
Trichloroethene	12 U	NA	12 U	NA
Vinyl chloride	12 U	NA	12 U	NA
Semivolatile Organic Compounds (MG/KG)				
1-Methylnaphthalene	0.00091 J	0.0014 JB	0.0096 U	NA
2-Methylnaphthalene	0.003 U	0.0019 JB	0.019 U	NA
Acenaphthene	0.0011 J	0.0015 U	0.0096 U	NA
Acenaphthylene	0.00086 J	0.0015 UM	0.0096 U	NA
Anthracene	0.0023	0.0015 U	0.0096 U	NA
Benzo(a)anthracene	0.0055 M	0.0017 JM	0.0096 UM	NA
Benzo(a)pyrene	0.0062	0.0023	0.0096 U	NA
Benzo(b)fluoranthene	0.0085	0.0029 M	0.0096 U	NA
Benzo(g,h,i)perylene	0.0054 M	0.002	0.0096 U	NA
Benzo(k)fluoranthene	0.0038	0.00097 JM	0.0096 U	NA
Chrysene	0.0074 M	0.0024 M	0.0024 JM	NA
Dibenz(a,h)anthracene	0.0015 JM	0.0015 UM	0.0096 U	NA
Fluoranthene	0.01	0.0036	0.0096 U	NA
Fluorene	0.0014 J	0.0015 U	0.0096 U	NA
Indeno(1,2,3-cd)pyrene	0.0051 M	0.0016 JM	0.0096 U	NA
Naphthalene	0.003 U	0.0019 J	0.019 U	NA
Phenanthrene	0.0044	0.0031	0.014 U	NA
Pyrene	0.0092	0.0062	0.0096 U	NA
TCLP Semivolatile Organic Compounds (MG/L)				
1,4-Dichlorobenzene	0.005 U	NA	0.005 U	NA
2,4,5-Trichlorophenol	0.005 U	NA	0.005 U	NA
2,4,6-Trichlorophenol	0.005 U	NA	0.005 U	NA
2,4-Dinitrotoluene	0.01 U	NA	0.01 U	NA
2-Methylphenol	0.005 U	NA	0.005 U	NA
4-Methylphenol	0.005 U	NA	0.005 U	NA
Hexachlorobenzene	0.0011 U	NA	0.0011 U	NA
Hexachlorobutadiene	0.005 U	NA	0.005 U	NA
Hexachloroethane	0.005 U	NA	0.005 U	NA
Nitrobenzene	0.005 UM	NA	0.005 U	NA
Pentachlorophenol	0.02 UM	NA	0.02 UMQ	NA
Pyridine	0.02 U	NA	0.02 U	NA
Pesticide/Polychlorinated Biphenyls (MG/KG)				
Aroclor-1016	0.011 UM	NA	0.074 U	NA
Aroclor-1221	0.011 U	NA	0.074 U	NA
Aroclor-1232	0.011 UM	NA	0.074 U	NA
Aroclor-1242	0.011 UM	NA	0.074 U	NA
Aroclor-1248	0.011 UM	NA	0.074 U	NA
Aroclor-1254	0.011 UM	NA	0.074 U	NA
Aroclor-1260	0.011 UM	NA	0.074 U	NA

Sample ID	NBKK-B76-IDW01A-SO-081723		NBKK-B76-IDW02A-SO-081723	
Sample Date	8/17/23		8/17/23	
Chemical Name				
Total Metals (MG/KG)				
Arsenic	3.9 D	NA	3.5 D	NA
Barium	77 D	NA	120 D	NA
Cadmium	0.16 D	NA	0.42 D	NA
Chromium	26 D	NA	32 D	NA
Copper	14 D	NA	17 D	NA
Lead	36 D	NA	9.7 D	NA
Mercury	0.034 J	NA	0.035 J	NA
Nickel	36 D	NA	43 D	NA
Selenium	0.11 JD	NA	0.94 D	NA
Silver	0.08 U	NA	0.082 JD	NA
Zinc	50 D	NA	43 D	NA
TCLP Metals (UG/L)				
Arsenic	17 U	NA	17 U	NA
Barium	370 B	NA	510 B	NA
Cadmium	4 U	NA	2.4 J	NA
Chromium	11 U	NA	11 U	NA
Lead	19	NA	6	NA
Mercury	0.16 U	NA	0.16 U	NA
Selenium	6 U	NA	6 U	NA
Silver	3 U	NA	3 U	NA
Wet Chemistry (DEG/F)				
Flash point	201 >	NA	201 >	NA
Total Petroleum Hydrocarbons (MG/KG)				
TPH-diesel range	15 MJ1	NA	16 M	NA
TPH-gas range	0.27 JDQ	4.4 U	28 UQ	28 U
TPH-oil range	52 M	NA	18 JM	NA
Reactivity (MG/KG)				
Reactive cyanide	48 U	NA	48 U	NA
Sulfide	140 U	NA	140 U	NA

Notes:
> - Greater than
B - Analyte not detected above the level reported in blanks
D - Compound identified in an analysis at a secondary dilution factor.
DEG/F - Degrees Fahrenheit
J - Analyte present. Value may or may not be accurate or precise
J1 - Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria
M - Duplicate injection precision criteria not met
MG/KG - Milligrams per kilogram
MG/L - Milligrams per liter
NS - Not sampled
Q - One or more quality control criteria failed
U - The material was analyzed for, but not detected
U - The material was analyzed for, but not detected
UG/L - Micrograms per liter

CTO-4117: Northwest PFAS Investigation
Project No G25161.X1.XX.0026.000001
PFAS by DoD QSM 5.3 Table B-15

WATER

Batch 23-0123

Package DP-23-0139

Submitted to:
CH2M
5701 Cleveland Street
Virginia Beach, VA 23462 USA

Submitted by:
Battelle Norwell Operations
141 Longwater Drive Suite 202
Norwell, MA 02061

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CTO-4117: Northwest PFAS Investigation
Project No G25161.X1.XX.0026.000001
PFAS by DoD QSM 5.3 Table B-15

WATER

Batch 23-0123

Package DP-23-0139

Submitted to:
CH2M
5701 Cleveland Street
Virginia Beach, VA 23462 USA

NELAP Accreditation Number: E87856 (Florida Department of Health)
DoD-ELAP Accreditation Number: 91667

Submitted by:
Battelle Norwell Operations
141 Longwater Drive Suite 202
Norwell, MA 02061

Analyst Approval:		Kelsey Harnden 2023.02.15 13:39:29 -05'00'
QC Chemist Approval:		Deb Huntress 2023.02.15 13:30:20 -05'00'
Project Manager Approval:		Robert Lizotte, Jr. 2023.02.15 13:44:13 -05'00'

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CTO-4117: Northwest PFAS Investigation
Project No G25161.X1.XX.0026.000001
PFAS by DoD QSM 5.3 Table B-15

WATER

Batch 23-0123

Package DP-23-0139

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Master Signature Page

Name (Printed)	Signature	Initials	Date
Jonathan Thorn		JRT	1/9/2020
Robert Lizotte, Jr.		BL	1.9.2020
Elyn M Fitch		EMF	1/9/2020
Carla Devine		CRD	1/9/2020
Denise Schumitz		DS	1/9/2020
Lauren Griffith		LMG	1.9.2020
Carrie P McCarthy		CPM	1/9/2020
Rich Restuccia		RR	1/9/2020
Sam Guimaraes		SAG	1/9/2020
Jordan Tower		JLT	1/9/2020
Christie Usher		CU	1/9/2020
Kevin McInerney		KM	1/14/2020
Matt Schumitz		MDS	1/14/2020
Weidong Li		W.L	1/14/2020
Kayla Lamarre		KAL	1/14/2020
MUNAZ MUNTASIR		MM	01/14/2020
Kristen Nichols		KN	01/14/2020
Kelsey Harnden		KH	01/30/2020
Kevin Bailey		KB	1/30/2020
Stephanie Schultz		SAS	1/30/2020

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Name (Printed)	Signature	Initials	Date
Clinicea Brown		CB	01/30/20
Ryan Kelly		RK	01/30/20
KAREN HYPPOLITE		K.H.	01/31/20
Gail DeRuzzo		GD	01/31/2020
Tracy Stenner			1/31/2020
Ashley Wellington		AW	1131/2020
Daniel Cooney		DAC	1/31/2020
Peter Demers		PD	1/31/2020
Andy Delmar		AD	3/19/2021
Emily Reardon		ER	3/19/2021
Brenton Murphy		Bm	3/19/2021
Haley Hart		H H	3/19/21
Allison Wamaess		AW	3/19/21
Taylor Noonan		TN	3/19/21
FRANCO PALA		FP	3/19/21
Amina Chamanlal		AC	11/03/21
J Michelle Wentzell		MW	11-3-21
Zachary Dreiker		ZD	11/3/21
Drew Croke		DC	11/3/21
Zachary Willenberg		ZW	11/3/21

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Name (Printed)	Signature	Initials	Date
Hayley Beal	Hayley Beal	HB	5/9/2022
Nathaniel Kinsman	Nathaniel Kinsman	NK	5/9/2022
Debra Huntress	Debra Huntress	DHU	5/9/22
Vincent Urso	Vincent Urso	VU	5/9/22

Sample Summary

Client: CH2M (Jacobs)
SDG: 23-0123
Project/Site: NBK Keyport
CTO: 4117

Lab Sample ID	Client Sample ID	Matrix	Collection Date	Receipt Date
DL946PB-FS	Procedural Blank	WATER	2/8/2023	2/8/2023
DL947LCS-FS	Laboratory Control Sample	WATER	2/8/2023	2/8/2023
D2265-FS	NBKK-IDW11-AQ-012523	WATER	1/25/2023	1/30/2023
D2266-FS	NBKK-IDW12-AQ-012523	WATER	1/25/2023	1/30/2023
D2267-FS	NBKK-IDW13-AQ-012523	WATER	1/25/2023	1/30/2023
D2268-FS	NBKK-IDW14-AQ-012523	WATER	1/25/2023	1/30/2023
D2269-FS	NBKK-IDW15-AQ-012523	WATER	1/25/2023	1/30/2023
D2270-FS	NBKK-IDW16-AQ-012523	WATER	1/25/2023	1/30/2023
D2271-FS	NBKK-IDW17-AQ-012523	WATER	1/25/2023	1/30/2023
D2272-FS	NBKK-IDW18-AQ-012523	WATER	1/25/2023	1/30/2023
D2273-FS	NBKK-IDW19-AQ-012523	WATER	1/25/2023	1/30/2023
D2274-FS	NBKK-IDW20-AQ-012523	WATER	1/25/2023	1/30/2023

Work Plan

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WORK/QUALITY ASSURANCE PROJECT PLAN

1.0 GENERAL PROJECT INFORMATION

Project Title:	CTO-4117: NBK Keyport PFAS in water
Project Number:	G25161.X1.XX.0026.000001
Client:	CH2M 5701 Cleveland Street Suite 200 Virginia Beach, VA 23462 USA
Client Contact Information:	Juan Acaron Project Chemist (352) 331-8121(V) NA juan.acaron@jacobs.com
Effective Date of QAPP:	9/12/2022
Version Number:	G25161.X1.XX.0026.000001(L)-11
Project Manager:	Thorn, Jonathan
Laboratory Task Manager:	Thorn, Jonathan
Deliverable Due Date:	10/14/2022

2.0 SCOPE OF WORK

Overview:	Analysis of water samples for PFAS (18 Analytes)
Matrix:	Water

2.1 TECHNICAL APPROACH

2.1.1 Sample Receipt, Storage, and Handling

The list of samples for this project plan are presented in Attachment 1.

Storage Directions:	Store refrigerated.
Sub_Sampling:	None
Procedures:	NA
Contact:	NA
Comment:	NA
Archiving:	Dispose of excess samples after six months.
Disposal:	Dispose of excess samples in the appropriate waste stream.

2.1.2 Sample Preparation

None.

Samples Expected:	Samples Per Batch:	Batches Expected:
20	20	1

Batch quality control samples are defined in Table 1.

Target samples are presented in Attachment 1.

Table 1: Quality Control Samples

Type:	*Description:*	*Count:*	*Rgt:*	*Reference:*	*Comment:*
PB	Laboratory control reagent blank.	1 per batch	--	NA	
LCS	Laboratory Control Sample	1 per batch	No	NA	
MS	Spiked field sample for determining method accuracy in the presence of matrix.	1 per batch	--	NA	
MSD	Spiked field sample for determining method accuracy and precision in the presence of matrix.	1 per batch	--	NA	

2.1.3 Extraction/Preparation

2.1.3.1 Extraction

SOP No.-Rev: **5-370-13**

SOP Title: *Extraction of Poly and Perfluoroalkyl Substances from Environmental Matrices*

Sample Size: 250.00 ml

SIS and LCS/MS Compounds: Defined in Table 2.

Deviations: None.

Comments: None.

Table 2: SIS and LCS/MS Spiking Level

Standard Type	Standard Contents		Spike Amount (ng)	Volume (uL)	Comment
PFAS DoD Surrogate (18 Targets)	LS23	SIS	~ 25.0 ng	50 uL	NA
PFAS DoD Second Source LCS/MS (18 Analytes)	LR93	LCS/MS	~ 40 ng	100 uL	Vary spike between 25 and 150 µL

2.1.3.2 Cleanup

None.

RIS spiking levels are presented in Table 3.

Extract PIV (uL): 5000

Table 3: RIS Spiking Level

Standard Type	Standard Contents	Spike Amount (ng)	Volume (uL)	Comment
PFAS DoD Internal Standards	LS03 RIS	~ 25.0 ng	50 uL	NA

2.1.4 Instrumental Analysis

The list of analytes along with data quality criteria are presented in Attachment 2.

1) SOP_No-Rev: **5-369-09**

SOP_Title: *Analysis of Perfluoroalkyl Substances in Environmental Samples by Liquid Chromatography and Tandem Mass Spectrometry (LC-MS/MS)*

Deviations: None

Comments: None

2.2. DELIVERABLES

Deliverables Due:	10/14/2022
LIMS Reports:	*No*
Histograms:	*No*
Excel Tables:	*No*
EICs:	*No*
Chromatograms:	*No*
EDDs:	*No*
Comments:	• Individual data sets will be due 28 days after receipt of each sample set. • Select data sets have expedited TAT. • Full Level 4 data package (QSM 5.3 Table B-15 compliant) required. • CH2M EDD required. • WO 148003519

3.0 QUALITY

The Method Quality Objectives are defined in Attachment 3.

4.0 ORGANIZATION AND COMMUNICATION

4.1 ORGANIZATION

The project team is defined in Table 4. Supervisors may make substitutions with Project Manager concurrence.

Table 4: Project Team and Roles

Staff Member	Role	Comment
Jonathan R. Thorn	Project Manager	NA
Kelsey Harnden	Sample Preparation	NA
Denise M. Schumitz	LC-MS/MS Analysis	NA
Matt D. Schumitz	Sample Custody	NA
Carla R. Devine	Quality Control Officer	NA
Zachary J. Willenberg	Quality Assurance Officer	NA

4.2 COMMUNICATION

A kick-off meeting will be held to discuss project scope and goals.

5.0 SCHEDULE

The project schedule is presented in Table 5.

Table 5. Schedule of Laboratory Activities

Activity:	Start Date:	End Date:	TAT (days):	Comment:
Sample Receipt	09/12/2022	09/12/2022	0	NA
Sample Preparation	09/12/2022	09/30/2022	18	NA
Instrument Analysis	09/30/2022	10/13/2022	13	NA
Quality Control Review	10/13/2022	10/14/2022	1	NA
Quality Assurance Review	10/14/2022	10/14/2022	0	NA

6.0 BUDGET

The labor budget for the analytical task is presented in Table 6.

Table 6. Labor Budget (Laboratory Analytical Task)

Labor Activity:	Hours/ Batch:	Batches:	Total Hours:	Comment:
Sample Receipt	2	1	2	Hours per 12 samples
Sample Preparation	5	1	5	Hours per 12 samples
Instrument Analysis	5	1	5	Hours per 12 samples
Quality Control Review	2	1	2	1.5 hours per 12 samples
Quality Assurance Review	1	1	1	Hours per 12 samples

7.0 STAFF DEVELOPMENT

None anticipated.

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WORK/QUALITY ASSURANCE PROJECT PLAN

Attachment 1: Target Samples

Shipment: **SHP-220912-02**

Status: Pending

Description: NBK Keyport PFAS SI

Range: E6464-E6465

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	E6464	NBKK-B76-FB01-090122	09/01/2022 1:25 pm	AQ	R0119 (NA)			
2	E6465	NBKK-B76-EB01-090222-SO	09/02/2022 10:55 am	AQ	R0119 (NA)			

Shipment: **SHP-221004-07**

Status: Pending

Description: NBK Keyport

Range: E7805-E7808

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	E7805	NBKK-CF1-EB01-093022-SO	09/30/2022 10:33 am	WATER	R0119 (NA)			
2	E7808	NBKK-B1006-EB01-093022-SO	09/30/2022 12:25 pm	WATER	R0119 (NA)			

Shipment: **SHP-221011-05**

Status: Pending

Description: PNW PFAS SI NBK KEYPORT

Range: E8157-E8157

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	E8157	NBKK-LFEX-EB01-100422-SO	10/04/2022 3:20 pm	AQ	R0119 (NA)			

Shipment: **SHP-221013-06**

Status: Pending

Description: PNW PFAS SI NBK-KEYPART

Range: E8358-E8364

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	E8358	NBKK-LFEX-FB01-100622	10/06/2022 2:00 pm	WATER	R0119 (NA)			
2	E8364	NBKK-CF1-EB01-10082022-SO	10/08/2022 12:40 pm	WATER	R0119 (NA)			

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WORK/QUALITY ASSURANCE PROJECT PLAN

Shipment: **SHP-221019-07**

Status: Pending

Description: PNW PFAS SI NBK-Keyport

Range: E8544-E8545

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	E8544	NBKK-B1006-FB01-101122	10/11/2022 3:45 pm	WATER	R0119 (NA)			
2	E8545	NBKK-CF1-FB01-101322	10/13/2022 11:40 am	WATER	R0119 (NA)			

Shipment: **SHP-221028-01**

Status: Pending

Description: PNW PFAS SI NBK-KEYPORT

Range: E9287-E9290

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	E9290	NBKK-S7-FB01-102622	10/26/2022 2:00 pm	WATER	R0119 (NA)			

Shipment: **SHP-221031-02**

Status: Pending

Description: PNW PFAS SI NBK Keyport

Range: E9340-E9344

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	E9340	NBKK-IDW04-AQ-102722	10/27/2022 3:00 pm	WATER	R0119 (NA)			
2	E9344	NBKK-S7-EB01-102722-SO	10/27/2022 11:45 am	WATER	R0119 (NA)			

Shipment: **SHP-221110-02**

Status: Pending

Description: NBK Keyport

Range: E9772-E9774

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	E9772	NBKK-OU2A2-EB01-110722-SO	11/07/2022 10:55 am	AQ	R0119 (NA)			
2	E9774	NBKK-OU2A2-FB01-110822-SO	11/08/2022 10:30 am	AQ	R0119 (NA)			

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WORK/QUALITY ASSURANCE PROJECT PLAN

Shipment: **SHP-221111-04**

Status: Pending

Description: NBK Keyport

Range: E9844-E9850

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	E9844	NBKK-LFEX-MW03-1122	11/10/2022 11:30 am	WATER	R0119 (NA)			
2	E9845	NBKK-B1006-MW02-1122	11/09/2022 11:50 am	WATER	R0119 (NA)			
3	E9846	NBKK-LFEX-MW02-1122	11/10/2022 12:30 pm	WATER	R0119 (NA)			
4	E9847	NBKK-LFEX-MW04-1122	11/10/2022 10:05 am	WATER	R0119 (NA)			
5	E9848	NBKK-LFEX-MW01-1122	11/10/2022 9:20 am	WATER	R0119 (NA)			
6	E9849	NBKK-B1006-MW01-1122	11/09/2022 10:40 am	WATER	R0119 (NA)			
7	E9850	NBKK-B1006-MW03-1122	11/09/2022 1:20 pm	WATER	R0119 (NA)			

Shipment: **SHP-221115-01**

Status: Pending

Description: NBK KEYPORT

Range: D0005-D0012

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	D0005	NBKK-B76-EB01-111122-GW	11/11/2022 2:40 pm	AQ	R0119 (NA)			
2	D0006	NBKK-CF1-MW02-1122	11/14/2022 11:00 am	AQ	R0119 (NA)			
3	D0007	NBKK-CF1-EB01-111122-GW	11/11/2022 12:00 am	AQ	R0119 (NA)			
4	D0008	NBKK-B76-MW01-1122	11/11/2022 9:50 am	AQ	R0119 (NA)			
5	D0009	NBKK-B76-MW02-1122	11/11/2022 10:55 am	AQ	R0119 (NA)			
6	D0010	NBKK-CF1-MW03-1122	11/11/2022 2:20 pm	AQ	R0119 (NA)			
7	D0011	NBKK-B76-MW04-1122	11/10/2022 2:35 pm	AQ	R0119 (NA)			
8	D0012	NBKK-B76-MW03-1122	11/11/2022 11:50 am	AQ	R0119 (NA)			

Shipment: **SHP-221205-01**

Status: Pending

Description: NBKK-PFAS SI

Range: D0597-D0607

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	D0597	NBKK-OU2A5-MW01-1222	12/01/2022 2:50 pm	AQ	R0119 (NA)			
2	D0598	NBKK-OU2A5-MW03-1222	12/01/2022 3:25 pm	AQ	R0119 (NA)			

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WORK/QUALITY ASSURANCE PROJECT PLAN

Shipment: **SHP-221205-01**

Status: Pending

Description: NBKK-PFAS SI

Range: D0597-D0607

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
3	D0599	NBKK-S7-MW02-1222	12/02/2022 11:15 am	AQ	R0119 (NA)			
4	D0600	NBKK-S7-MW02-1222-MS	12/02/2022 11:15 am	AQ	R0119 (NA)			
5	D0601	NBKK-S7-MW02-1222-MSD	12/02/2022 11:15 am	AQ	R0119 (NA)			
6	D0602	NBKK-S7-MW05-1222	12/02/2022 11:40 am	AQ	R0119 (NA)			
7	D0603	NBKK-S7-MW05P-1222	12/02/2022 11:45 am	AQ	R0119 (NA)			
8	D0604	NBKK-S7-FB-120222	12/02/2022 2:30 pm	AQ	R0119 (NA)			
9	D0605	NBKK-S7-MW04-1222	12/02/2022 2:10 pm	AQ	R0119 (NA)			
10	D0606	NBKK-S7-MW01-1222	12/02/2022 3:35 pm	AQ	R0119 (NA)			
11	D0607	NBKK-OU2A5-FB-120222	12/02/2022 3:30 pm	AQ	R0119 (NA)			

Shipment: **SHP-221212-03**

Status: Pending

Description: NBK Keyport

Range: D0829-D0842

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	D0829	NBKK-OU2A2-MW03-1222-MSD	12/08/2022 1:30 pm	AQ	R0119 (NA)			
2	D0830	NBKK-OU2A2-MW06-1222	12/08/2022 9:45 am	AQ	R0119 (NA)			
3	D0831	NBKK-OU2A2-MW02-1222	12/08/2022 2:45 pm	AQ	R0119 (NA)			
4	D0832	NBKK-OU2A2-MW2-8-1222	12/08/2022 11:30 am	AQ	R0119 (NA)			
5	D0833	NBKK-OU2A2-MW2-8-EB01-1222	12/08/2022 11:35 am	AQ	R0119 (NA)			
6	D0834	NBKK-OU2A2-MW03-1222-MS	12/08/2022 1:30 pm	AQ	R0119 (NA)			
7	D0835	NBKK-OU2A2-MW03P-1222	12/08/2022 1:35 pm	AQ	R0119 (NA)			
8	D0836	NBKK-OU2A2-MW03-1222	12/08/2022 1:30 pm	AQ	R0119 (NA)			
9	D0837	NBKK-CF1-MW01-1222	12/07/2022 2:00 pm	AQ	R0119 (NA)			
10	D0838	NBKK-OU2A5-MW02-1222	12/07/2022 12:30 pm	AQ	R0119 (NA)			
11	D0839	NBKK-B1006-MW04-1222	12/08/2022 8:45 am	AQ	R0119 (NA)			
12	D0840	NBKK-B1006-MW04P-1222	12/08/2022 8:50 am	AQ	R0119 (NA)			
13	D0841	NBKK-OU2A2-MW05-1222	12/08/2022 12:40 pm	AQ	R0119 (NA)			

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WORK/QUALITY ASSURANCE PROJECT PLAN

Shipment: **SHP-221212-03**

Status: Pending

Description: NBK Keyport

Range: D0829-D0842

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
14	D0842	NBKK-OU2A2-MW04-1222	12/08/2022 10:45 am	AQ	R0119 (NA)			

Shipment: **SHP-230131-01**

Status: Pending

Description: NBK Keyport

Range: D2265-D2274

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	D2265	NBKK-IDW11-AQ-012523	01/25/2023 1:00 pm	WATER	R0119 (NA)			
2	D2266	NBKK-IDW12-AQ-012523	01/25/2023 1:15 pm	WATER	R0119 (NA)			
3	D2267	NBKK-IDW13-AQ-012523	01/25/2023 1:30 pm	WATER	R0119 (NA)			
4	D2268	NBKK-IDW14-AQ-012523	01/25/2023 1:45 pm	WATER	R0119 (NA)			
5	D2269	NBKK-IDW15-AQ-012523	01/25/2023 12:45 pm	WATER	R0119 (NA)			
6	D2270	NBKK-IDW16-AQ-012523	01/25/2023 12:30 pm	WATER	R0119 (NA)			
7	D2271	NBKK-IDW17-AQ-012523	01/25/2023 12:15 pm	WATER	R0119 (NA)			
8	D2272	NBKK-IDW18-AQ-012523	01/25/2023 12:00 pm	WATER	R0119 (NA)			
9	D2273	NBKK-IDW19-AQ-012523	01/25/2023 11:45 am	WATER	R0119 (NA)			
10	D2274	NBKK-IDW20-AQ-012523	01/25/2023 11:20 am	WATER	R0119 (NA)			

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WORK/QUALITY ASSURANCE PROJECT PLAN

Attachment 2: Test Codes

Project Test Code Name:	Master_369D
SOP Reference:	5-369 - Analysis of Perfluoroalkyl Substances in Environmental Samples by Liquid Chromatography and Tandem Mass Spectrometry (LC-MS/MS)
Description:	PFAS by DoD QSM 5.3 Table B-15
Matrix:	L - Liquid Samples, like water or sea water, prepared and anlyzed under the same class of detection limits.
Detection Limit Study:	5-369
Instrument:	LC-MS/MS
MQO Criteria:	Universal_LC
Standard Report:	Standard Result Report

Method Specific Reporting

Result Units:	ng/L	***Unit Conversion:***	(none)		
Weight Basis:	LIQUID	***Result Format:***	Fixed Digits		
Standard Basis:	SIS	***# of Figures/Digits:***	2		
Oil Weight Basis:	No	***Oil Weight Source:***	Oil Weight		
U-Value Substition:	U-Flag=MD	***Histograms:***	No		
ECD_Reporting:	No				

Holding Times (days)

Sample:	14
Frozen:	14
Extract:	28

Data Flags

DL_Flag:	U
RL_Flag:	J
PB_Flag:	B
DIL_Flag:	D
HT_Flag:	T

No:	Analyte:	Report Name:	Type	RIS	SIS	Hidden:	Graph:
1	Perfluoro-n-hexanoic acid	PFHxA	T		13C5-PFHxA	No	No
2	Perfluoro-n-heptanoic Acid	PFHpA	T		13C4-PFHpA	No	No
3	Perfluoro-n-octanoic Acid	PFOA	T		13C8-PFOA	No	No
4	Perfluorononanoic Acid	PFNA	T		13C9-PFNA	No	No
5	Perfluoro-n-decanoic Acid	PFDA	T		13C6-PFDA	No	No
6	Perfluoro-n-undecanoic acid	PFUnA	T		13C7-PFUnA	No	No
7	Perfluoro-n-dodecanoic acid	PFDoA	T		13C2-PFDoA	No	No
8	Perfluoro-n-tridecanoic acid	PFTrDA	T		13C2-PFTeDA	No	No
9	Perfluoro-n-tetradecanoic acid	PFTeDA	T		13C2-PFTeDA	No	No
10	N-methylperfluoro-1-octanesulfonamidoacetic acid	NMeFOSAA	T		d3-MeFOSAA	No	No
11	N-ethylperfluoro-octanesulfonamidoacetic acid	NEtFOSAA	T		d5-EtFOSAA	No	No
12	Perfluoro-1-butanesulfonate	PFBS	T		13C3-PFBS	No	No
13	Perfluoro-1-hexanesulfonate	PFHxS	T		13C3-PFHxS	No	No
14	Perfluoro-1-octanesulfonate	PFOS	T		13C8-PFOS	No	No
15	Hexafluoropropylene oxide dimer acid	HFPO-DA	T		13C3-HFPO-DA	No	No
16	Adona	Adona	T		13C8-PFOA	No	No
17	9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	9Cl-PF3ONS	T		13C8-PFOA	No	No

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WORK/QUALITY ASSURANCE PROJECT PLAN

Attachment 2: Test Codes

Project Test Code Name: Master_369D

No:	Analyte:	Report Name:	Type	RIS	SIS	Hidden:	Graph:
18	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	11Cl-PF3OUdS	T		13C8-PFOA	No	No
1	13C5-PFHxA	13C5-PFHxA	SIS	13C2-PFOA		No	No
2	13C4-PFHpA	13C4-PFHpA	SIS	13C2-PFOA		No	No
3	13C8-PFOA	13C8-PFOA	SIS	13C2-PFOA		No	No
4	13C9-PFNA	13C9-PFNA	SIS	13C2-PFOA		No	No
5	13C6-PFDA	13C6-PFDA	SIS	13C2-PFDA		No	No
6	13C7-PFUnA	13C7-PFUnA	SIS	13C2-PFDA		No	No
7	13C2-PFDoA	13C2-PFDoA	SIS	13C2-PFDA		No	No
8	13C2-PFTeDA	13C2-PFTeDA	SIS	13C2-PFDA		No	No
9	d3-MeFOSAA	d3-MeFOSAA	SIS	13C4-PFOS		No	No
10	d5-EtFOSAA	d5-EtFOSAA	SIS	13C4-PFOS		No	No
11	13C3-PFBS	13C3-PFBS	SIS	13C4-PFOS		No	No
12	13C3-PFHxS	13C3-PFHxS	SIS	13C4-PFOS		No	No
13	13C8-PFOS	13C8-PFOS	SIS	13C4-PFOS		No	No
14	13C3-HFPO-DA	13C3-HFPO-DA	SIS	13C2-PFOA		No	No

Total Analytes: 32

Subtract Peaks:

None

Sum Peaks:

None

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WORK/QUALITY ASSURANCE PROJECT PLAN

Attachment 2: Test Codes

Project Test Code Name: Master_369D

ICAL Acceptance Criteria:

Curve Fit:	Limit Mean(%):	Mean Qual:	Limit Ind.:	Ind. Qual:	Min Points:	Points Qual:	Comments:
Linear	NA	NA	0.99	N	5	N	y = Bx + C
Quadratic	NA	NA	0.99	N	6	N	y = Ax^2 + Bx + C

Continuing Calibration Verification Criteria:

CCV Name: 5-369

Frequency Hrs:		Mean PD(%):		Individual PD(%):		RIS/SIS RT Window (min):		Area Limit Low(%):	Area Limit High(%):		Comment:
12	(N)	30	(N)	30	(N)	0.04	(N)	-50	100	(N)	NA

Independent Calibration Verification:

ICC Name: 5-369

Mean PD Limit(%):		Ind. PD Limit(%):		RIS/SIS Window Limit (Secs):		Area Limit High(%):	Area Limit Low(%):		Comment:
30	(N)	30	(N)	0.04	(N)	-50	100	(N)	NA

Mass Discrimination Criteria:

None

Degredation Check Criteria:

None

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WORK/QUALITY ASSURANCE PROJECT PLAN

Attachment 3: Method Quality Objectives

MQO Application:	***Universal_LC***		
MQO:	**Acceptance Criteria:**	**Qual:**	**Corrective Action:**
Procedural Blank	Samples must be greater than five times the blank concentration (>5xPB).	B	Review with Project Manager; re-analyze or justify results in project records.
PB Measurement Quality Objective	Organic results in the Procedural Blank are less than 1/2 times the LOQ (<1/2xLOQ)	N	Review with Project Manager; re-analyze or justify results in project records.
Laboratory Control Sample	Recovery values 70-130%.	N	Review with project manager; re-analyze or justify reporting the results in project records.
Matrix Spike / Matrix Spike Duplicate Recovery	Organics 70-130%. Analyte concentration in MS/MSD must be greater than five times reported background concentration.	N	Review with Project Manager; re-analyze or justify reporting results in the project records.
	Organics Results in the Target is less than 5 times the Original	n	
Matrix Spike/Spike Duplicate Precision	Organics results less than 30% Relative Percent Difference (RPD). Analyte concentration in MS/MSD must be greater than five times reported background concentration.	N	Review with Project Manager; re-analyze or justify reporting results in the project records.
	Organics Results in the Target is less than 5 times the Original	n	
Standard Reference Material Accuracy	Organics Percent Difference less than 30% from a range of certified values on average. Analyte concentration must be greater than five times the Method Detection Limit (>5xMDL).	N	Review with Project Manager; re-analyze or justify reporting results in the project records.
	Organics Results in the Target is less than 5 times the MDL	n	
Analytical Duplicate Precision	Organics results less than 30% Relative Percent Difference (RPD). Analyte concentration must be > 5x MDL.	N	Review with Project Manager; re-analyze or justify reporting results in the project records.
	Organics Results in the Original is less than 5 times the MDL	n	

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WORK/QUALITY ASSURANCE PROJECT PLAN

Attachment 3: Method Quality Objectives

MQO Application:	*Universal_LC*		
MQO:	**Acceptance Criteria:**	**Qual:**	**Corrective Action:**
Analytical Triplicate Precision	Organics results less than 30% Relative Standard Deviation (RSD). Analyte concentration must be > 5x MDL. Organics Results in the Original is less than 5 times the MDL	N n	Review with Project Manager; re-analyze or justify reporting results in the project records.
Surrogate Compound Recovery	Recovery results between 50% and 150%.	N	Review with Project Manager; re-analyze or justify reporting results in the project records.
Control Oil	RPD < 30% for at least 90% of analytes	N	Results examined by project manager, task leader, or subcontractor lab manager. Reextraction, reanalysis, or justification documented.
Instrument Calibration	5-369-9: R-squared greater than or equal to 0.990		Results examined by project manager, task leader, or subcontractor lab manager. Reextraction, reanalysis, or justification documented.
Independent Calibration Check Solution	5-369-9: Individual PD less than or equal to 30%. Mean Percent Difference less than or equal to 30%.	N	Review with Project Manager; re-analyze or justify in project records.
Continuing Calibration Verification	5-369-9: Individual PD less than or equal to 30%. Mean Percent Difference less than or equal to 30%.	N	Review with Project Manager; re-analyze or justify in project records.

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ShpNo SHP-230131-01

Battelle Project No: 026.000001

Sample Receipt Form

Approved: ☐ Authorized ☐

Project Number: 704758CH **Client:** Jacobs

Received by: Schumitz, Matt **Date/Time Received:** Monday, January 30, 2023 9:00 AM

No. of Shipping Containers: 1

SHIPMENT

Method of Delivery: Commercial Carrier **Tracking Number:** Fed Ex

COC Forms: ☑ Shipped with samples ☐ No Forms

Cooler(s)/Box(es)

Cntr	Type	Tracking No.	Seal	Seal	Container	Therm.	Temp C	Smps
1 of 1	Cooler	3938 9889 6987	Custody Seals	Intact	Intact	Therm_1	4.2	10

Samples

Sample Labels:
☑ Sample labels agree with COC forms
☐ Discrepancies (see Sample Custody Corrective Action Form)

Container Seals:
☐ Tape ☐ Custody Seals ☐ Other Seals (See sample Log)
☑ Seals intact for each shipping container
☐ Seals broken (See sample log for impacted samples)

Condition of Samples:
☑ Sample containers intact
☐ Sample containers broken/leaking (See Custody Corrective Action Form)

Temperature upon receipt (°C): 4.2 Temperature Blank used ☑ Yes ☐ No
(Note: If temperature upon receipt differs from required conditions, see sample log comment field)

Samples Acidified: ☐ Yes ☐ No ☑ Unknown

Initial pH 5-9?: ☐ Yes ☐ No ☑ NA
If no, individual sample adjustments on the Auxiliary Sample Receipt Form

Total Residual Chlorine Present?: ☐ Yes ☐ No ☑ NA
If yes, individual sample adjustments on the Auxiliary Sample Receipt Form

Head Space <1% in samples for water VOC analysis: ☐ Yes ☐ No ☑ NA
Individual sample deviations noted on sample log

Samples Containers:
Samples returned in PC-grade jars: ☐ Yes ☐ No ☑ Unknown /Lot No.: Unknown

Storage Location: Custody: Refrigerator - R0119 (NA) **BDO IDs Assigned:** D2265 - D2274

Samples logged in by: Schumitz, Matt **Date/Time:** 01/30/2023 9:00 AM

Approved By: **Approved On:**

Authorized By: **Authorized On:**

BATTELLE

It can be done

ShpNo SHP-230131-01

Battelle Project No: 026.000001

Sample Receipt Form Details

Approved: ☐ Authorized ☐

Project Number: 704758CH **Client:** Jacobs

Received by: Schumitz, Matt **Date/Time Received:** Monday, January 30, 2023 9:00 AM

No. of Shipping Containers: 1

BDO Id:	Client Sample ID:	Collection Date:	Login Date:	Ctrs:	Matrix:	Temp:	pH:	TRC:	VOC:	Stored In:	Loc:	No:	Comments:
D2265	NBKK-IDW11-AQ-012523	01/25/23 13:00	01/31/23 8:49	2	WATER	4.2	NA	NA	NA	R0119 (NA)			
D2266	NBKK-IDW12-AQ-012523	01/25/23 13:15	01/31/23 8:49	2	WATER	4.2	NA	NA	NA	R0119 (NA)			
D2267	NBKK-IDW13-AQ-012523	01/25/23 13:30	01/31/23 8:49	2	WATER	4.2	NA	NA	NA	R0119 (NA)			
D2268	NBKK-IDW14-AQ-012523	01/25/23 13:45	01/31/23 8:49	2	WATER	4.2	NA	NA	NA	R0119 (NA)			
D2269	NBKK-IDW15-AQ-012523	01/25/23 12:45	01/31/23 8:49	2	WATER	4.2	NA	NA	NA	R0119 (NA)			
D2270	NBKK-IDW16-AQ-012523	01/25/23 12:30	01/31/23 8:49	2	WATER	4.2	NA	NA	NA	R0119 (NA)			
D2271	NBKK-IDW17-AQ-012523	01/25/23 12:15	01/31/23 8:49	2	WATER	4.2	NA	NA	NA	R0119 (NA)			
D2272	NBKK-IDW18-AQ-012523	01/25/23 12:00	01/31/23 8:50	2	WATER	4.2	NA	NA	NA	R0119 (NA)			
D2273	NBKK-IDW19-AQ-012523	01/25/23 11:45	01/31/23 8:50	2	WATER	4.2	NA	NA	NA	R0119 (NA)			
D2274	NBKK-IDW20-AQ-012523	01/25/23 11:20	01/31/23 8:50	2	WATER	4.2	NA	NA	NA	R0119 (NA)			

Total Samples: 10

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Chain of Custody

Project Name: NBK Keyport	**Client Project Manager:** Rachel Clennan	**Client Project Number:** 704758 CH
Deliver Results to: Rachel Clennan	**Samples Collected by:** Tim Anderson	
Address:	**Phone:** 702 686 7448	
	Email: tim.anderson100@jacobs.com	
Phone: 978 387 8171	**Time Zone:** Pacific	
Email: Rachel.Clennan@jacobs.com	**PO reference:**	

Test / Preservative[1]: PFAS

COC Number:

Turnaround Time[2]:
- ☐ 28-days (standard)
- ☐ 21-days (Rush)
- ☒ 14-days (Rush)
- ☐ 7-days (Rush)
- ☐ 3-day (Rush)

Sample ID	Date	Time	Type[3]	Matrix	Count	Lab ID	PFAS	Sample Comments
NBKK-IDW11-AQ-012523	1-25-23	1300		water	2	D2265	X	
NBKK-IDW12-AQ-012523		1315	1315			66	X	
NBKK-IDW13-AQ-012523		1330				67	X	
NBKK-IDW14-AQ-012523		1345				68	X	
NBKK-IDW15-AQ-012523		1245				69	X	
NBKK-IDW16-AQ-012523		1230				70	X	
NBKK-IDW17-AQ-012523		1215				71	X	
NBKK-IDW18-AQ-012523		1200				72	X	
NBKK-IDW19-AQ-012523		1145				73	X	
NBKK-IDW20-AQ-012523		1120				D2274	X	

Relinquished by (Print/Sign): Tim Anderson	Company: Jacobs	Date/Time: 1-26-23 1700	Received by (Print/Sign):	Company: BNO	Date/Time: 1/30/23 900
Relinquished by (Print/Sign):	Company:	Date/Time:	Received by (Print/Sign):	Company:	Date/Time:
Relinquished by (Print/Sign):	Company:	Date/Time:	Received by (Print/Sign):	Company:	Date/Time:

Field Project comments:

Receipt comments:

[1] include comments in the Field Project comment field if there are method specific requirements, i.e., "WHO PCB Congener list", "PFAS – 18 analytes", or "PFAS – 29 analytes from UCMR5"

[2] Rush TAT request should be verified with the lab prior to submitting samples

[3] Client sample type, if applicable

Do not lift using this tag.

ORIGIN ID:PWTA (000) 000-0000

JACOBS
STE 200 SUITE 200
5701 CLEVELAND ST STE 200
VIRGINIA BEACH, VA 23462
UNITED STATES US

SHIP DATE: 26JAN23
ACTWGT: 32.45 LB
CAD: 6992270/SSF02341
DIMS: 26x14x14 IN

BILL THIRD PARTY

TO BATTELL ANALYTICAL SERVICES
ATN:JONATHON THORN
141 LONGWATER DRIVE STE 202

NORWELL MA 02061
(781) 681-5565
INV:
PO:
REF:
DEPT:

1/30/23 900
Thorn !
4.2

Part # 1…-435 RRDB2 EXP 11/23

FedEx
Express
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TRK# 0201 3938 9889 6987

FRI - 27 JAN 10:30A
PRIORITY OVERNIGHT

XE XPUA

AHS
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246 1 B
B02 10:30 6987
01 30

Data Tables

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It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-IDW11-AQ-012523
Battelle ID	D2265-FS
Sample Type	SA
Collection Date	01/25/2023
Extraction Date	02/08/2023
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	NA
Matrix	WATER
Sample Size	0.292
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	47.1	D2265-FS(0)	1.000	2/11/2023	0.782	2.14	4.28
PFHpA	375-85-9	26.3	D2265-FS(0)	1.000	2/11/2023	0.806	2.14	4.28
PFOA	335-67-1	20.4	D2265-FS(0)	1.000	2/11/2023	0.865	2.14	4.28
PFNA	375-95-1	6.07	D2265-FS(0)	1.000	2/11/2023	0.713	2.14	4.28
PFDA	335-76-2	1.85 J	D2265-FS(0)	1.000	2/11/2023	0.671	2.14	4.28
PFUnA	2058-94-8	0.966 J	D2265-FS(0)	1.000	2/11/2023	0.644	2.14	4.28
PFDoA	307-55-1	2.14 U	D2265-FS(0)	1.000	2/11/2023	0.651	2.14	4.28
PFTrDA	72629-94-8	2.14 U	D2265-FS(0)	1.000	2/11/2023	0.635	2.14	4.28
PFTeDA	376-06-7	2.14 U	D2265-FS(0)	1.000	2/11/2023	0.677	2.14	4.28
NMeFOSAA	2355-31-9	2.14 U	D2265-FS(0)	1.000	2/11/2023	0.882	2.14	4.28
NEtFOSAA	2991-50-6	2.14 U	D2265-FS(0)	1.000	2/11/2023	0.848	2.14	4.28
PFBS	375-73-5	3.74 J	D2265-FS(0)	1.000	2/11/2023	0.741	2.14	4.28
PFHxS	355-46-4	21.0	D2265-FS(0)	1.000	2/11/2023	0.854	2.14	4.28
PFOS	1763-23-1	208	D2265-FS(0)	1.000	2/11/2023	0.916	2.14	4.28
HFPO-DA	13252-13-6	2.14 U	D2265-FS(0)	1.000	2/11/2023	0.741	2.14	4.28
Adona	919005-14-4	2.14 U	D2265-FS(0)	1.000	2/11/2023	0.744	2.14	4.28
9Cl-PF3ONS	756426-58-1	2.14 U	D2265-FS(0)	1.000	2/11/2023	0.882	2.14	4.28
11Cl-PF3OUdS	763051-92-9	2.14 U	D2265-FS(0)	1.000	2/11/2023	0.771	2.14	4.28

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It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-IDW11-AQ-012523
Battelle ID	D2265-FS
Sample Type	SA
Collection Date	01/25/2023
Extraction Date	02/08/2023
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS

Surrogate Recoveries (%)	Recovery	Extract ID	Analysis Date
13C5-PFHxA	128	D2265-FS(0)	2/11/2023
13C4-PFHpA	129	D2265-FS(0)	2/11/2023
13C8-PFOA	121	D2265-FS(0)	2/11/2023
13C9-PFNA	131	D2265-FS(0)	2/11/2023
13C6-PFDA	117	D2265-FS(0)	2/11/2023
13C7-PFUnA	104	D2265-FS(0)	2/11/2023
13C2-PFDoA	132	D2265-FS(0)	2/11/2023
13C2-PFTeDA	101	D2265-FS(0)	2/11/2023
d3-MeFOSAA	126	D2265-FS(0)	2/11/2023
d5-EtFOSAA	89	D2265-FS(0)	2/11/2023
13C3-PFBS	141	D2265-FS(0)	2/11/2023
13C3-PFHxS	117	D2265-FS(0)	2/11/2023
13C8-PFOS	136	D2265-FS(0)	2/11/2023
13C3-HFPO-DA	124	D2265-FS(0)	2/11/2023

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-IDW12-AQ-012523
Battelle ID	D2266-FS
Sample Type	SA
Collection Date	01/25/2023
Extraction Date	02/08/2023
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	NA
Matrix	WATER
Sample Size	0.285
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)		Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	2.19	U	D2266-FS(0)	1.000	2/11/2023	0.801	2.19	4.39
PFHpA	375-85-9	2.19	U	D2266-FS(0)	1.000	2/11/2023	0.825	2.19	4.39
PFOA	335-67-1	2.19	U	D2266-FS(0)	1.000	2/11/2023	0.886	2.19	4.39
PFNA	375-95-1	2.19	U	D2266-FS(0)	1.000	2/11/2023	0.731	2.19	4.39
PFDA	335-76-2	2.19	U	D2266-FS(0)	1.000	2/11/2023	0.688	2.19	4.39
PFUnA	2058-94-8	2.19	U	D2266-FS(0)	1.000	2/11/2023	0.660	2.19	4.39
PFDoA	307-55-1	2.19	U	D2266-FS(0)	1.000	2/11/2023	0.667	2.19	4.39
PFTrDA	72629-94-8	2.19	U	D2266-FS(0)	1.000	2/11/2023	0.651	2.19	4.39
PFTeDA	376-06-7	2.19	U	D2266-FS(0)	1.000	2/11/2023	0.694	2.19	4.39
NMeFOSAA	2355-31-9	2.19	U	D2266-FS(0)	1.000	2/11/2023	0.904	2.19	4.39
NEtFOSAA	2991-50-6	2.19	U	D2266-FS(0)	1.000	2/11/2023	0.868	2.19	4.39
PFBS	375-73-5	2.19	U	D2266-FS(0)	1.000	2/11/2023	0.760	2.19	4.39
PFHxS	355-46-4	2.19	U	D2266-FS(0)	1.000	2/11/2023	0.875	2.19	4.39
PFOS	1763-23-1	2.19	U	D2266-FS(0)	1.000	2/11/2023	0.939	2.19	4.39
HFPO-DA	13252-13-6	2.19	U	D2266-FS(0)	1.000	2/11/2023	0.759	2.19	4.39
Adona	919005-14-4	2.19	U	D2266-FS(0)	1.000	2/11/2023	0.762	2.19	4.39
9Cl-PF3ONS	756426-58-1	2.19	U	D2266-FS(0)	1.000	2/11/2023	0.904	2.19	4.39
11Cl-PF3OUdS	763051-92-9	2.19	U	D2266-FS(0)	1.000	2/11/2023	0.790	2.19	4.39

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-IDW12-AQ-012523
Battelle ID	D2266-FS
Sample Type	SA
Collection Date	01/25/2023
Extraction Date	02/08/2023
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS

Surrogate Recoveries (%)	Recovery	Extract ID	Analysis Date
13C5-PFHxA	116	D2266-FS(0)	2/11/2023
13C4-PFHpA	115	D2266-FS(0)	2/11/2023
13C8-PFOA	119	D2266-FS(0)	2/11/2023
13C9-PFNA	118	D2266-FS(0)	2/11/2023
13C6-PFDA	119	D2266-FS(0)	2/11/2023
13C7-PFUnA	115	D2266-FS(0)	2/11/2023
13C2-PFDoA	101	D2266-FS(0)	2/11/2023
13C2-PFTeDA	89	D2266-FS(0)	2/11/2023
d3-MeFOSAA	101	D2266-FS(0)	2/11/2023
d5-EtFOSAA	142	D2266-FS(0)	2/11/2023
13C3-PFBS	107	D2266-FS(0)	2/11/2023
13C3-PFHxS	103	D2266-FS(0)	2/11/2023
13C8-PFOS	116	D2266-FS(0)	2/11/2023
13C3-HFPO-DA	117	D2266-FS(0)	2/11/2023

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-IDW13-AQ-012523
Battelle ID	D2267-FS
Sample Type	SA
Collection Date	01/25/2023
Extraction Date	02/08/2023
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	NA
Matrix	WATER
Sample Size	0.244
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	2.56 U	D2267-FS(0)	1.000	2/11/2023	0.935	2.56	5.12
PFHpA	375-85-9	2.56 U	D2267-FS(0)	1.000	2/11/2023	0.964	2.56	5.12
PFOA	335-67-1	2.56 U	D2267-FS(0)	1.000	2/11/2023	1.03	2.56	5.12
PFNA	375-95-1	2.56 U	D2267-FS(0)	1.000	2/11/2023	0.853	2.56	5.12
PFDA	335-76-2	2.56 U	D2267-FS(0)	1.000	2/11/2023	0.803	2.56	5.12
PFUnA	2058-94-8	2.56 U	D2267-FS(0)	1.000	2/11/2023	0.770	2.56	5.12
PFDoA	307-55-1	2.56 U	D2267-FS(0)	1.000	2/11/2023	0.779	2.56	5.12
PFTrDA	72629-94-8	2.56 U	D2267-FS(0)	1.000	2/11/2023	0.760	2.56	5.12
PFTeDA	376-06-7	2.56 U	D2267-FS(0)	1.000	2/11/2023	0.810	2.56	5.12
NMeFOSAA	2355-31-9	2.56 U	D2267-FS(0)	1.000	2/11/2023	1.06	2.56	5.12
NEtFOSAA	2991-50-6	2.56 U	D2267-FS(0)	1.000	2/11/2023	1.01	2.56	5.12
PFBS	375-73-5	2.56 U	D2267-FS(0)	1.000	2/11/2023	0.887	2.56	5.12
PFHxS	355-46-4	2.56 U	D2267-FS(0)	1.000	2/11/2023	1.02	2.56	5.12
PFOS	1763-23-1	2.56 U	D2267-FS(0)	1.000	2/11/2023	1.10	2.56	5.12
HFPO-DA	13252-13-6	2.56 U	D2267-FS(0)	1.000	2/11/2023	0.886	2.56	5.12
Adona	919005-14-4	2.56 U	D2267-FS(0)	1.000	2/11/2023	0.890	2.56	5.12
9Cl-PF3ONS	756426-58-1	2.56 U	D2267-FS(0)	1.000	2/11/2023	1.06	2.56	5.12
11Cl-PF3OUdS	763051-92-9	2.56 U	D2267-FS(0)	1.000	2/11/2023	0.923	2.56	5.12

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-IDW13-AQ-012523
Battelle ID	D2267-FS
Sample Type	SA
Collection Date	01/25/2023
Extraction Date	02/08/2023
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS

Surrogate Recoveries (%)	Recovery	Extract ID	Analysis Date
13C5-PFHxA	111	D2267-FS(0)	2/11/2023
13C4-PFHpA	110	D2267-FS(0)	2/11/2023
13C8-PFOA	113	D2267-FS(0)	2/11/2023
13C9-PFNA	113	D2267-FS(0)	2/11/2023
13C6-PFDA	110	D2267-FS(0)	2/11/2023
13C7-PFUnA	102	D2267-FS(0)	2/11/2023
13C2-PFDoA	88	D2267-FS(0)	2/11/2023
13C2-PFTeDA	72	D2267-FS(0)	2/11/2023
d3-MeFOSAA	114	D2267-FS(0)	2/11/2023
d5-EtFOSAA	98	D2267-FS(0)	2/11/2023
13C3-PFBS	109	D2267-FS(0)	2/11/2023
13C3-PFHxS	109	D2267-FS(0)	2/11/2023
13C8-PFOS	117	D2267-FS(0)	2/11/2023
13C3-HFPO-DA	112	D2267-FS(0)	2/11/2023

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-IDW14-AQ-012523
Battelle ID	D2268-FS
Sample Type	SA
Collection Date	01/25/2023
Extraction Date	02/08/2023
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	NA
Matrix	WATER
Sample Size	0.266
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	2.35 U	D2268-FS(0)	1.000	2/11/2023	0.858	2.35	4.70
PFHpA	375-85-9	2.35 U	D2268-FS(0)	1.000	2/11/2023	0.884	2.35	4.70
PFOA	335-67-1	2.35 U	D2268-FS(0)	1.000	2/11/2023	0.949	2.35	4.70
PFNA	375-95-1	2.35 U	D2268-FS(0)	1.000	2/11/2023	0.783	2.35	4.70
PFDA	335-76-2	2.35 U	D2268-FS(0)	1.000	2/11/2023	0.737	2.35	4.70
PFUnA	2058-94-8	2.35 U	D2268-FS(0)	1.000	2/11/2023	0.707	2.35	4.70
PFDoA	307-55-1	2.35 U	D2268-FS(0)	1.000	2/11/2023	0.714	2.35	4.70
PFTrDA	72629-94-8	2.35 U	D2268-FS(0)	1.000	2/11/2023	0.697	2.35	4.70
PFTeDA	376-06-7	2.35 U	D2268-FS(0)	1.000	2/11/2023	0.743	2.35	4.70
NMeFOSAA	2355-31-9	2.35 U	D2268-FS(0)	1.000	2/11/2023	0.968	2.35	4.70
NEtFOSAA	2991-50-6	2.35 U	D2268-FS(0)	1.000	2/11/2023	0.930	2.35	4.70
PFBS	375-73-5	2.35 U	D2268-FS(0)	1.000	2/11/2023	0.814	2.35	4.70
PFHxS	355-46-4	2.23 J	D2268-FS(0)	1.000	2/11/2023	0.937	2.35	4.70
PFOS	1763-23-1	2.35 U	D2268-FS(0)	1.000	2/11/2023	1.01	2.35	4.70
HFPO-DA	13252-13-6	2.35 U	D2268-FS(0)	1.000	2/11/2023	0.813	2.35	4.70
Adona	919005-14-4	2.35 U	D2268-FS(0)	1.000	2/11/2023	0.817	2.35	4.70
9Cl-PF3ONS	756426-58-1	2.35 U	D2268-FS(0)	1.000	2/11/2023	0.968	2.35	4.70
11Cl-PF3OUdS	763051-92-9	2.35 U	D2268-FS(0)	1.000	2/11/2023	0.847	2.35	4.70

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-IDW14-AQ-012523
Battelle ID	D2268-FS
Sample Type	SA
Collection Date	01/25/2023
Extraction Date	02/08/2023
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS

Surrogate Recoveries (%)	Recovery	Extract ID	Analysis Date
13C5-PFHxA	114	D2268-FS(0)	2/11/2023
13C4-PFHpA	111	D2268-FS(0)	2/11/2023
13C8-PFOA	115	D2268-FS(0)	2/11/2023
13C9-PFNA	118	D2268-FS(0)	2/11/2023
13C6-PFDA	119	D2268-FS(0)	2/11/2023
13C7-PFUnA	107	D2268-FS(0)	2/11/2023
13C2-PFDoA	102	D2268-FS(0)	2/11/2023
13C2-PFTeDA	89	D2268-FS(0)	2/11/2023
d3-MeFOSAA	109	D2268-FS(0)	2/11/2023
d5-EtFOSAA	108	D2268-FS(0)	2/11/2023
13C3-PFBS	108	D2268-FS(0)	2/11/2023
13C3-PFHxS	106	D2268-FS(0)	2/11/2023
13C8-PFOS	116	D2268-FS(0)	2/11/2023
13C3-HFPO-DA	114	D2268-FS(0)	2/11/2023

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-IDW15-AQ-012523
Battelle ID	D2269-FS
Sample Type	SA
Collection Date	01/25/2023
Extraction Date	02/08/2023
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	NA
Matrix	WATER
Sample Size	0.280
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)		Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	2.23	U	D2269-FS(0)	1.000	2/11/2023	0.815	2.23	4.46
PFHpA	375-85-9	2.23	U	D2269-FS(0)	1.000	2/11/2023	0.840	2.23	4.46
PFOA	335-67-1	2.23	U	D2269-FS(0)	1.000	2/11/2023	0.902	2.23	4.46
PFNA	375-95-1	2.23	U	D2269-FS(0)	1.000	2/11/2023	0.744	2.23	4.46
PFDA	335-76-2	2.23	U	D2269-FS(0)	1.000	2/11/2023	0.700	2.23	4.46
PFUnA	2058-94-8	2.23	U	D2269-FS(0)	1.000	2/11/2023	0.671	2.23	4.46
PFDoA	307-55-1	2.23	U	D2269-FS(0)	1.000	2/11/2023	0.679	2.23	4.46
PFTrDA	72629-94-8	2.23	U	D2269-FS(0)	1.000	2/11/2023	0.663	2.23	4.46
PFTeDA	376-06-7	2.23	U	D2269-FS(0)	1.000	2/11/2023	0.706	2.23	4.46
NMeFOSAA	2355-31-9	2.23	U	D2269-FS(0)	1.000	2/11/2023	0.920	2.23	4.46
NEtFOSAA	2991-50-6	2.23	U	D2269-FS(0)	1.000	2/11/2023	0.884	2.23	4.46
PFBS	375-73-5	2.23	U	D2269-FS(0)	1.000	2/11/2023	0.773	2.23	4.46
PFHxS	355-46-4	1.33	J	D2269-FS(0)	1.000	2/11/2023	0.890	2.23	4.46
PFOS	1763-23-1	2.23	U	D2269-FS(0)	1.000	2/11/2023	0.955	2.23	4.46
HFPO-DA	13252-13-6	2.23	U	D2269-FS(0)	1.000	2/11/2023	0.772	2.23	4.46
Adona	919005-14-4	2.23	U	D2269-FS(0)	1.000	2/11/2023	0.776	2.23	4.46
9Cl-PF3ONS	756426-58-1	2.23	U	D2269-FS(0)	1.000	2/11/2023	0.920	2.23	4.46
11Cl-PF3OUdS	763051-92-9	2.23	U	D2269-FS(0)	1.000	2/11/2023	0.804	2.23	4.46

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-IDW15-AQ-012523
Battelle ID	D2269-FS
Sample Type	SA
Collection Date	01/25/2023
Extraction Date	02/08/2023
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS

Surrogate Recoveries (%)	Recovery	Extract ID	Analysis Date
13C5-PFHxA	119	D2269-FS(0)	2/11/2023
13C4-PFHpA	117	D2269-FS(0)	2/11/2023
13C8-PFOA	129	D2269-FS(0)	2/11/2023
13C9-PFNA	126	D2269-FS(0)	2/11/2023
13C6-PFDA	117	D2269-FS(0)	2/11/2023
13C7-PFUnA	109	D2269-FS(0)	2/11/2023
13C2-PFDoA	88	D2269-FS(0)	2/11/2023
13C2-PFTeDA	84	D2269-FS(0)	2/11/2023
d3-MeFOSAA	108	D2269-FS(0)	2/11/2023
d5-EtFOSAA	108	D2269-FS(0)	2/11/2023
13C3-PFBS	109	D2269-FS(0)	2/11/2023
13C3-PFHxS	106	D2269-FS(0)	2/11/2023
13C8-PFOS	130	D2269-FS(0)	2/11/2023
13C3-HFPO-DA	123	D2269-FS(0)	2/11/2023

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-IDW16-AQ-012523
Battelle ID	D2270-FS
Sample Type	SA
Collection Date	01/25/2023
Extraction Date	02/08/2023
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	NA
Matrix	WATER
Sample Size	0.261
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	19.4	D2270-FS(0)	1.000	2/11/2023	0.875	2.39	4.79
PFHpA	375-85-9	11.2	D2270-FS(0)	1.000	2/11/2023	0.901	2.39	4.79
PFOA	335-67-1	15.8	D2270-FS(0)	1.000	2/11/2023	0.967	2.39	4.79
PFNA	375-95-1	1.42 J	D2270-FS(0)	1.000	2/11/2023	0.798	2.39	4.79
PFDA	335-76-2	2.39 U	D2270-FS(0)	1.000	2/11/2023	0.751	2.39	4.79
PFUnA	2058-94-8	2.39 U	D2270-FS(0)	1.000	2/11/2023	0.720	2.39	4.79
PFDoA	307-55-1	2.39 U	D2270-FS(0)	1.000	2/11/2023	0.728	2.39	4.79
PFTrDA	72629-94-8	2.39 U	D2270-FS(0)	1.000	2/11/2023	0.711	2.39	4.79
PFTeDA	376-06-7	2.39 U	D2270-FS(0)	1.000	2/11/2023	0.758	2.39	4.79
NMeFOSAA	2355-31-9	2.39 U	D2270-FS(0)	1.000	2/11/2023	0.987	2.39	4.79
NEtFOSAA	2991-50-6	2.39 U	D2270-FS(0)	1.000	2/11/2023	0.948	2.39	4.79
PFBS	375-73-5	2.17 J	D2270-FS(0)	1.000	2/11/2023	0.830	2.39	4.79
PFHxS	355-46-4	32.7	D2270-FS(0)	1.000	2/11/2023	0.955	2.39	4.79
PFOS	1763-23-1	95.3	D2270-FS(0)	1.000	2/11/2023	1.02	2.39	4.79
HFPO-DA	13252-13-6	2.39 U	D2270-FS(0)	1.000	2/11/2023	0.829	2.39	4.79
Adona	919005-14-4	2.39 U	D2270-FS(0)	1.000	2/11/2023	0.832	2.39	4.79
9Cl-PF3ONS	756426-58-1	2.39 U	D2270-FS(0)	1.000	2/11/2023	0.987	2.39	4.79
11Cl-PF3OUdS	763051-92-9	2.39 U	D2270-FS(0)	1.000	2/11/2023	0.863	2.39	4.79

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-IDW16-AQ-012523
Battelle ID	D2270-FS
Sample Type	SA
Collection Date	01/25/2023
Extraction Date	02/08/2023
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS

Surrogate Recoveries (%)	Recovery		Extract ID	Analysis Date
13C5-PFHxA	94		D2270-FS(0)	2/11/2023
13C4-PFHpA	86		D2270-FS(0)	2/11/2023
13C8-PFOA	76		D2270-FS(0)	2/11/2023
13C9-PFNA	82		D2270-FS(0)	2/11/2023
13C6-PFDA	74		D2270-FS(0)	2/11/2023
13C7-PFUnA	56		D2270-FS(0)	2/11/2023
13C2-PFDoA	26	N	D2270-FS(0)	2/11/2023
13C2-PFTeDA	7	N	D2270-FS(0)	2/11/2023
d3-MeFOSAA	64		D2270-FS(0)	2/11/2023
d5-EtFOSAA	42	N	D2270-FS(0)	2/11/2023
13C3-PFBS	84		D2270-FS(0)	2/11/2023
13C3-PFHxS	62		D2270-FS(0)	2/11/2023
13C8-PFOS	74		D2270-FS(0)	2/11/2023
13C3-HFPO-DA	89		D2270-FS(0)	2/11/2023

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-IDW17-AQ-012523
Battelle ID	D2271-FS
Sample Type	SA
Collection Date	01/25/2023
Extraction Date	02/08/2023
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	NA
Matrix	WATER
Sample Size	0.265
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	13.0	D2271-FS(0)	1.000	2/11/2023	0.861	2.36	4.72
PFHpA	375-85-9	6.29	D2271-FS(0)	1.000	2/11/2023	0.888	2.36	4.72
PFOA	335-67-1	13.4	D2271-FS(0)	1.000	2/11/2023	0.953	2.36	4.72
PFNA	375-95-1	2.36 U	D2271-FS(0)	1.000	2/11/2023	0.786	2.36	4.72
PFDA	335-76-2	2.36 U	D2271-FS(0)	1.000	2/11/2023	0.740	2.36	4.72
PFUnA	2058-94-8	2.36 U	D2271-FS(0)	1.000	2/11/2023	0.709	2.36	4.72
PFDoA	307-55-1	2.36 U	D2271-FS(0)	1.000	2/11/2023	0.717	2.36	4.72
PFTrDA	72629-94-8	2.36 U	D2271-FS(0)	1.000	2/11/2023	0.700	2.36	4.72
PFTeDA	376-06-7	2.36 U	D2271-FS(0)	1.000	2/11/2023	0.746	2.36	4.72
NMeFOSAA	2355-31-9	2.36 U	D2271-FS(0)	1.000	2/11/2023	0.972	2.36	4.72
NEtFOSAA	2991-50-6	2.36 U	D2271-FS(0)	1.000	2/11/2023	0.934	2.36	4.72
PFBS	375-73-5	8.01	D2271-FS(0)	1.000	2/11/2023	0.817	2.36	4.72
PFHxS	355-46-4	89.4	D2271-FS(0)	1.000	2/11/2023	0.941	2.36	4.72
PFOS	1763-23-1	167	D2271-FS(0)	1.000	2/11/2023	1.01	2.36	4.72
HFPO-DA	13252-13-6	2.36 U	D2271-FS(0)	1.000	2/11/2023	0.816	2.36	4.72
Adona	919005-14-4	2.36 U	D2271-FS(0)	1.000	2/11/2023	0.820	2.36	4.72
9Cl-PF3ONS	756426-58-1	2.36 U	D2271-FS(0)	1.000	2/11/2023	0.972	2.36	4.72
11Cl-PF3OUdS	763051-92-9	2.36 U	D2271-FS(0)	1.000	2/11/2023	0.850	2.36	4.72

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It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-IDW17-AQ-012523
Battelle ID	D2271-FS
Sample Type	SA
Collection Date	01/25/2023
Extraction Date	02/08/2023
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS

Surrogate Recoveries (%)	Recovery	Extract ID	Analysis Date
13C5-PFHxA	116	D2271-FS(0)	2/11/2023
13C4-PFHpA	107	D2271-FS(0)	2/11/2023
13C8-PFOA	111	D2271-FS(0)	2/11/2023
13C9-PFNA	113	D2271-FS(0)	2/11/2023
13C6-PFDA	106	D2271-FS(0)	2/11/2023
13C7-PFUnA	84	D2271-FS(0)	2/11/2023
13C2-PFDoA	72	D2271-FS(0)	2/11/2023
13C2-PFTeDA	51	D2271-FS(0)	2/11/2023
d3-MeFOSAA	85	D2271-FS(0)	2/11/2023
d5-EtFOSAA	74	D2271-FS(0)	2/11/2023
13C3-PFBS	100	D2271-FS(0)	2/11/2023
13C3-PFHxS	93	D2271-FS(0)	2/11/2023
13C8-PFOS	102	D2271-FS(0)	2/11/2023
13C3-HFPO-DA	116	D2271-FS(0)	2/11/2023

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-IDW18-AQ-012523
Battelle ID	D2272-FS
Sample Type	SA
Collection Date	01/25/2023
Extraction Date	02/08/2023
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	NA
Matrix	WATER
Sample Size	0.260
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	2.32 J	D2272-FS(0)	1.000	2/11/2023	0.878	2.40	4.81
PFHpA	375-85-9	2.41 J	D2272-FS(0)	1.000	2/11/2023	0.905	2.40	4.81
PFOA	335-67-1	8.64	D2272-FS(0)	1.000	2/11/2023	0.971	2.40	4.81
PFNA	375-95-1	2.40 U	D2272-FS(0)	1.000	2/11/2023	0.801	2.40	4.81
PFDA	335-76-2	2.40 U	D2272-FS(0)	1.000	2/11/2023	0.754	2.40	4.81
PFUnA	2058-94-8	2.40 U	D2272-FS(0)	1.000	2/11/2023	0.723	2.40	4.81
PFDoA	307-55-1	2.40 U	D2272-FS(0)	1.000	2/11/2023	0.731	2.40	4.81
PFTrDA	72629-94-8	2.40 U	D2272-FS(0)	1.000	2/11/2023	0.713	2.40	4.81
PFTeDA	376-06-7	2.40 U	D2272-FS(0)	1.000	2/11/2023	0.761	2.40	4.81
NMeFOSAA	2355-31-9	2.40 U	D2272-FS(0)	1.000	2/11/2023	0.990	2.40	4.81
NEtFOSAA	2991-50-6	2.40 U	D2272-FS(0)	1.000	2/11/2023	0.952	2.40	4.81
PFBS	375-73-5	0.958 J	D2272-FS(0)	1.000	2/11/2023	0.833	2.40	4.81
PFHxS	355-46-4	3.50 J	D2272-FS(0)	1.000	2/11/2023	0.959	2.40	4.81
PFOS	1763-23-1	12.1	D2272-FS(0)	1.000	2/11/2023	1.03	2.40	4.81
HFPO-DA	13252-13-6	2.40 U	D2272-FS(0)	1.000	2/11/2023	0.832	2.40	4.81
Adona	919005-14-4	2.40 U	D2272-FS(0)	1.000	2/11/2023	0.836	2.40	4.81
9Cl-PF3ONS	756426-58-1	2.40 U	D2272-FS(0)	1.000	2/11/2023	0.990	2.40	4.81
11Cl-PF3OUdS	763051-92-9	2.40 U	D2272-FS(0)	1.000	2/11/2023	0.866	2.40	4.81

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-IDW18-AQ-012523
Battelle ID	D2272-FS
Sample Type	SA
Collection Date	01/25/2023
Extraction Date	02/08/2023
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS

Surrogate Recoveries (%)	Recovery	Extract ID	Analysis Date
13C5-PFHxA	111	D2272-FS(0)	2/11/2023
13C4-PFHpA	98	D2272-FS(0)	2/11/2023
13C8-PFOA	91	D2272-FS(0)	2/11/2023
13C9-PFNA	97	D2272-FS(0)	2/11/2023
13C6-PFDA	90	D2272-FS(0)	2/11/2023
13C7-PFUnA	75	D2272-FS(0)	2/11/2023
13C2-PFDoA	66	D2272-FS(0)	2/11/2023
13C2-PFTeDA	62	D2272-FS(0)	2/11/2023
d3-MeFOSAA	90	D2272-FS(0)	2/11/2023
d5-EtFOSAA	68	D2272-FS(0)	2/11/2023
13C3-PFBS	92	D2272-FS(0)	2/11/2023
13C3-PFHxS	77	D2272-FS(0)	2/11/2023
13C8-PFOS	85	D2272-FS(0)	2/11/2023
13C3-HFPO-DA	111	D2272-FS(0)	2/11/2023

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-IDW19-AQ-012523
Battelle ID	D2273-FS
Sample Type	SA
Collection Date	01/25/2023
Extraction Date	02/08/2023
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	NA
Matrix	WATER
Sample Size	0.257
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	9.50	D2273-FS(0)	1.000	2/11/2023	0.888	2.43	4.86
PFHpA	375-85-9	4.81 J	D2273-FS(0)	1.000	2/11/2023	0.915	2.43	4.86
PFOA	335-67-1	31.9	D2273-FS(0)	1.000	2/11/2023	0.982	2.43	4.86
PFNA	375-95-1	2.43 U	D2273-FS(0)	1.000	2/11/2023	0.810	2.43	4.86
PFDA	335-76-2	2.43 U	D2273-FS(0)	1.000	2/11/2023	0.763	2.43	4.86
PFUnA	2058-94-8	2.43 U	D2273-FS(0)	1.000	2/11/2023	0.732	2.43	4.86
PFDoA	307-55-1	2.43 U	D2273-FS(0)	1.000	2/11/2023	0.739	2.43	4.86
PFTrDA	72629-94-8	2.43 U	D2273-FS(0)	1.000	2/11/2023	0.722	2.43	4.86
PFTeDA	376-06-7	2.43 U	D2273-FS(0)	1.000	2/11/2023	0.769	2.43	4.86
NMeFOSAA	2355-31-9	2.43 U	D2273-FS(0)	1.000	2/11/2023	1.00	2.43	4.86
NEtFOSAA	2991-50-6	2.43 U	D2273-FS(0)	1.000	2/11/2023	0.963	2.43	4.86
PFBS	375-73-5	2.77 J	D2273-FS(0)	1.000	2/11/2023	0.842	2.43	4.86
PFHxS	355-46-4	56.8	D2273-FS(0)	1.000	2/11/2023	0.970	2.43	4.86
PFOS	1763-23-1	51.4	D2273-FS(0)	1.000	2/11/2023	1.04	2.43	4.86
HFPO-DA	13252-13-6	2.43 U	D2273-FS(0)	1.000	2/11/2023	0.841	2.43	4.86
Adona	919005-14-4	2.43 U	D2273-FS(0)	1.000	2/11/2023	0.845	2.43	4.86
9Cl-PF3ONS	756426-58-1	2.43 U	D2273-FS(0)	1.000	2/11/2023	1.00	2.43	4.86
11Cl-PF3OUdS	763051-92-9	2.43 U	D2273-FS(0)	1.000	2/11/2023	0.876	2.43	4.86

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-IDW19-AQ-012523
Battelle ID	D2273-FS
Sample Type	SA
Collection Date	01/25/2023
Extraction Date	02/08/2023
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS

Surrogate Recoveries (%)	Recovery	Extract ID	Analysis Date
13C5-PFHxA	145	D2273-FS(0)	2/11/2023
13C4-PFHpA	139	D2273-FS(0)	2/11/2023
13C8-PFOA	119	D2273-FS(0)	2/11/2023
13C9-PFNA	145	D2273-FS(0)	2/11/2023
13C6-PFDA	124	D2273-FS(0)	2/11/2023
13C7-PFUnA	114	D2273-FS(0)	2/11/2023
13C2-PFDoA	95	D2273-FS(0)	2/11/2023
13C2-PFTeDA	76	D2273-FS(0)	2/11/2023
d3-MeFOSAA	120	D2273-FS(0)	2/11/2023
d5-EtFOSAA	110	D2273-FS(0)	2/11/2023
13C3-PFBS	113	D2273-FS(0)	2/11/2023
13C3-PFHxS	90	D2273-FS(0)	2/11/2023
13C8-PFOS	125	D2273-FS(0)	2/11/2023
13C3-HFPO-DA	141	D2273-FS(0)	2/11/2023

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-IDW20-AQ-012523
Battelle ID	D2274-FS
Sample Type	SA
Collection Date	01/25/2023
Extraction Date	02/08/2023
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	NA
Matrix	WATER
Sample Size	0.297
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.845 J	D2274-FS(0)	1.000	2/11/2023	0.769	2.10	4.21
PFHpA	375-85-9	2.10 U	D2274-FS(0)	1.000	2/11/2023	0.792	2.10	4.21
PFOA	335-67-1	2.10 U	D2274-FS(0)	1.000	2/11/2023	0.850	2.10	4.21
PFNA	375-95-1	2.10 U	D2274-FS(0)	1.000	2/11/2023	0.701	2.10	4.21
PFDA	335-76-2	2.10 U	D2274-FS(0)	1.000	2/11/2023	0.660	2.10	4.21
PFUnA	2058-94-8	2.10 U	D2274-FS(0)	1.000	2/11/2023	0.633	2.10	4.21
PFDoA	307-55-1	2.10 U	D2274-FS(0)	1.000	2/11/2023	0.640	2.10	4.21
PFTrDA	72629-94-8	2.10 U	D2274-FS(0)	1.000	2/11/2023	0.625	2.10	4.21
PFTeDA	376-06-7	2.10 U	D2274-FS(0)	1.000	2/11/2023	0.666	2.10	4.21
NMeFOSAA	2355-31-9	2.10 U	D2274-FS(0)	1.000	2/11/2023	0.867	2.10	4.21
NEtFOSAA	2991-50-6	2.10 U	D2274-FS(0)	1.000	2/11/2023	0.833	2.10	4.21
PFBS	375-73-5	2.10 U	D2274-FS(0)	1.000	2/11/2023	0.729	2.10	4.21
PFHxS	355-46-4	2.10 U	D2274-FS(0)	1.000	2/11/2023	0.839	2.10	4.21
PFOS	1763-23-1	2.10 U	D2274-FS(0)	1.000	2/11/2023	0.901	2.10	4.21
HFPO-DA	13252-13-6	2.10 U	D2274-FS(0)	1.000	2/11/2023	0.728	2.10	4.21
Adona	919005-14-4	2.10 U	D2274-FS(0)	1.000	2/11/2023	0.731	2.10	4.21
9Cl-PF3ONS	756426-58-1	2.10 U	D2274-FS(0)	1.000	2/11/2023	0.867	2.10	4.21
11Cl-PF3OUdS	763051-92-9	2.10 U	D2274-FS(0)	1.000	2/11/2023	0.758	2.10	4.21

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-IDW20-AQ-012523
Battelle ID	D2274-FS
Sample Type	SA
Collection Date	01/25/2023
Extraction Date	02/08/2023
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS

Surrogate Recoveries (%)	Recovery	Extract ID	Analysis Date
13C5-PFHxA	124	D2274-FS(0)	2/11/2023
13C4-PFHpA	123	D2274-FS(0)	2/11/2023
13C8-PFOA	119	D2274-FS(0)	2/11/2023
13C9-PFNA	126	D2274-FS(0)	2/11/2023
13C6-PFDA	120	D2274-FS(0)	2/11/2023
13C7-PFUnA	113	D2274-FS(0)	2/11/2023
13C2-PFDoA	103	D2274-FS(0)	2/11/2023
13C2-PFTeDA	90	D2274-FS(0)	2/11/2023
d3-MeFOSAA	122	D2274-FS(0)	2/11/2023
d5-EtFOSAA	108	D2274-FS(0)	2/11/2023
13C3-PFBS	116	D2274-FS(0)	2/11/2023
13C3-PFHxS	104	D2274-FS(0)	2/11/2023
13C8-PFOS	120	D2274-FS(0)	2/11/2023
13C3-HFPO-DA	124	D2274-FS(0)	2/11/2023

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	LV69 IB
Battelle ID	LV69 IB_02/08/2023
Sample Type	IB
Collection Date	NA
Extraction Date	NA
Analysis Date	02/08/2023
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	NA
Matrix	Water
Sample Size	0.250
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	DL	LOD	LOQ
PFHxA	307-24-4	2.50 U	0.913	2.50	5.00
PFHpA	375-85-9	2.50 U	0.941	2.50	5.00
PFOA	335-67-1	2.50 U	1.01	2.50	5.00
PFNA	375-95-1	2.50 U	0.833	2.50	5.00
PFDA	335-76-2	2.50 U	0.784	2.50	5.00
PFUnA	2058-94-8	2.50 U	0.752	2.50	5.00
PFDoA	307-55-1	2.50 U	0.760	2.50	5.00
PFTrDA	72629-94-8	2.50 U	0.742	2.50	5.00
PFTeDA	376-06-7	2.50 U	0.791	2.50	5.00
NMeFOSAA	2355-31-9	2.50 U	1.03	2.50	5.00
NEtFOSAA	2991-50-6	2.50 U	0.990	2.50	5.00
PFBS	375-73-5	2.50 U	0.866	2.50	5.00
PFHxS	355-46-4	2.50 U	0.997	2.50	5.00
PFOS	1763-23-1	2.50 U	1.07	2.50	5.00
HFPO-DA	13252-13-6	2.50 U	0.865	2.50	5.00
Adona	919005-14-4	2.50 U	0.869	2.50	5.00
9Cl-PF3ONS	756426-58-1	2.50 U	1.03	2.50	5.00
11Cl-PF3OUdS	763051-92-9	2.50 U	0.901	2.50	5.00

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	LV69 IB
Battelle ID	LV69 IB_02/08/2023
Sample Type	IB
Collection Date	NA
Extraction Date	NA
Analysis Date	02/08/2023
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	NA
Matrix	Water
Sample Size	0.250
Size Unit-Basis	L

Surrogate Recoveries (%)

13C5-PFHxA	98
13C4-PFHpA	96
13C8-PFOA	105
13C9-PFNA	102
13C6-PFDA	103
13C7-PFUnA	103
13C2-PFDoA	104
13C2-PFTeDA	102
d3-MeFOSAA	98
d5-EtFOSAA	119
13C3-PFBS	103
13C3-PFHxS	106
13C8-PFOS	106
13C3-HFPO-DA	98

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	LV69 IB
Battelle ID	LV69 IB_02/10/2023
Sample Type	IB
Collection Date	NA
Extraction Date	NA
Analysis Date	02/10/2023
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	NA
Matrix	Water
Sample Size	0.250
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	DL	LOD	LOQ
PFHxA	307-24-4	2.50 U	0.913	2.50	5.00
PFHpA	375-85-9	2.50 U	0.941	2.50	5.00
PFOA	335-67-1	2.50 U	1.01	2.50	5.00
PFNA	375-95-1	2.50 U	0.833	2.50	5.00
PFDA	335-76-2	2.50 U	0.784	2.50	5.00
PFUnA	2058-94-8	2.50 U	0.752	2.50	5.00
PFDoA	307-55-1	2.50 U	0.760	2.50	5.00
PFTrDA	72629-94-8	2.50 U	0.742	2.50	5.00
PFTeDA	376-06-7	2.50 U	0.791	2.50	5.00
NMeFOSAA	2355-31-9	2.50 U	1.03	2.50	5.00
NEtFOSAA	2991-50-6	2.50 U	0.990	2.50	5.00
PFBS	375-73-5	2.50 U	0.866	2.50	5.00
PFHxS	355-46-4	2.50 U	0.997	2.50	5.00
PFOS	1763-23-1	2.50 U	1.07	2.50	5.00
HFPO-DA	13252-13-6	2.50 U	0.865	2.50	5.00
Adona	919005-14-4	2.50 U	0.869	2.50	5.00
9Cl-PF3ONS	756426-58-1	2.50 U	1.03	2.50	5.00
11Cl-PF3OUdS	763051-92-9	2.50 U	0.901	2.50	5.00

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	LV69 IB
Battelle ID	LV69 IB_02/10/2023
Sample Type	IB
Collection Date	NA
Extraction Date	NA
Analysis Date	02/10/2023
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	NA
Matrix	Water
Sample Size	0.250
Size Unit-Basis	L

Surrogate Recoveries (%)

13C5-PFHxA	107
13C4-PFHpA	109
13C8-PFOA	111
13C9-PFNA	111
13C6-PFDA	108
13C7-PFUnA	106
13C2-PFDoA	102
13C2-PFTeDA	117
d3-MeFOSAA	108
d5-EtFOSAA	109
13C3-PFBS	105
13C3-PFHxS	101
13C8-PFOS	105
13C3-HFPO-DA	109

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	Procedural Blank
Battelle ID	DL946PB-FS
Sample Type	PB
Collection Date	02/08/2023
Extraction Date	02/08/2023
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	NA
Matrix	WATER
Sample Size	0.249
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	2.51 U	DL946PB-FS(0)	1.000	2/11/2023	0.917	2.51	5.02
PFHpA	375-85-9	2.51 U	DL946PB-FS(0)	1.000	2/11/2023	0.945	2.51	5.02
PFOA	335-67-1	2.51 U	DL946PB-FS(0)	1.000	2/11/2023	1.01	2.51	5.02
PFNA	375-95-1	2.51 U	DL946PB-FS(0)	1.000	2/11/2023	0.836	2.51	5.02
PFDA	335-76-2	2.51 U	DL946PB-FS(0)	1.000	2/11/2023	0.787	2.51	5.02
PFUnA	2058-94-8	2.51 U	DL946PB-FS(0)	1.000	2/11/2023	0.755	2.51	5.02
PFDoA	307-55-1	2.51 U	DL946PB-FS(0)	1.000	2/11/2023	0.763	2.51	5.02
PFTrDA	72629-94-8	2.51 U	DL946PB-FS(0)	1.000	2/11/2023	0.745	2.51	5.02
PFTeDA	376-06-7	2.51 U	DL946PB-FS(0)	1.000	2/11/2023	0.794	2.51	5.02
NMeFOSAA	2355-31-9	2.51 U	DL946PB-FS(0)	1.000	2/11/2023	1.03	2.51	5.02
NEtFOSAA	2991-50-6	2.51 U	DL946PB-FS(0)	1.000	2/11/2023	0.994	2.51	5.02
PFBS	375-73-5	2.51 U	DL946PB-FS(0)	1.000	2/11/2023	0.869	2.51	5.02
PFHxS	355-46-4	2.51 U	DL946PB-FS(0)	1.000	2/11/2023	1.00	2.51	5.02
PFOS	1763-23-1	2.51 U	DL946PB-FS(0)	1.000	2/11/2023	1.07	2.51	5.02
HFPO-DA	13252-13-6	2.51 U	DL946PB-FS(0)	1.000	2/11/2023	0.868	2.51	5.02
Adona	919005-14-4	2.51 U	DL946PB-FS(0)	1.000	2/11/2023	0.872	2.51	5.02
9Cl-PF3ONS	756426-58-1	2.51 U	DL946PB-FS(0)	1.000	2/11/2023	1.03	2.51	5.02
11Cl-PF3OUdS	763051-92-9	2.51 U	DL946PB-FS(0)	1.000	2/11/2023	0.905	2.51	5.02

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	Procedural Blank
Battelle ID	DL946PB-FS
Sample Type	PB
Collection Date	02/08/2023
Extraction Date	02/08/2023
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS

Surrogate Recoveries (%)	**Recovery**	**Extract ID**	**Analysis Date**
13C5-PFHxA	106	DL946PB-FS(0)	2/11/2023
13C4-PFHpA	113	DL946PB-FS(0)	2/11/2023
13C8-PFOA	112	DL946PB-FS(0)	2/11/2023
13C9-PFNA	103	DL946PB-FS(0)	2/11/2023
13C6-PFDA	110	DL946PB-FS(0)	2/11/2023
13C7-PFUnA	110	DL946PB-FS(0)	2/11/2023
13C2-PFDoA	106	DL946PB-FS(0)	2/11/2023
13C2-PFTeDA	103	DL946PB-FS(0)	2/11/2023
d3-MeFOSAA	109	DL946PB-FS(0)	2/11/2023
d5-EtFOSAA	126	DL946PB-FS(0)	2/11/2023
13C3-PFBS	111	DL946PB-FS(0)	2/11/2023
13C3-PFHxS	117	DL946PB-FS(0)	2/11/2023
13C8-PFOS	113	DL946PB-FS(0)	2/11/2023
13C3-HFPO-DA	107	DL946PB-FS(0)	2/11/2023

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	Laboratory Control Sample
Battelle ID	DL947LCS-FS
Sample Type	LCS
Collection Date	02/08/2023
Extraction Date	02/08/2023
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	NA
Matrix	WATER
Sample Size	0.248
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	Target	Recovery	Qual	Control Limits Lower	Control Limits Upper
PFHxA	307-24-4	165	DL947LCS-FS(0)	1.000	2/11/2023	161	102		72	129
PFHpA	375-85-9	159	DL947LCS-FS(0)	1.000	2/11/2023	161	99		72	130
PFOA	335-67-1	178	DL947LCS-FS(0)	1.000	2/11/2023	161	111		71	133
PFNA	375-95-1	183	DL947LCS-FS(0)	1.000	2/11/2023	161	114		69	130
PFDA	335-76-2	166	DL947LCS-FS(0)	1.000	2/11/2023	161	103		71	129
PFUnA	2058-94-8	196	DL947LCS-FS(0)	1.000	2/11/2023	161	122		69	133
PFDoA	307-55-1	169	DL947LCS-FS(0)	1.000	2/11/2023	161	105		72	134
PFTrDA	72629-94-8	174	DL947LCS-FS(0)	1.000	2/11/2023	161	108		65	144
PFTeDA	376-06-7	156	DL947LCS-FS(0)	1.000	2/11/2023	161	97		71	132
NMeFOSAA	2355-31-9	165	DL947LCS-FS(0)	1.000	2/11/2023	161	102		65	136
NEtFOSAA	2991-50-6	153	DL947LCS-FS(0)	1.000	2/11/2023	161	95		61	135
PFBS	375-73-5	155	DL947LCS-FS(0)	1.000	2/11/2023	161	96		72	130
PFHxS	355-46-4	153	DL947LCS-FS(0)	1.000	2/11/2023	161	95		68	131
PFOS	1763-23-1	155	DL947LCS-FS(0)	1.000	2/11/2023	161	96		65	140
HFPO-DA	13252-13-6	148	DL947LCS-FS(0)	1.000	2/11/2023	161	92		60	126
Adona	919005-14-4	174	DL947LCS-FS(0)	1.000	2/11/2023	161	108		61	130
9Cl-PF3ONS	756426-58-1	153	DL947LCS-FS(0)	1.000	2/11/2023	161	95		60	126
11Cl-PF3OUdS	763051-92-9	164	DL947LCS-FS(0)	1.000	2/11/2023	161	102		56	125

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	Laboratory Control Sample
Battelle ID	DL947LCS-FS
Sample Type	LCS
Collection Date	02/08/2023
Extraction Date	02/08/2023
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS

Surrogate Recoveries (%)	Recovery	Extract ID	Analysis Date
13C5-PFHxA	120	DL947LCS-FS(0)	2/11/2023
13C4-PFHpA	119	DL947LCS-FS(0)	2/11/2023
13C8-PFOA	116	DL947LCS-FS(0)	2/11/2023
13C9-PFNA	113	DL947LCS-FS(0)	2/11/2023
13C6-PFDA	127	DL947LCS-FS(0)	2/11/2023
13C7-PFUnA	127	DL947LCS-FS(0)	2/11/2023
13C2-PFDoA	127	DL947LCS-FS(0)	2/11/2023
13C2-PFTeDA	121	DL947LCS-FS(0)	2/11/2023
d3-MeFOSAA	122	DL947LCS-FS(0)	2/11/2023
d5-EtFOSAA	116	DL947LCS-FS(0)	2/11/2023
13C3-PFBS	119	DL947LCS-FS(0)	2/11/2023
13C3-PFHxS	119	DL947LCS-FS(0)	2/11/2023
13C8-PFOS	124	DL947LCS-FS(0)	2/11/2023
13C3-HFPO-DA	119	DL947LCS-FS(0)	2/11/2023

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Glossary of Data Qualifiers

Flag:	Application:
B	Analyte found in the sample at a concentration <10x the level found in the procedural blank
D	Dilution Run. Initial run outside the initial calibration range of the instrument
E	Estimate, result is greater than the highest concentration level in the calibration
J	Analyte detected below the Limit of Quantitation (LOQ)
MI	Significant Matrix Interference - value could not be determined.
N	Quality Control (QC) value is outside the accuracy or precision Data Quality Objective (DQO)
NA	Not Applicable
T	Holding Time (HT) exceeded
U	Analyte not detected or detected below the Detection Limit (DL) value, Limit of Detection (LOD) reported
Q	Ion ratio outside of criteria (50% difference from calibration expected ratio)

CTO-4117: Northwest PFAS Investigation
Project No G25161.X1.XX.0026.000001
PFAS by DoD QSM 5.3 Table B-15

SOIL

Batch 22-1943

Package DP-22-2005

Submitted to:
CH2M
5701 Cleveland Street
Virginia Beach, VA 23462 USA

Submitted by:
Battelle Norwell Operations
141 Longwater Drive Suite 202
Norwell, MA 02061

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CTO-4117: Northwest PFAS Investigation
Project No G25161.X1.XX.0026.000001
PFAS by DoD QSM 5.3 Table B-15

SOIL

Batch 22-1943

Package DP-22-2005

Submitted to:
CH2M
5701 Cleveland Street
Virginia Beach, VA 23462 USA

NELAP Accreditation Number: E87856 (Florida Department of Health)
DoD-ELAP Accreditation Number: 91667

Submitted by:
Battelle Norwell Operations
141 Longwater Drive Suite 202
Norwell, MA 02061

Analyst Approval: Kelsey Hamden 2022.11.15 11:15:48 -05'00'

QC Chemist Approval: Digitally signed by Emily Reardon Date: 2022.11.18 11:38:46 -05'00'

Project Manager Approval: Robert Lizotte, Jr. 2022.11.18 11:58:52 -05'00'

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CTO-4117: Northwest PFAS Investigation
Project No G25161.X1.XX.0026.000001
PFAS by DoD QSM 5.3 Table B-15

SOIL

Batch 22-1943

Package DP-22-2005

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Master Signature Page

Name (Printed)	Signature	Initials	Date
Jonathan Thorn		JRT	1/9/2020
Robert Lizotte, Jr.		BL	1.9.2020
Elyn M Fitch		EMF	1/9/2020
Carla Devine		CRD	1/9/2020
Denise Schumitz		DS	1/9/2020
Lauren Griffith		LMG	1.9.2020
Carrie P McCarthy		CPM	1/9/2020
Rich Restuccia		RR	1/9/2020
Sam Guimaraes		SAG	1/9/2020
Jordan Tower		JLT	1/9/2020
Christie Usher		CU	1/9/2020
Kevin McInerney		KM	1/14/2020
Matt Schumitz		MDS	1/14/2020
Weidong Li		W.L	1/14/2020
Kayla Lamarre		KAL	1/14/2020
MUNAZ MUNTASIR		MM	01/14/2020
Kristen Nichols		KN	01/14/2020
Kelsey Harnden		KH	01/30/2020
Kevin Bailey		KB	1/30/2020
Stephanie Schultz		SAS	1/30/2020

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Name (Printed)	Signature	Initials	Date
Clinicea Brown		CB	01/30/20
Ryan Kelly		RK	01/30/20
KAREN HYPPOLITE		K.H.	01/31/20
Gail DeRuzzo		GD	01/31/2020
Tracy Stenner			1/31/2020
Ashley Wellington		AW	1131/2020
Daniel Cooney		DAC	1/31/2020
Peter Demers		PD	1/31/2020
Andy Delmar		AD	3/19/2021
Emily Reardon		ER	3/19/2021
Brenton Murphy		Bm	3/19/2021
Haley Hart		H H	3/19/21
Allison Wamaess		AW	3/19/21
Taylor Noonan		TN	3/19/21
FRANCO PALA		FP	3/19/21
Amina Chamanlal		AC	11/03/21
J Michelle Wentzell		MW	11-3-21
Zachary Dreiker		ZD	11/3/21
Drew Croke		DC	11/3/21
Zachary Willenberg		ZW	11/3/21

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Name (Printed)	Signature	Initials	Date
Hayley Beal	Hayley Beal	HB	5/9/2022
Nathaniel Kinsman	Nathaniel Kinsman	NK	5/9/2022
Debra Huntress	Debra Huntress	DHU	5/9/22
Vincent Urso	Vincent Urso	VU	5/9/22

Sample Summary

Client: CH2M (Jacobs)
SDG: 22-1943
Project/Site: NBK Keyport
CTO: 4117

Lab Sample ID	Client Sample ID	Matrix	Collection Date	Receipt Date
DK852PB-FS	220520-01: Ottawa Sand	SOLID	11/8/2022	11/8/2022
DK853LCS-FS	220520-01: Ottawa Sand	SOLID	11/8/2022	11/8/2022
E9337-FS	NBKK-IDW01-SO-102722	SOIL	10/27/2022	10/29/2022
E9338-FS	NBKK-IDW02-SO-102722	SOIL	10/27/2022	10/29/2022
E9339-FS	NBKK-IDW03-SO-102722	SOIL	10/27/2022	10/29/2022

Work Plan

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WORK/QUALITY ASSURANCE PROJECT PLAN

1.0 GENERAL PROJECT INFORMATION

Project Title:	CTO-4117: NBK Keyport PFAS in Solids
Project Number:	G25161.X1.XX.0026.000001
Client:	CH2M 5701 Cleveland Street Suite 200 Virginia Beach, VA 23462 USA
Client Contact Information:	Juan Acaron Project Chemist (352) 331-8121(V) NA juan.acaron@jacobs.com
Effective Date of QAPP:	9/12/2022
Version Number:	G25161.X1.XX.0026.000001(S)-12
Project Manager:	Thorn, Jonathan
Laboratory Task Manager:	Thorn, Jonathan
Deliverable Due Date:	10/14/2022

2.0 SCOPE OF WORK

Overview:	PFAS in solid samples (18 analytes)
Matrix:	Soil/Sediment

2.1 TECHNICAL APPROACH

2.1.1 Sample Receipt, Storage, and Handling

The list of samples for this project plan are presented in Attachment 1.

Storage Directions:	Store refrigerated.
Sub_Sampling:	None
Procedures:	NA
Contact:	NA
Comment:	NA
Archiving:	Dispose of excess samples after six months.
Disposal:	Dispose of excess samples in the appropriate waste stream.

2.1.2 Sample Preparation

NA

Samples Expected:	Samples Per Batch:	Batches Expected:
20	20	1

Batch quality control samples are defined in Table 1.

Target samples are presented in Attachment 1.

Table 1: Quality Control Samples

Type:	*Description:*	*Count:*	*Rgt:*	*Reference:*	*Comment:*
PB	Laboratory control reagent blank.	1 per batch	--	220520-01: Ottawa Sand Lot:2KA0342	
LCS	Laboratory Control Sample	1 per batch	Yes	220520-01: Ottawa Sand Lot:2KA0342	
MS	Spiked field sample for determining method accuracy in the presence of matrix.	1 per batch	--	NA	
MSD	Spiked field sample for determining method accuracy and precision in the presence of matrix.	1 per batch	--	NA	

2.1.3 Extraction/Preparation

2.1.3.1 Extraction

SOP No.-Rev: **5-370-13**

SOP Title: *Extraction of Poly and Perfluoroalkyl Substances from Environmental Matrices*

Sample Size: 5.00 g

SIS and LCS/MS Compounds: Defined in Table 2.

Deviations: None.

Comments: None.

Table 2: SIS and LCS/MS Spiking Level

Standard Type	Standard Contents		Spike Amount (ng)	Volume (uL)	Comment
PFAS DoD Surrogate (18 Targets)	LS23	SIS	~ 25.0 ng	50 uL	NA
PFAS DoD Second Source LCS/MS (18 Analytes)	LR93	LCS/MS	~ 50 ng	125 uL	Vary spike between 100 and 150 µL

2.1.3.2 Cleanup

None.

RIS spiking levels are presented in Table 3.

Extract PIV (uL): 5000

Table 3: RIS Spiking Level

Standard Type	Standard Contents	Spike Amount (ng)	Volume (uL)	Comment
PFAS DoD Internal Standards	LS03 RIS	~ 25.0 ng	50 uL	NA

2.1.4 Instrumental Analysis

The list of analytes along with data quality criteria are presented in Attachment 2.

1) SOP_No-Rev: **5-369-09**

SOP_Title: *Analysis of Perfluoroalkyl Substances in Environmental Samples by Liquid Chromatography and Tandem Mass Spectrometry (LC-MS/MS)*

Deviations: None

Comments: None

2.2. DELIVERABLES

Deliverables Due:	10/14/2022
LIMS Reports:	*No*
Histograms:	*No*
Excel Tables:	*No*
EICs:	*No*
Chromatograms:	*No*
EDDs:	*No*
Comments:	• Individual data sets will be due 28 days after receipt of each sample set. • Select data sets have expedited TAT. • Full Level 4 data package (QSM 5.3 Table B-15 compliant) required. • CH2M EDD required. • WO 148003519

3.0 QUALITY

The Method Quality Objectives are defined in Attachment 3.

4.0 ORGANIZATION AND COMMUNICATION

4.1 ORGANIZATION

The project team is defined in Table 4. Supervisors may make substitutions with Project Manager concurrence.

Table 4: Project Team and Roles

Staff Member	Role	Comment
Jonathan R. Thorn	Project Manager	NA
Kelsey Harnden	Sample Preparation	NA
Denise M. Schumitz	LC-MS/MS Analysis	NA
Matt D. Schumitz	Sample Custody	NA
Carla R. Devine	Quality Control Officer	NA
Zachary J. Willenberg	Quality Assurance Officer	NA

4.2 COMMUNICATION

A kick-off meeting will be held to discuss project scope and goals.

5.0 SCHEDULE

The project schedule is presented in Table 5.

Table 5. Schedule of Laboratory Activities

Activity:	Start Date:	End Date:	TAT (days):	Comment:
Sample Receipt	09/12/2022	09/12/2022	0	NA
Sample Preparation	09/12/2022	09/30/2022	18	NA
Instrument Analysis	09/30/2022	10/13/2022	13	NA
Quality Control Review	10/13/2022	10/14/2022	1	NA
Quality Assurance Review	10/14/2022	10/14/2022	0	NA

6.0 BUDGET

The labor budget for the analytical task is presented in Table 6.

Table 6. Labor Budget (Laboratory Analytical Task)

Labor Activity:	Hours/ Batch:	Batches:	Total Hours:	Comment:
Sample Receipt	2	1	2	Hours per 12 samples
Sample Preparation	5	1	5	Hours per 12 samples
Instrument Analysis	5	1	5	Hours per 12 samples
Quality Control Review	2	1	2	1.5 hours per 12 samples
Quality Assurance Review	1	1	1	Hours per 12 samples

7.0 STAFF DEVELOPMENT

None anticipated.

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WORK/QUALITY ASSURANCE PROJECT PLAN

Attachment 1: Target Samples

Shipment: **SHP-220912-02**

Status: Pending

Description: NBK Keyport PFAS SI

Range: E6452-E6463

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	E6452	NBKK-B76-SS01-0203	08/30/2022 11:05 am	SO	R0119 (NA)			
2	E6453	NBKK-B76-SS02-0203	08/30/2022 2:20 pm	SO	R0119 (NA)			
3	E6454	NBKK-B76-SS03-0203	08/30/2022 12:35 pm	SO	R0119 (NA)			
4	E6455	NBKK-B76-SB03-3334	09/01/2022 1:10 pm	SO	R0119 (NA)			
5	E6456	NBKK-OU2AS-SS01-0H01	09/07/2022 1:10 pm	SO	R0119 (NA)			
6	E6457	NBKK-B76-SB04-5859	09/06/2022 11:40 am	SO	R0119 (NA)			
7	E6458	NBKK-B76-SS05-0001	09/02/2022 11:05 am	SO	R0119 (NA)			
8	E6459	NBKK-OU2AS-SS03P-0102	09/07/2022 10:50 am	SO	R0119 (NA)			
9	E6460	NBKK-OU2AS-SS03-0102	09/07/2022 10:50 am	SO	R0119 (NA)			
10	E6461	NBKK-B76-SB02-4849	08/31/2022 3:10 pm	SO	R0119 (NA)			
11	E6462	NBKK-B76-SS04-0102	08/31/2022 10:00 am	SO	R0119 (NA)			
12	E6463	NBKK-B76-SB01-2526	08/30/2022 1:55 pm	SO	R0119 (NA)			

Shipment: **SHP-220916-02**

Status: Pending

Description: NBK Keyport

Range: E6619-E6620

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	E6619	NBKK-OU2A5-SB02-0102	09/07/2022 11:15 am	SO	R0119 (NA)			
2	E6620	NBKK-OU2A5-SB03-3334	09/08/2022 11:10 am	SO	R0119 (NA)			

Shipment: **SHP-221004-07**

Status: Pending

Description: NBK Keyport

Range: E7804-E7815

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	E7804	NBKK-CF1-SS05-0001	09/30/2022 10:08 am	SOIL	R0119 (NA)			
2	E7806	NBKK-CF1-SS04-0001	09/30/2022 10:55 am	SOIL	R0119 (NA)			
3	E7807	NBKK-B1006-SS05-0001	09/30/2022 12:03 pm	SOIL	R0119 (NA)			
4	E7809	NBKK-B1006-SS06-0001	09/30/2022 12:37 pm	SOIL	R0119 (NA)			
5	E7810	NBKK-B1006-SS07-0001	09/30/2022 1:03 pm	SOIL	R0119 (NA)			
6	E7811	NBKK-B1006-SS01-0102	10/01/2022 9:35 am	SOIL	R0119 (NA)			

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WORK/QUALITY ASSURANCE PROJECT PLAN

Shipment: **SHP-221004-07**

Status: Pending

Description: NBK Keyport

Range: E7804-E7815

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
7	E7812	NBKK-B1006-SS02-0102	10/01/2022 10:55 am	SOIL	R0119 (NA)			
8	E7813	NBKK-B1006-SS03-0001	10/01/2022 11:30 am	SOIL	R0119 (NA)			
9	E7814	NBKK-B76-SB05-0304	10/01/2022 2:35 pm	SOIL	R0119 (NA)			
10	E7815	NBKK-LFEX-SS03-0102	10/03/2022 10:00 am	SOIL	R0119 (NA)			

Shipment: **SHP-221011-05**

Status: Pending

Description: PNW PFAS SI NBK KEYPORT

Range: E8151-E8156

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	E8151	NBKK-LFEX-SB03-0708	10/03/2022 2:50 pm	SOIL	R0119 (NA)			
2	E8152	NBKK-LFEX-SB03-1718	10/03/2022 2:55 pm	SOIL	R0119 (NA)			
3	E8153	NBKK-LFEX-SS02-0001	10/03/2022 2:05 pm	SOIL	R0119 (NA)			
4	E8154	NBKK-LFEX-SB02-2122	10/04/2022 2:25 pm	SOIL	R0119 (NA)			
5	E8155	NBKK-LFEX-SS01-0001	10/04/2022 2:35 pm	SOIL	R0119 (NA)			
6	E8156	NBKK-LFEX-SS04-0001	10/04/2022 5:05 pm	SOIL	R0119 (NA)			

Shipment: **SHP-221013-06**

Status: Pending

Description: PNW PFAS SI NBK-KEYPART

Range: E8359-E8363

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	E8359	NBKK-LFEX-SB01-2728	10/06/2022 4:20 pm	SOIL	R0119 (NA)			
2	E8360	NBKK-LFEX-SB04-2627	10/07/2022 3:20 pm	SOIL	R0119 (NA)			
3	E8361	NBKK-CF1-SS01-1H2H	10/07/2022 4:20 pm	SOIL	R0119 (NA)			
4	E8362	NBKK-CF1-SS03-0001	10/08/2022 9:15 am	SOIL	R0119 (NA)			
5	E8363	NBKK-CF1-SS02-0102	10/08/2022 11:25 am	SOIL	R0119 (NA)			

Shipment: **SHP-221019-07**

Status: Pending

Description: PNW PFAS SI NBK-Keyport

Range: E8546-E8547

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	E8546	NBKK-CF1-MW01-5152	10/13/2022 3:15 pm	SOIL	R0119 (NA)			

BATTELLE
It can be done

WORK/QUALITY ASSURANCE PROJECT PLAN

Shipment: **SHP-221019-07**

Status: Pending

Description: PNW PFAS SI NBK-Keyport

Range: E8546-E8547

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
2	E8547	NBKK-CF1-MW03-5152	10/15/2022 10:20 am	SOIL	R0119 (NA)			

Shipment: **SHP-221028-01**

Status: Pending

Description: PNW PFAS SI NBK-KEYPORT

Range: E9287-E9291

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	E9287	NBKK-S7-SS04-0102	10/25/2022 9:20 am	SOIL	R0119 (NA)			
2	E9288	NBKK-S7-SB04-0910	10/25/2022 3:15 pm	SOIL	R0119 (NA)			
3	E9289	NBKK-S7-SS05-0102	10/26/2022 11:45 am	SOIL	R0119 (NA)			
4	E9291	NBKK-S7-SB05-0910	10/26/2022 2:20 pm	SOIL	R0119 (NA)			

Shipment: **SHP-221031-02**

Status: Pending

Description: PNW PFAS SI NBK Keyport

Range: E9337-E9346

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	E9337	NBKK-IDW01-SO-102722	10/27/2022 1:00 pm	SOIL	R0119 (NA)			
2	E9338	NBKK-IDW02-SO-102722	10/27/2022 1:45 pm	SOIL	R0119 (NA)			
3	E9339	NBKK-IDW03-SO-102722	10/27/2022 2:15 pm	SOIL	R0119 (NA)			
4	E9341	NBKK-S7-SS02-0001	10/27/2022 11:25 am	SOIL	R0119 (NA)			
5	E9342	NBKK-S7-SS02-0001 MS	10/27/2022 11:25 am	SOIL	R0119 (NA)			
6	E9343	NBKK-S7-SS02-0001 MSD	10/27/2022 11:25 am	SOIL	R0119 (NA)			
7	E9345	NBKK-S7-SB02-1011	10/27/2022 3:15 pm	SOIL	R0119 (NA)			
8	E9346	NBKK-S7-SS01-0102	10/28/2022 10:00 am	SOIL	R0119 (NA)			

Shipment: **SHP-221103-06**

Status: Pending

Description: PNW PFAS SI NBK KEYORT

Range: E9604-E9612

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:

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It can be done

WORK/QUALITY ASSURANCE PROJECT PLAN

Shipment: **SHP-221103-06**

Status: Pending

Description: PNW PFAS SI NBK KEYORT

Range: E9604-E9612

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	E9604	NBKK-S7-SB01-0809	10/28/2022 1:30 pm	SO	R0119 (NA)			
2	E9605	NBKK-OU2A5-SB02-2930	10/29/2022 1:15 pm	SO	R0119 (NA)			
3	E9606	NBKK-OU2A5-SB02P-2930	10/29/2022 1:15 pm	SO	R0119 (NA)			
4	E9607	NBKK-OU2A5-SB01-3637	10/31/2022 2:00 pm	SO	R0119 (NA)			
5	E9608	NBKK-OU2A5-SB05-0203	11/01/2022 10:55 am	SO	R0119 (NA)			
6	E9609	NBKK-OU2A5-SB05-1011	11/01/2022 12:10 pm	SO	R0119 (NA)			
7	E9610	NBKK-OU2A5-SB04-0203	11/01/2022 12:45 pm	SO	R0119 (NA)			
8	E9611	NBKK-OU2A5-SB04-0506	11/01/2022 2:30 pm	SO	R0119 (NA)			
9	E9612	NBKK-CF1-SS02-0H01	11/01/2022 4:55 pm	SO	R0119 (NA)			

Shipment: **SHP-221110-02**

Status: Pending

Description: NBK Keyport

Range: E9763-E9777

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	E9763	NBKK-CF1-SB02-3839	11/02/2022 2:00 pm	SO	R0119 (NA)			
2	E9764	NBKK-B1006-SS04-0H01	11/03/2022 1:10 pm	SO	R0119 (NA)			
3	E9765	NBKK-B1006-SS04P-0H01	11/03/2022 1:10 pm	SO	R0119 (NA)			
4	E9766	NBKK-OU2A2-SS02-0H01	11/04/2022 10:10 am	SO	R0119 (NA)			
5	E9767	NBKK-OU2A2-SS03-0203	11/04/2022 1:30 pm	SO	R0119 (NA)			
6	E9768	NBKK-OU2A2-SS03-0203-MS	11/04/2022 1:30 pm	SO	R0119 (NA)			
7	E9769	NBKK-OU2A2-SS03-0203-MSD	11/04/2022 1:30 pm	SO	R0119 (NA)			
8	E9770	NBKK-OU2A2-SS01-0H01	11/05/2022 9:00 am	SO	R0119 (NA)			
9	E9771	NBKK-OU2A2-SS04-0203	11/07/2022 11:45 am	SO	R0119 (NA)			
10	E9773	NBKK-OU2A2-SS05-0102	11/08/2022 9:10 am	SO	R0119 (NA)			
11	E9775	NBKK-OU2A2-SS06-0H01	11/08/2022 10:40 am	SO	R0119 (NA)			
12	E9776	NBKK-OU2A2-SS06-0304	11/08/2022 10:55 am	SO	R0119 (NA)			

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It can be done

WORK/QUALITY ASSURANCE PROJECT PLAN

Shipment: **SHP-221110-02**

Status: Pending

Description: NBK Keyport

Range: E9763-E9777

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
13	E9777	NBKK-OU2A2-SB05-0607	11/08/2022 11:45 am	SO	R0119 (NA)			

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WORK/QUALITY ASSURANCE PROJECT PLAN

Attachment 2: Test Codes

Project Test Code Name:	Master_369D
SOP Reference:	5-369 - Analysis of Perfluoroalkyl Substances in Environmental Samples by Liquid Chromatography and Tandem Mass Spectrometry (LC-MS/MS)
Description:	PFAS by DoD QSM 5.3 Table B-15
Matrix:	S - Solid Samples, like soil or sediment, prepared and anlyzed under the same class of detection limits.
Detection Limit Study:	5-369
Instrument:	LC-MS/MS
MQO Criteria:	Universal_LC
Standard Report:	Standard Result Report

Method Specific Reporting

Result Units:	ng/g	***Unit Conversion:***	(none)
Weight Basis:	DRY	***Result Format:***	Fixed Digits
Standard Basis:	SIS	***# of Figures/Digits:***	2
Oil Weight Basis:	No	***Oil Weight Source:***	Oil Weight
U-Value Substition:	U-Flag=MD	***Histograms:***	No
ECD_Reporting:	No		

Holding Times (days)

Sample:	14
Frozen:	14
Extract:	28

Data Flags

DL_Flag:	U
RL_Flag:	J
PB_Flag:	B
DIL_Flag:	D
HT_Flag:	T

No:	Analyte:	Report Name:	Type	RIS	SIS	Hidden:	Graph:
1	Perfluoro-n-hexanoic acid	PFHxA	T		13C5-PFHxA	No	No
2	Perfluoro-n-heptanoic Acid	PFHpA	T		13C4-PFHpA	No	No
3	Perfluoro-n-octanoic Acid	PFOA	T		13C8-PFOA	No	No
4	Perfluorononanoic Acid	PFNA	T		13C9-PFNA	No	No
5	Perfluoro-n-decanoic Acid	PFDA	T		13C6-PFDA	No	No
6	Perfluoro-n-undecanoic acid	PFUnA	T		13C7-PFUnA	No	No
7	Perfluoro-n-dodecanoic acid	PFDoA	T		13C2-PFDoA	No	No
8	Perfluoro-n-tridecanoic acid	PFTrDA	T		13C2-PFTeDA	No	No
9	Perfluoro-n-tetradecanoic acid	PFTeDA	T		13C2-PFTeDA	No	No
10	N-methylperfluoro-1-octanesulfonamidoacetic acid	NMeFOSAA	T		d3-MeFOSAA	No	No
11	N-ethylperfluoro-octanesulfonamidoacetic acid	NEtFOSAA	T		d5-EtFOSAA	No	No
12	Perfluoro-1-butanesulfonate	PFBS	T		13C3-PFBS	No	No
13	Perfluoro-1-hexanesulfonate	PFHxS	T		13C3-PFHxS	No	No
14	Perfluoro-1-octanesulfonate	PFOS	T		13C8-PFOS	No	No
15	Hexafluoropropylene oxide dimer acid	HFPO-DA	T		13C3-HFPO-DA	No	No
16	Adona	Adona	T		13C8-PFOA	No	No
17	9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	9Cl-PF3ONS	T		13C8-PFOA	No	No

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WORK/QUALITY ASSURANCE PROJECT PLAN

Attachment 2: Test Codes

Project Test Code Name: Master_369D

No:	Analyte:	Report Name:	Type	RIS	SIS	Hidden:	Graph:
18	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	11Cl-PF3OUdS	T		13C8-PFOA	No	No
1	13C5-PFHxA	13C5-PFHxA	SIS	13C2-PFOA		No	No
2	13C4-PFHpA	13C4-PFHpA	SIS	13C2-PFOA		No	No
3	13C8-PFOA	13C8-PFOA	SIS	13C2-PFOA		No	No
4	13C9-PFNA	13C9-PFNA	SIS	13C2-PFOA		No	No
5	13C6-PFDA	13C6-PFDA	SIS	13C2-PFDA		No	No
6	13C7-PFUnA	13C7-PFUnA	SIS	13C2-PFDA		No	No
7	13C2-PFDoA	13C2-PFDoA	SIS	13C2-PFDA		No	No
8	13C2-PFTeDA	13C2-PFTeDA	SIS	13C2-PFDA		No	No
9	d3-MeFOSAA	d3-MeFOSAA	SIS	13C4-PFOS		No	No
10	d5-EtFOSAA	d5-EtFOSAA	SIS	13C4-PFOS		No	No
11	13C3-PFBS	13C3-PFBS	SIS	13C4-PFOS		No	No
12	13C3-PFHxS	13C3-PFHxS	SIS	13C4-PFOS		No	No
13	13C8-PFOS	13C8-PFOS	SIS	13C4-PFOS		No	No
14	13C3-HFPO-DA	13C3-HFPO-DA	SIS	13C2-PFOA		No	No

Total Analytes: 32

Subtract Peaks:

None

Sum Peaks:

None

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WORK/QUALITY ASSURANCE PROJECT PLAN

Attachment 2: Test Codes

Project Test Code Name: Master_369D

ICAL Acceptance Criteria:

Curve Fit:	Limit Mean(%):	Mean Qual:	Limit Ind.:	Ind. Qual:	Min Points:	Points Qual:	Comments:
Linear	NA	NA	0.99	N	5	N	y = Bx + C
Quadratic	NA	NA	0.99	N	6	N	y = Ax^2 + Bx + C

Continuing Calibration Verification Criteria:

CCV Name: 5-369

Frequency Hrs:		Mean PD(%):		Individual PD(%):		RIS/SIS RT Window (min):		Area Limit Low(%):	Area Limit High(%):		Comment:
12	(N)	30	(N)	30	(N)	0.04	(N)	-50	100	(N)	NA

Independent Calibration Verification:

ICC Name: 5-369

Mean PD Limit(%):		Ind. PD Limit(%):		RIS/SIS Window Limit (Secs):		Area Limit High(%):	Area Limit Low(%):		Comment:
30	(N)	30	(N)	0.04	(N)	-50	100	(N)	NA

Mass Discrimination Criteria:

None

Degredation Check Criteria:

None

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WORK/QUALITY ASSURANCE PROJECT PLAN

Attachment 3: Method Quality Objectives

MQO Application:	***Universal_LC***		
MQO:	**Acceptance Criteria:**	**Qual:**	**Corrective Action:**
Procedural Blank	Samples must be greater than five times the blank concentration (>5xPB).	B	Review with Project Manager; re-analyze or justify results in project records.
PB Measurement Quality Objective	Organic results in the Procedural Blank are less than 1/2 times the LOQ (<1/2xLOQ)	N	Review with Project Manager; re-analyze or justify results in project records.
Laboratory Control Sample	Recovery values 70-130%.	N	Review with project manager; re-analyze or justify reporting the results in project records.
Matrix Spike / Matrix Spike Duplicate Recovery	Organics 70-130%. Analyte concentration in MS/MSD must be greater than five times reported background concentration.	N	Review with Project Manager; re-analyze or justify reporting results in the project records.
	Organics Results in the Target is less than 5 times the Original	n	
Matrix Spike/Spike Duplicate Precision	Organics results less than 30% Relative Percent Difference (RPD). Analyte concentration in MS/MSD must be greater than five times reported background concentration.	N	Review with Project Manager; re-analyze or justify reporting results in the project records.
	Organics Results in the Target is less than 5 times the Original	n	
Standard Reference Material Accuracy	Organics Percent Difference less than 30% from a range of certified values on average. Analyte concentration must be greater than five times the Method Detection Limit (>5xMDL).	N	Review with Project Manager; re-analyze or justify reporting results in the project records.
	Organics Results in the Target is less than 5 times the MDL	n	
Analytical Duplicate Precision	Organics results less than 30% Relative Percent Difference (RPD). Analyte concentration must be > 5x MDL.	N	Review with Project Manager; re-analyze or justify reporting results in the project records.
	Organics Results in the Original is less than 5 times the MDL	n	

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WORK/QUALITY ASSURANCE PROJECT PLAN

Attachment 3: Method Quality Objectives

MQO Application:	*Universal_LC*		
MQO:	**Acceptance Criteria:**	**Qual:**	**Corrective Action:**
Analytical Triplicate Precision	Organics results less than 30% Relative Standard Deviation (RSD). Analyte concentration must be > 5x MDL. Organics Results in the Original is less than 5 times the MDL	N n	Review with Project Manager; re-analyze or justify reporting results in the project records.
Surrogate Compound Recovery	Recovery results between 50% and 150%.	N	Review with Project Manager; re-analyze or justify reporting results in the project records.
Control Oil	RPD < 30% for at least 90% of analytes	N	Results examined by project manager, task leader, or subcontractor lab manager. Reextraction, reanalysis, or justification documented.
Instrument Calibration	5-369-9: R-squared greater than or equal to 0.990		Results examined by project manager, task leader, or subcontractor lab manager. Reextraction, reanalysis, or justification documented.
Independent Calibration Check Solution	5-369-9: Individual PD less than or equal to 30%. Mean Percent Difference less than or equal to 30%.	N	Review with Project Manager; re-analyze or justify in project records.
Continuing Calibration Verification	5-369-9: Individual PD less than or equal to 30%. Mean Percent Difference less than or equal to 30%.	N	Review with Project Manager; re-analyze or justify in project records.

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ShpNo SHP-221031-02

Battelle Project No: 026.000001

Sample Receipt Form

Approved: ☐ Authorized ☐

Project Number: 704758CH **Client:** Jacobs

Received by: Schumitz, Matt **Date/Time Received:** Saturday, October 29, 2022 12:00 PM

No. of Shipping Containers: 1

SHIPMENT

Method of Delivery: Commercial Carrier **Tracking Number:** Fed Ex

COC Forms: ☑ Shipped with samples ☐ No Forms

Cooler(s)/Box(es)

Cntr	Type	Tracking No.	Seal	Seal	Container	Therm.	Temp C	Smps
1 of 1	Cooler	2797 1861 4610	Custody Seals	Intact	Intact	Therm_1	2.5	10

Samples

Sample Labels:
☑ Sample labels agree with COC forms
☐ Discrepancies (see Sample Custody Corrective Action Form)

Container Seals:
☐ Tape ☐ Custody Seals ☐ Other Seals (See sample Log)
☑ Seals intact for each shipping container
☐ Seals broken (See sample log for impacted samples)

Condition of Samples:
☑ Sample containers intact
☐ Sample containers broken/leaking (See Custody Corrective Action Form)

Temperature upon receipt (°C): 2.5 Temperature Blank used ☑ Yes ☐ No
(Note: If temperature upon receipt differs from required conditions, see sample log comment field)

Samples Acidified: ☐ Yes ☐ No ☑ Unknown

Initial pH 5-9?: ☐ Yes ☐ No ☑ NA
If no, individual sample adjustments on the Auxiliary Sample Receipt Form

Total Residual Chlorine Present?: ☐ Yes ☐ No ☑ NA
If yes, individual sample adjustments on the Auxiliary Sample Receipt Form

Head Space <1% in samples for water VOC analysis: ☐ Yes ☐ No ☑ NA
Individual sample deviations noted on sample log

Samples Containers:
Samples returned in PC-grade jars: ☐ Yes ☐ No ☑ Unknown /Lot No.: UnKnown

Storage Location: Custody: Refrigerator - R0119 (NA) **BDO IDs Assigned:** E9337 - E9346

Samples logged in by: Schumitz, Matt **Date/Time:** 10/29/2022 12:00 PM

Approved By: **Approved On:**

Authorized By: **Authorized On:**

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ShpNo: SHP-221031-02

Battelle Project No: 026.000001

Report Corrective Actions

Corrective Action No: 1 **of** 1

Authorized ☐ Approved: ☐

COC Client: Jacobs
COC Project: PNW PFAS SI NBK Keyport
COC Date: 10/31/2022 11:0

	Description of Problem:	Explanation:
Client Id	Other	The ID and collection date do not match for sample E9337 COC reads NBKK-IDW01-SO-102722 with a date of 10/27/22 but the sample container reads NBKK-IDW01-SO-102622 with a date of 10/26/22

Documentation of project manager notification

Sample Custodian Schumitz, Matt **Date:** 10/31/2022 2:19:00 P
Laboratory Manager: Thorn, Jonathan **Date:** 11/1/2022 9:47:00 AM
Project Manager: Thorn, Jonathan **Date:** 11/1/2022 9:47:00 AM

Documentation of client notification (should be completed by project manager within 24 hrs):

On 31-Oct-22 **I contacted** Acaron, Juan **at** CH2M

Results of communication with client (Describe any corrective action directed by the client):

see email

Date this form was received back to the custodian:
Reference Number:

From: Shiroodi, Kim
To: Schumitz, Matt (US); Acaron, Juan
Cc: Thorn, Jonathan (US); Lizotte Jr, Robert (US); Davis, Tiffany; Camus, Seng
Subject: RE: CTO-4117 BNC, MFD, Keyport 10/31/22
Date: Tuesday, November 1, 2022 9:26:07 AM
Attachments: image001.png

[Message received from outside the Battelle network. Carefully examine it before you open any links or attachments]

Please label the sample to match the chain with a date of 102722. Thanks!

Kim Shiroodi | Jacobs [jacobs.com] | Project Chemist
O:+1.773.693.3809 | M:+1.630.506.1247 | kim.shiroodi@jacobs.com
8735 West Higgins Road, Suite 400 | Chicago, IL 60631 | US

From: Schumitz, Matt (US) <SCHUMITZM@battelle.org>
Sent: Monday, October 31, 2022 3:31 PM
To: Acaron, Juan <Juan.Acaron@jacobs.com>
Cc: Thorn, Jonathan R <thorn@battelle.org>; Lizotte Jr, Robert (US) <lizotte@battelle.org>; Davis, Tiffany <tiffany.davis1@jacobs.com>; Camus, Seng <Seng.Camus@jacobs.com>; Shiroodi, Kim <Kim.Shiroodi@jacobs.com>
Subject: [EXTERNAL] CTO-4117 BNC, MFD, Keyport 10/31/22

Hello All

The attached custody records are for the samples received on Saturday all in good condition.

1 small discrepancy on the Keyport shipment that will need to be addressed

The ID and collection date do not match for sample E9337
COC reads NBKK-IDW01-SO-102722 with a date of 10/27/22 but the sample container reads NBKK-IDW01-SO-102622 with a date of 10/26/22

Results will be reported as follows:

SDG	Matrix	Due date	

22-1941	Water	12/2/22 (28-day TAT)	BNC
22-1943	Solids	12/2/22 (28-day TAT)	Keyport IDW
22-1944	Solids	12/2/22 (28-day TAT)	Keyport
22-1945	Water	12/2/22 (28-day TAT)	Keyport IDW
22-1946	Water	12/2/22 (28-day TAT)	Keyport
22-1947	Solid	12/2/22 (28-day TAT)	MFD
22-1948	Solid	12/2/22 (28-day TAT)	MFD

Thanks Matt

Matthew Schumitz
Technician Specialist / Sample Custodian
Hazardous Waste Coordinator
Analytical Chemistry Services
Office: 781.681.5588
schumitzm@battelle.org

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ShpNo SHP-221031-02

Battelle Project No:026.000001

Sample Receipt Form Details

Approved: ☐ Authorized ☐

Project Number: 704758CH **Client:** Jacobs

Received by: Schumitz, Matt **Date/Time Received:** Saturday, October 29, 2022 12:00 PM

No. of Shipping Containers: 1

BDO Id:	Client Sample ID:	Collection Date:	Login Date:	Ctrs:	Matrix:	Temp:	pH:	TRC:	VOC:	Stored In:	Loc:	No:	Comments:
E9337	NBKK-IDW01-SO-102722	10/27/22 13:00	10/31/22 11:08	1	SOIL	2.5	NA	NA	NA	R0119 (NA)			
E9338	NBKK-IDW02-SO-102722	10/27/22 13:45	10/31/22 11:08	1	SOIL	2.5	NA	NA	NA	R0119 (NA)			
E9339	NBKK-IDW03-SO-102722	10/27/22 14:15	10/31/22 11:08	1	SOIL	2.5	NA	NA	NA	R0119 (NA)			
E9340	NBKK-IDW04-AQ-102722	10/27/22 15:00	10/31/22 11:09	2	WATER	2.5	NA	NA	NA	R0119 (NA)			
E9341	NBKK-S7-SS02-0001	10/27/22 11:25	10/31/22 11:09	1	SOIL	2.5	NA	NA	NA	R0119 (NA)			
E9342	NBKK-S7-SS02-0001 MS	10/27/22 11:25	10/31/22 11:10	1	SOIL	2.5	NA	NA	NA	R0119 (NA)			
E9343	NBKK-S7-SS02-0001 MSD	10/27/22 11:25	10/31/22 11:10	1	SOIL	2.5	NA	NA	NA	R0119 (NA)			
E9344	NBKK-S7-EB01-102722-SO	10/27/22 11:45	10/31/22 11:10	2	WATER	2.5	NA	NA	NA	R0119 (NA)			
E9345	NBKK-S7-SB02-1011	10/27/22 15:15	10/31/22 11:11	1	SOIL	2.5	NA	NA	NA	R0119 (NA)			
E9346	NBKK-S7-SS01-0102	10/28/22 10:00	10/31/22 11:11	1	SOIL	2.5	NA	NA	NA	R0119 (NA)			

Total Samples: 10

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Chain of Custody

Project Name: PNW PFAS SI NBK-Keyport	**Client Project Manager:** Dennis Ballam	**Client Project Number:** 704758CH	**COC Number:**
Deliver Results to: Juan Acaron	**Samples Collected by:** Ilka Dinkelman		**Turnaround Time[2]:** ☐ 28-days (standard) ☐ 21-days (Rush) ☐ 14-days (Rush) ☐ 7-days (Rush) ☐ 3-day (Rush)
Address:	**Phone:** 775-336-9176		
	Email: ilka.dinkelman@jacobs.com		
Phone: 352-384-7002	**Time Zone:**		
Email: Juan.acaron@jacobs.com	**PO reference:**		

Sample ID	Date	Time	Type[3]	Matrix	Count	Lab ID	Test / Preservative[1]: PFAS	Sample Comments
NBKK-IDW01-SO-102722	10/27	1300		Soil	1	E9337	1	
NBKK-IDW02-SO-102722	10/27	1345		Soil	1	E9338	1	
NBKK-IDW03-SO-102722	10/27	1415		Soil	1	E9339	1	
NBKK-IDW04-AQ-102722	10/27	1500		Water	2	E9340	2	

Relinquished by (Print/Sign):	Company:	Date/Time:	Received by (Print/Sign):	Company:	Date/Time:
Griffin Riley	Jacobs	10/28 1300		BNO	10/29/22 1200
Relinquished by (Print/Sign):	Company:	Date/Time:	Received by (Print/Sign):	Company:	Date/Time:
Relinquished by (Print/Sign):	Company:	Date/Time:	Received by (Print/Sign):	Company:	Date/Time:

Field Project comments:	Receipt comments:

[1] include comments in the Field Project comment field if there are method specific requirements, i.e., "WHO PCB Congener list", "PFAS – 18 analytes", or "PFAS – 29 analytes from UCMR5"

[2] Rush TAT request should be verified with the lab prior to submitting samples

[3] Client sample type, if applicable

BATTELLE

Chain of Custody

Project Name: PNW PFAS SI NBK-Inreport	Client Project Manager: Dennis Ballam	Client Project Number: 704758CH
Deliver Results to: Juan Acaron	Samples Collected by: Ilka Dinkelman	
Address:	Phone: 775-336-9176	
	Email: ilka.dinkelman@jacobs.com	
Phone: 352-384-7002	Time Zone:	
Email: Juan.acaron@jacobs.com	PO reference:	

Test / Preservative[1]: PFAS

COC Number:

Turnaround Time[2]:
- ☐ 28-days (standard)
- ☐ 21-days (Rush)
- ☐ 14-days (Rush)
- ☐ 7-days (Rush)
- ☐ 3-day (Rush)

Sample ID	Date	Time	Type[3]	Matrix	Count	Lab ID	PFAS	Sample Comments
NBKK-57-SS02-0001	10/27	11:25		Soil	1	E9341	1	
NBKK-57-SS02-0001MS	10/27	11:25		Soil	1	E9342	1	
NBKK-57-SS02-0001MSD	10/27	11:25		Soil	1	E9343	1	
NBKK-57-EB01-102722-SO	10/27	11:45		Water	2	E9344	2	
NBKK-57-SB02-1011	10/27	15:15		Soil	1	E9345	1	
NBKK-57-SS01-0102	10/28	10:00		Soil	1	E9346	1	

	Company:	Date/Time:	Received by (Print/Sign):	Company:	Date/Time:
Relinquished by (Print/Sign): Griffin Riley	Jacobs	10/28 1300		BNO	10/29/22 1200
Relinquished by (Print/Sign):	Company:	Date/Time:	Received by (Print/Sign):	Company:	Date/Time:
Relinquished by (Print/Sign):	Company:	Date/Time:	Received by (Print/Sign):	Company:	Date/Time:

Field Project comments:

Receipt comments:

[1] include comments in the Field Project comment field if there are method specific requirements, i.e., "WHO PCB Congener list", "PFAS – 18 analytes", or "PFAS – 29 analytes from UCMR5"

[2] Rush TAT request should be verified with the lab prior to submitting samples

[3] Client sample type, if applicable

ORIGIN ID:PWTA (503) 410-1217
JACOBS
5701 CLEVELAND ST STE 200
VIRGINIA BEACH, VA 23462
UNITED STATES US

SHIP DATE: 28OCT22
ACTWGT: 47.45 LB
CAD: 6992271/SSF02341
DIMS: 24x13x14 IN
BILL THIRD PARTY

TO MATT SCHUMITZ
BATTELLE ANALYTICAL SERVICES
1125 SOMERSET AVE

2.5 °C
Therm1

TAUNTON MA 02780
(000) 000-0000
INV:
PO:
REF:
DEPT:

FedEx Express

TRK# 0201 2797 1861 4610

SATURDAY 12:00P
PRIORITY OVERNIGHT

XO UWAA

AHS RES
02780
MA-US BOS

Part # 156297-[illegible] REV 09/23

Data Tables

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-IDW01-SO-102722
Battelle ID	E9337-FS
Sample Type	SA
Collection Date	10/27/2022
Extraction Date	11/08/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	12.75
Matrix	SOIL
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.500 U	E9337-FS(0)	1.000	11/12/2022	0.178	0.500	1.00
PFHpA	375-85-9	0.500 U	E9337-FS(0)	1.000	11/12/2022	0.168	0.500	1.00
PFOA	335-67-1	0.500 U	E9337-FS(0)	1.000	11/12/2022	0.214	0.500	1.00
PFNA	375-95-1	0.500 U	E9337-FS(0)	1.000	11/12/2022	0.157	0.500	1.00
PFDA	335-76-2	0.500 U	E9337-FS(0)	1.000	11/12/2022	0.158	0.500	1.00
PFUnA	2058-94-8	0.500 U	E9337-FS(0)	1.000	11/12/2022	0.156	0.500	1.00
PFDoA	307-55-1	0.500 U	E9337-FS(0)	1.000	11/12/2022	0.160	0.500	1.00
PFTrDA	72629-94-8	0.500 U	E9337-FS(0)	1.000	11/12/2022	0.161	0.500	1.00
PFTeDA	376-06-7	0.500 U	E9337-FS(0)	1.000	11/12/2022	0.162	0.500	2.00
NMeFOSAA	2355-31-9	0.500 U	E9337-FS(0)	1.000	11/12/2022	0.159	0.500	2.00
NEtFOSAA	2991-50-6	0.500 U	E9337-FS(0)	1.000	11/12/2022	0.165	0.500	2.00
PFBS	375-73-5	0.500 U	E9337-FS(0)	1.000	11/12/2022	0.171	0.500	1.00
PFHxS	355-46-4	0.500 U	E9337-FS(0)	1.000	11/12/2022	0.173	0.500	1.00
PFOS	1763-23-1	0.500 U	E9337-FS(0)	1.000	11/12/2022	0.175	0.500	1.00
HFPO-DA	13252-13-6	0.500 U	E9337-FS(0)	1.000	11/12/2022	0.159	0.500	2.00
Adona	919005-14-4	0.500 U	E9337-FS(0)	1.000	11/12/2022	0.160	0.500	2.00
9Cl-PF3ONS	756426-58-1	0.500 U	E9337-FS(0)	1.000	11/12/2022	0.154	0.500	2.00
11Cl-PF3OUdS	763051-92-9	0.500 U	E9337-FS(0)	1.000	11/12/2022	0.150	0.500	2.00

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-IDW01-SO-102722
Battelle ID	E9337-FS
Sample Type	SA
Collection Date	10/27/2022
Extraction Date	11/08/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS

Surrogate Recoveries (%)	Recovery	Extract ID	Analysis Date
13C5-PFHxA	87	E9337-FS(0)	11/12/2022
13C4-PFHpA	86	E9337-FS(0)	11/12/2022
13C8-PFOA	90	E9337-FS(0)	11/12/2022
13C9-PFNA	93	E9337-FS(0)	11/12/2022
13C6-PFDA	90	E9337-FS(0)	11/12/2022
13C7-PFUnA	89	E9337-FS(0)	11/12/2022
13C2-PFDoA	88	E9337-FS(0)	11/12/2022
13C2-PFTeDA	82	E9337-FS(0)	11/12/2022
d3-MeFOSAA	75	E9337-FS(0)	11/12/2022
d5-EtFOSAA	84	E9337-FS(0)	11/12/2022
13C3-PFBS	81	E9337-FS(0)	11/12/2022
13C3-PFHxS	86	E9337-FS(0)	11/12/2022
13C8-PFOS	82	E9337-FS(0)	11/12/2022
13C3-HFPO-DA	74	E9337-FS(0)	11/12/2022

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-IDW02-SO-102722
Battelle ID	E9338-FS
Sample Type	SA
Collection Date	10/27/2022
Extraction Date	11/08/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	11.49
Matrix	SOIL
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.500 U	E9338-FS(0)	1.000	11/12/2022	0.178	0.500	1.00
PFHpA	375-85-9	0.500 U	E9338-FS(0)	1.000	11/12/2022	0.168	0.500	1.00
PFOA	335-67-1	0.500 U	E9338-FS(0)	1.000	11/12/2022	0.214	0.500	1.00
PFNA	375-95-1	0.500 U	E9338-FS(0)	1.000	11/12/2022	0.157	0.500	1.00
PFDA	335-76-2	0.500 U	E9338-FS(0)	1.000	11/12/2022	0.158	0.500	1.00
PFUnA	2058-94-8	0.500 U	E9338-FS(0)	1.000	11/12/2022	0.156	0.500	1.00
PFDoA	307-55-1	0.500 U	E9338-FS(0)	1.000	11/12/2022	0.160	0.500	1.00
PFTrDA	72629-94-8	0.500 U	E9338-FS(0)	1.000	11/12/2022	0.161	0.500	1.00
PFTeDA	376-06-7	0.500 U	E9338-FS(0)	1.000	11/12/2022	0.162	0.500	2.00
NMeFOSAA	2355-31-9	0.500 U	E9338-FS(0)	1.000	11/12/2022	0.159	0.500	2.00
NEtFOSAA	2991-50-6	0.500 U	E9338-FS(0)	1.000	11/12/2022	0.165	0.500	2.00
PFBS	375-73-5	0.500 U	E9338-FS(0)	1.000	11/12/2022	0.171	0.500	1.00
PFHxS	355-46-4	0.500 U	E9338-FS(0)	1.000	11/12/2022	0.173	0.500	1.00
PFOS	1763-23-1	0.500 U	E9338-FS(0)	1.000	11/12/2022	0.175	0.500	1.00
HFPO-DA	13252-13-6	0.500 U	E9338-FS(0)	1.000	11/12/2022	0.159	0.500	2.00
Adona	919005-14-4	0.500 U	E9338-FS(0)	1.000	11/12/2022	0.160	0.500	2.00
9Cl-PF3ONS	756426-58-1	0.500 U	E9338-FS(0)	1.000	11/12/2022	0.154	0.500	2.00
11Cl-PF3OUdS	763051-92-9	0.500 U	E9338-FS(0)	1.000	11/12/2022	0.150	0.500	2.00

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-IDW02-SO-102722
Battelle ID	E9338-FS
Sample Type	SA
Collection Date	10/27/2022
Extraction Date	11/08/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS

Surrogate Recoveries (%)	**Recovery**	**Extract ID**	**Analysis Date**
13C5-PFHxA	81	E9338-FS(0)	11/12/2022
13C4-PFHpA	81	E9338-FS(0)	11/12/2022
13C8-PFOA	82	E9338-FS(0)	11/12/2022
13C9-PFNA	80	E9338-FS(0)	11/12/2022
13C6-PFDA	90	E9338-FS(0)	11/12/2022
13C7-PFUnA	84	E9338-FS(0)	11/12/2022
13C2-PFDoA	64	E9338-FS(0)	11/12/2022
13C2-PFTeDA	62	E9338-FS(0)	11/12/2022
d3-MeFOSAA	70	E9338-FS(0)	11/12/2022
d5-EtFOSAA	59	E9338-FS(0)	11/12/2022
13C3-PFBS	80	E9338-FS(0)	11/12/2022
13C3-PFHxS	97	E9338-FS(0)	11/12/2022
13C8-PFOS	76	E9338-FS(0)	11/12/2022
13C3-HFPO-DA	78	E9338-FS(0)	11/12/2022

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-IDW03-SO-102722
Battelle ID	E9339-FS
Sample Type	SA
Collection Date	10/27/2022
Extraction Date	11/08/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	13.10
Matrix	SOIL
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.500 U	E9339-FS(0)	1.000	11/12/2022	0.178	0.500	1.00
PFHpA	375-85-9	0.500 U	E9339-FS(0)	1.000	11/12/2022	0.168	0.500	1.00
PFOA	335-67-1	0.500 U	E9339-FS(0)	1.000	11/12/2022	0.214	0.500	1.00
PFNA	375-95-1	0.500 U	E9339-FS(0)	1.000	11/12/2022	0.157	0.500	1.00
PFDA	335-76-2	0.500 U	E9339-FS(0)	1.000	11/12/2022	0.158	0.500	1.00
PFUnA	2058-94-8	0.500 U	E9339-FS(0)	1.000	11/12/2022	0.156	0.500	1.00
PFDoA	307-55-1	0.500 U	E9339-FS(0)	1.000	11/12/2022	0.160	0.500	1.00
PFTrDA	72629-94-8	0.500 U	E9339-FS(0)	1.000	11/12/2022	0.161	0.500	1.00
PFTeDA	376-06-7	0.500 U	E9339-FS(0)	1.000	11/12/2022	0.162	0.500	2.00
NMeFOSAA	2355-31-9	0.500 U	E9339-FS(0)	1.000	11/12/2022	0.159	0.500	2.00
NEtFOSAA	2991-50-6	0.500 U	E9339-FS(0)	1.000	11/12/2022	0.165	0.500	2.00
PFBS	375-73-5	0.500 U	E9339-FS(0)	1.000	11/12/2022	0.171	0.500	1.00
PFHxS	355-46-4	0.252 J	E9339-FS(0)	1.000	11/12/2022	0.173	0.500	1.00
PFOS	1763-23-1	5.47	E9339-FS(0)	1.000	11/12/2022	0.175	0.500	1.00
HFPO-DA	13252-13-6	0.500 U	E9339-FS(0)	1.000	11/12/2022	0.159	0.500	2.00
Adona	919005-14-4	0.500 U	E9339-FS(0)	1.000	11/12/2022	0.160	0.500	2.00
9Cl-PF3ONS	756426-58-1	0.500 U	E9339-FS(0)	1.000	11/12/2022	0.154	0.500	2.00
11Cl-PF3OUdS	763051-92-9	0.500 U	E9339-FS(0)	1.000	11/12/2022	0.150	0.500	2.00

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-IDW03-SO-102722
Battelle ID	E9339-FS
Sample Type	SA
Collection Date	10/27/2022
Extraction Date	11/08/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS

Surrogate Recoveries (%)	**Recovery**	**Extract ID**	**Analysis Date**
13C5-PFHxA	85	E9339-FS(0)	11/12/2022
13C4-PFHpA	87	E9339-FS(0)	11/12/2022
13C8-PFOA	86	E9339-FS(0)	11/12/2022
13C9-PFNA	86	E9339-FS(0)	11/12/2022
13C6-PFDA	81	E9339-FS(0)	11/12/2022
13C7-PFUnA	76	E9339-FS(0)	11/12/2022
13C2-PFDoA	68	E9339-FS(0)	11/12/2022
13C2-PFTeDA	56	E9339-FS(0)	11/12/2022
d3-MeFOSAA	85	E9339-FS(0)	11/12/2022
d5-EtFOSAA	69	E9339-FS(0)	11/12/2022
13C3-PFBS	88	E9339-FS(0)	11/12/2022
13C3-PFHxS	76	E9339-FS(0)	11/12/2022
13C8-PFOS	76	E9339-FS(0)	11/12/2022
13C3-HFPO-DA	79	E9339-FS(0)	11/12/2022

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	LT49 IB
Battelle ID	LT49 IB_11/11/2022
Sample Type	IB
Collection Date	NA
Extraction Date	NA
Analysis Date	11/11/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	NA
Matrix	Solid
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	DL	LOD	LOQ
PFHxA	307-24-4	0.500 U	0.178	0.500	1.00
PFHpA	375-85-9	0.500 U	0.168	0.500	1.00
PFOA	335-67-1	0.500 U	0.214	0.500	1.00
PFNA	375-95-1	0.500 U	0.157	0.500	1.00
PFDA	335-76-2	0.500 U	0.158	0.500	1.00
PFUnA	2058-94-8	0.500 U	0.156	0.500	1.00
PFDoA	307-55-1	0.500 U	0.160	0.500	1.00
PFTrDA	72629-94-8	0.500 U	0.161	0.500	1.00
PFTeDA	376-06-7	0.500 U	0.162	0.500	2.00
NMeFOSAA	2355-31-9	0.500 U	0.159	0.500	2.00
NEtFOSAA	2991-50-6	0.500 U	0.165	0.500	2.00
PFBS	375-73-5	0.500 U	0.171	0.500	1.00
PFHxS	355-46-4	0.500 U	0.173	0.500	1.00
PFOS	1763-23-1	0.500 U	0.175	0.500	1.00
HFPO-DA	13252-13-6	0.500 U	0.159	0.500	2.00
Adona	919005-14-4	0.500 U	0.160	0.500	2.00
9Cl-PF3ONS	756426-58-1	0.500 U	0.154	0.500	2.00
11Cl-PF3OUdS	763051-92-9	0.500 U	0.150	0.500	2.00

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	LT49 IB
Battelle ID	LT49 IB_11/11/2022
Sample Type	IB
Collection Date	NA
Extraction Date	NA
Analysis Date	11/11/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	NA
Matrix	Solid
Sample Size	5.000
Size Unit-Basis	g

Surrogate Recoveries (%)

13C5-PFHxA	101
13C4-PFHpA	96
13C8-PFOA	98
13C9-PFNA	97
13C6-PFDA	112
13C7-PFUnA	101
13C2-PFDoA	95
13C2-PFTeDA	100
d3-MeFOSAA	99
d5-EtFOSAA	97
13C3-PFBS	99
13C3-PFHxS	105
13C8-PFOS	94
13C3-HFPO-DA	94

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	Procedural Blank
Battelle ID	DK852PB-FS
Sample Type	PB
Collection Date	11/08/2022
Extraction Date	11/08/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	0.00
Matrix	SOLID
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.500 U	DK852PB-FS(0)	1.000	11/12/2022	0.178	0.500	1.00
PFHpA	375-85-9	0.500 U	DK852PB-FS(0)	1.000	11/12/2022	0.168	0.500	1.00
PFOA	335-67-1	0.500 U	DK852PB-FS(0)	1.000	11/12/2022	0.214	0.500	1.00
PFNA	375-95-1	0.500 U	DK852PB-FS(0)	1.000	11/12/2022	0.157	0.500	1.00
PFDA	335-76-2	0.500 U	DK852PB-FS(0)	1.000	11/12/2022	0.158	0.500	1.00
PFUnA	2058-94-8	0.500 U	DK852PB-FS(0)	1.000	11/12/2022	0.156	0.500	1.00
PFDoA	307-55-1	0.500 U	DK852PB-FS(0)	1.000	11/12/2022	0.160	0.500	1.00
PFTrDA	72629-94-8	0.500 U	DK852PB-FS(0)	1.000	11/12/2022	0.161	0.500	1.00
PFTeDA	376-06-7	0.500 U	DK852PB-FS(0)	1.000	11/12/2022	0.162	0.500	2.00
NMeFOSAA	2355-31-9	0.500 U	DK852PB-FS(0)	1.000	11/12/2022	0.159	0.500	2.00
NEtFOSAA	2991-50-6	0.500 U	DK852PB-FS(0)	1.000	11/12/2022	0.165	0.500	2.00
PFBS	375-73-5	0.500 U	DK852PB-FS(0)	1.000	11/12/2022	0.171	0.500	1.00
PFHxS	355-46-4	0.500 U	DK852PB-FS(0)	1.000	11/12/2022	0.173	0.500	1.00
PFOS	1763-23-1	0.500 U	DK852PB-FS(0)	1.000	11/12/2022	0.175	0.500	1.00
HFPO-DA	13252-13-6	0.500 U	DK852PB-FS(0)	1.000	11/12/2022	0.159	0.500	2.00
Adona	919005-14-4	0.500 U	DK852PB-FS(0)	1.000	11/12/2022	0.160	0.500	2.00
9Cl-PF3ONS	756426-58-1	0.500 U	DK852PB-FS(0)	1.000	11/12/2022	0.154	0.500	2.00
11Cl-PF3OUdS	763051-92-9	0.500 U	DK852PB-FS(0)	1.000	11/12/2022	0.150	0.500	2.00

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	Procedural Blank
Battelle ID	DK852PB-FS
Sample Type	PB
Collection Date	11/08/2022
Extraction Date	11/08/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS

Surrogate Recoveries (%)	**Recovery**	**Extract ID**	**Analysis Date**
13C5-PFHxA	81	DK852PB-FS(0)	11/12/2022
13C4-PFHpA	82	DK852PB-FS(0)	11/12/2022
13C8-PFOA	91	DK852PB-FS(0)	11/12/2022
13C9-PFNA	90	DK852PB-FS(0)	11/12/2022
13C6-PFDA	85	DK852PB-FS(0)	11/12/2022
13C7-PFUnA	79	DK852PB-FS(0)	11/12/2022
13C2-PFDoA	85	DK852PB-FS(0)	11/12/2022
13C2-PFTeDA	92	DK852PB-FS(0)	11/12/2022
d3-MeFOSAA	93	DK852PB-FS(0)	11/12/2022
d5-EtFOSAA	94	DK852PB-FS(0)	11/12/2022
13C3-PFBS	90	DK852PB-FS(0)	11/12/2022
13C3-PFHxS	105	DK852PB-FS(0)	11/12/2022
13C8-PFOS	87	DK852PB-FS(0)	11/12/2022
13C3-HFPO-DA	77	DK852PB-FS(0)	11/12/2022

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	Laboratory Control Sample
Battelle ID	DK853LCS-FS
Sample Type	LCS
Collection Date	11/08/2022
Extraction Date	11/08/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	0.00
Matrix	SOLID
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	Target	Recovery	Qual	Control Limits Lower	Upper
PFHxA	307-24-4	8.03	DK853LCS-FS(0)	1.000	11/12/2022	8.00	100		70	132
PFHpA	375-85-9	8.15	DK853LCS-FS(0)	1.000	11/12/2022	8.00	102		71	131
PFOA	335-67-1	8.86	DK853LCS-FS(0)	1.000	11/12/2022	8.00	111		69	133
PFNA	375-95-1	7.21	DK853LCS-FS(0)	1.000	11/12/2022	8.00	90		72	129
PFDA	335-76-2	8.66	DK853LCS-FS(0)	1.000	11/12/2022	8.00	108		69	133
PFUnA	2058-94-8	9.06	DK853LCS-FS(0)	1.000	11/12/2022	8.00	113		64	136
PFDoA	307-55-1	7.73	DK853LCS-FS(0)	1.000	11/12/2022	8.00	97		69	135
PFTrDA	72629-94-8	7.96	DK853LCS-FS(0)	1.000	11/12/2022	8.00	100		66	139
PFTeDA	376-06-7	7.62	DK853LCS-FS(0)	1.000	11/12/2022	8.00	95		69	133
NMeFOSAA	2355-31-9	8.24	DK853LCS-FS(0)	1.000	11/12/2022	8.00	103		63	144
NEtFOSAA	2991-50-6	9.40	DK853LCS-FS(0)	1.000	11/12/2022	8.00	118		61	139
PFBS	375-73-5	7.48	DK853LCS-FS(0)	1.000	11/12/2022	8.00	94		72	128
PFHxS	355-46-4	8.52	DK853LCS-FS(0)	1.000	11/12/2022	8.00	107		67	130
PFOS	1763-23-1	8.32	DK853LCS-FS(0)	1.000	11/12/2022	8.00	104		68	136
HFPO-DA	13252-13-6	8.71	DK853LCS-FS(0)	1.000	11/12/2022	8.00	109		71	153
Adona	919005-14-4	9.44	DK853LCS-FS(0)	1.000	11/12/2022	8.00	118		61	139
9Cl-PF3ONS	756426-58-1	7.61	DK853LCS-FS(0)	1.000	11/12/2022	8.00	95		60	140
11Cl-PF3OUdS	763051-92-9	7.90	DK853LCS-FS(0)	1.000	11/12/2022	8.00	99		40	160

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	Laboratory Control Sample
Battelle ID	DK853LCS-FS
Sample Type	LCS
Collection Date	11/08/2022
Extraction Date	11/08/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS

Surrogate Recoveries (%)	Recovery	Extract ID	Analysis Date
13C5-PFHxA	82	DK853LCS-FS(0)	11/12/2022
13C4-PFHpA	87	DK853LCS-FS(0)	11/12/2022
13C8-PFOA	90	DK853LCS-FS(0)	11/12/2022
13C9-PFNA	89	DK853LCS-FS(0)	11/12/2022
13C6-PFDA	82	DK853LCS-FS(0)	11/12/2022
13C7-PFUnA	76	DK853LCS-FS(0)	11/12/2022
13C2-PFDoA	75	DK853LCS-FS(0)	11/12/2022
13C2-PFTeDA	74	DK853LCS-FS(0)	11/12/2022
d3-MeFOSAA	84	DK853LCS-FS(0)	11/12/2022
d5-EtFOSAA	81	DK853LCS-FS(0)	11/12/2022
13C3-PFBS	89	DK853LCS-FS(0)	11/12/2022
13C3-PFHxS	86	DK853LCS-FS(0)	11/12/2022
13C8-PFOS	86	DK853LCS-FS(0)	11/12/2022
13C3-HFPO-DA	87	DK853LCS-FS(0)	11/12/2022

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Glossary of Data Qualifiers

Flag:	Application:
B	Analyte found in the sample at a concentration <10x the level found in the procedural blank
D	Dilution Run. Initial run outside the initial calibration range of the instrument
E	Estimate, result is greater than the highest concentration level in the calibration
J	Analyte detected below the Limit of Quantitation (LOQ)
MI	Significant Matrix Interference - value could not be determined.
N	Quality Control (QC) value is outside the accuracy or precision Data Quality Objective (DQO)
NA	Not Applicable
T	Holding Time (HT) exceeded
U	Analyte not detected or detected below the Detection Limit (DL) value, Limit of Detection (LOD) reported
Q	Ion ratio outside of criteria (50% difference from calibration expected ratio)

CTO-4117: Northwest PFAS Investigation
Project No G25161.X1.XX.0026.000001
PFAS by DoD QSM 5.3 Table B-15

WATER

Batch 22-1945

Package DP-22-2007

Submitted to:
CH2M
5701 Cleveland Street
Virginia Beach, VA 23462 USA

Submitted by:
Battelle Norwell Operations
141 Longwater Drive Suite 202
Norwell, MA 02061

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CTO-4117: Northwest PFAS Investigation
Project No G25161.X1.XX.0026.000001
PFAS by DoD QSM 5.3 Table B-15

WATER

Batch 22-1945

Package DP-22-2007

Submitted to:
CH2M
5701 Cleveland Street
Virginia Beach, VA 23462 USA

NELAP Accreditation Number: E87856 (Florida Department of Health)
DoD-ELAP Accreditation Number: 91667

Submitted by:
Battelle Norwell Operations
141 Longwater Drive Suite 202
Norwell, MA 02061

Analyst Approval: Kelsey Harnden 2022.12.02 12:15:19 -05'00'

QC Chemist Approval: Deb Huntress 2022.12.02 16:19:54 -05'00'

Project Manager Approval: Jonathan Thorn 2022.12.02 16:59:08 -05'00'

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CTO-4117: Northwest PFAS Investigation
Project No G25161.X1.XX.0026.000001
PFAS by DoD QSM 5.3 Table B-15

WATER

Batch 22-1945

Package DP-22-2007

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Master Signature Page

Name (Printed)	Signature	Initials	Date
Jonathan Thorn		JRT	1/9/2020
Robert Lizotte, Jr.		BL	1.9.2020
Elyn M Fitch		EMF	1/9/2020
Carla Devine		CRD	1/9/2020
Denise Schumitz		DS	1/9/2020
Lauren Griffith		LMG	1.9.2020
Carrie P McCarthy		CPM	1/9/2020
Rich Restuccia		RR	1/9/2020
Sam Guimaraes		SAG	1/9/2020
Jordan Tower		JLT	1/9/2020
Christie Usher		CU	1/9/2020
Kevin McInerney		KM	1/14/2020
Matt Schumitz		MDS	1/14/2020
Weidong Li		W.L	1/14/2020
Kayla Lamarre		KAL	1/14/2020
MUNAZ MUNTASIR		MM	01/14/2020
Kristen Nichols		KN	01/14/2020
Kelsey Harnden		KH	01/30/2020
Kevin Bailey		KB	1/30/2020
Stephanie Schultz		SAS	1/30/2020

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Name (Printed)	Signature	Initials	Date
Clinicea Brown		CB	01/30/20
Ryan Kelly		RK	01/30/20
KAREN HYPPOLITE		K.H.	01/31/20
Gail DeRuzzo		GD	01/31/2020
Tracy Stenner			1/31/2020
Ashley Wellington		AW	1131/2020
Daniel Cooney		DAC	1/31/2020
Peter Demers		PD	1/31/2020
Andy Delmar		AD	3/19/2021
Emily Reardon		ER	3/19/2021
Brenton Murphy		Bm	3/19/2021
Haley Hart		H H	3/19/21
Allison Wamaess		AW	3/19/21
Taylor Noonan		TN	3/19/21
FRANCO PALA		FP	3/19/21
Amina Chamanlal		AC	11/03/21
J Michelle Wentzell		MW	11-3-21
Zachary Dreiker		ZD	11/3/21
Drew Croke		DC	11/3/21
Zachary Willenberg		ZW	11/3/21

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Name (Printed)	Signature	Initials	Date
Hayley Beal	Hayley Beal	HB	5/9/2022
Nathaniel Kinsman	Nathaniel Kinsman	NK	5/9/2022
Debra Huntress	Debra Huntress	DHU	5/9/22
Vincent Urso	Vincent Urso	VU	5/9/22

Sample Summary

Client: CH2M (Jacobs)
SDG: 22-1945
Project/Site: NBK Keyport
CTO: 4117

Lab Sample ID	Client Sample ID	Matrix	Collection Date	Receipt Date
DK856PB-FS	Procedural Blank	WATER	11/7/2022	11/7/2022
DK857LCS-FS	Laboratory Control Sample	WATER	11/7/2022	11/7/2022
E9340-FS	NBKK-IDW04-AQ-102722	WATER	10/27/2022	10/29/2022

Work Plan

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WORK/QUALITY ASSURANCE PROJECT PLAN

1.0 GENERAL PROJECT INFORMATION

Project Title:	CTO-4117: NBK Keyport PFAS in water
Project Number:	G25161.X1.XX.0026.000001
Client:	CH2M 5701 Cleveland Street Suite 200 Virginia Beach, VA 23462 USA
Client Contact Information:	Juan Acaron Project Chemist (352) 331-8121(V) NA juan.acaron@jacobs.com
Effective Date of QAPP:	9/12/2022
Version Number:	G25161.X1.XX.0026.000001(L)-11
Project Manager:	Thorn, Jonathan
Laboratory Task Manager:	Thorn, Jonathan
Deliverable Due Date:	10/14/2022

2.0 SCOPE OF WORK

Overview:	Analysis of water samples for PFAS (18 Analytes)
Matrix:	Water

2.1 TECHNICAL APPROACH

2.1.1 Sample Receipt, Storage, and Handling

The list of samples for this project plan are presented in Attachment 1.

Storage Directions:	Store refrigerated.
Sub_Sampling:	None
Procedures:	NA
Contact:	NA
Comment:	NA
Archiving:	Dispose of excess samples after six months.
Disposal:	Dispose of excess samples in the appropriate waste stream.

2.1.2 Sample Preparation

None.

Samples Expected:	Samples Per Batch:	Batches Expected:
20	20	1

Batch quality control samples are defined in Table 1.

Target samples are presented in Attachment 1.

Table 1: Quality Control Samples

Type:	*Description:*	*Count:*	*Rgt:*	*Reference:*	*Comment:*
PB	Laboratory control reagent blank.	1 per batch	--	NA	
LCS	Laboratory Control Sample	1 per batch	No	NA	
MS	Spiked field sample for determining method accuracy in the presence of matrix.	1 per batch	--	NA	
MSD	Spiked field sample for determining method accuracy and precision in the presence of matrix.	1 per batch	--	NA	

2.1.3 Extraction/Preparation

2.1.3.1 Extraction

SOP No.-Rev: **5-370-13**

SOP Title: *Extraction of Poly and Perfluoroalkyl Substances from Environmental Matrices*

Sample Size: 250.00 ml

SIS and LCS/MS Compounds: Defined in Table 2.

Deviations: None.

Comments: None.

Table 2: SIS and LCS/MS Spiking Level

Standard Type	Standard Contents		Spike Amount (ng)	Volume (uL)	Comment
PFAS DoD Surrogate (18 Targets)	LS23	SIS	~ 25.0 ng	50 uL	NA
PFAS DoD Second Source LCS/MS (18 Analytes)	LR93	LCS/MS	~ 40 ng	100 uL	Vary spike between 25 and 150 µL

2.1.3.2 Cleanup

None.

RIS spiking levels are presented in Table 3.

Extract PIV (uL): 5000

Table 3: RIS Spiking Level

Standard Type	Standard Contents	Spike Amount (ng)	Volume (uL)	Comment
PFAS DoD Internal Standards	LS03 RIS	~ 25.0 ng	50 uL	NA

2.1.4 Instrumental Analysis

The list of analytes along with data quality criteria are presented in Attachment 2.

1) SOP_No-Rev: **5-369-09**

SOP_Title: *Analysis of Perfluoroalkyl Substances in Environmental Samples by Liquid Chromatography and Tandem Mass Spectrometry (LC-MS/MS)*

Deviations: None

Comments: None

2.2. DELIVERABLES

Deliverables Due:	10/14/2022
LIMS Reports:	*No*
Histograms:	*No*
Excel Tables:	*No*
EICs:	*No*
Chromatograms:	*No*
EDDs:	*No*
Comments:	• Individual data sets will be due 28 days after receipt of each sample set. • Select data sets have expedited TAT. • Full Level 4 data package (QSM 5.3 Table B-15 compliant) required. • CH2M EDD required. • WO 148003519

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WORK/QUALITY ASSURANCE PROJECT PLAN

3.0 QUALITY

The Method Quality Objectives are defined in Attachment 3.

4.0 ORGANIZATION AND COMMUNICATION

4.1 ORGANIZATION

The project team is defined in Table 4. Supervisors may make substitutions with Project Manager concurrence.

Table 4: Project Team and Roles

Staff Member	Role	Comment
Jonathan R. Thorn	Project Manager	NA
Kelsey Harnden	Sample Preparation	NA
Denise M. Schumitz	LC-MS/MS Analysis	NA
Matt D. Schumitz	Sample Custody	NA
Carla R. Devine	Quality Control Officer	NA
Zachary J. Willenberg	Quality Assurance Officer	NA

4.2 COMMUNICATION

A kick-off meeting will be held to discuss project scope and goals.

5.0 SCHEDULE

The project schedule is presented in Table 5.

Table 5. Schedule of Laboratory Activities

Activity:	Start Date:	End Date:	TAT (days):	Comment:
Sample Receipt	09/12/2022	09/12/2022	0	NA
Sample Preparation	09/12/2022	09/30/2022	18	NA
Instrument Analysis	09/30/2022	10/13/2022	13	NA
Quality Control Review	10/13/2022	10/14/2022	1	NA
Quality Assurance Review	10/14/2022	10/14/2022	0	NA

6.0 BUDGET

The labor budget for the analytical task is presented in Table 6.

Table 6. Labor Budget (Laboratory Analytical Task)

Labor Activity:	Hours/ Batch:	Batches:	Total Hours:	Comment:
Sample Receipt	2	1	2	Hours per 12 samples
Sample Preparation	5	1	5	Hours per 12 samples
Instrument Analysis	5	1	5	Hours per 12 samples
Quality Control Review	2	1	2	1.5 hours per 12 samples
Quality Assurance Review	1	1	1	Hours per 12 samples

7.0 STAFF DEVELOPMENT

None anticipated.

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WORK/QUALITY ASSURANCE PROJECT PLAN

Attachment 1: Target Samples

Shipment: **SHP-220912-02**

Status: Pending

Description: NBK Keyport PFAS SI

Range: E6464-E6465

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	E6464	NBKK-B76-FB01-090122	09/01/2022 1:25 pm	AQ	R0119 (NA)			
2	E6465	NBKK-B76-EB01-090222-SO	09/02/2022 10:55 am	AQ	R0119 (NA)			

Shipment: **SHP-221004-07**

Status: Pending

Description: NBK Keyport

Range: E7805-E7808

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	E7805	NBKK-CF1-EB01-093022-SO	09/30/2022 10:33 am	WATER	R0119 (NA)			
2	E7808	NBKK-B1006-EB01-093022-SO	09/30/2022 12:25 pm	WATER	R0119 (NA)			

Shipment: **SHP-221011-05**

Status: Pending

Description: PNW PFAS SI NBK KEYPORT

Range: E8157-E8157

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	E8157	NBKK-LFEX-EB01-100422-SO	10/04/2022 3:20 pm	AQ	R0119 (NA)			

Shipment: **SHP-221013-06**

Status: Pending

Description: PNW PFAS SI NBK-KEYPART

Range: E8358-E8364

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	E8358	NBKK-LFEX-FB01-100622	10/06/2022 2:00 pm	WATER	R0119 (NA)			
2	E8364	NBKK-CF1-EB01-10082022-SO	10/08/2022 12:40 pm	WATER	R0119 (NA)			

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WORK/QUALITY ASSURANCE PROJECT PLAN

Shipment: **SHP-221019-07**

Status: Pending

Description: PNW PFAS SI NBK-Keyport

Range: E8544-E8545

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	E8544	NBKK-B1006-FB01-101122	10/11/2022 3:45 pm	WATER	R0119 (NA)			
2	E8545	NBKK-CF1-FB01-101322	10/13/2022 11:40 am	WATER	R0119 (NA)			

Shipment: **SHP-221028-01**

Status: Pending

Description: PNW PFAS SI NBK-KEYPORT

Range: E9287-E9290

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	E9290	NBKK-S7-FB01-102622	10/26/2022 2:00 pm	WATER	R0119 (NA)			

Shipment: **SHP-221031-02**

Status: Pending

Description: PNW PFAS SI NBK Keyport

Range: E9340-E9344

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	E9340	NBKK-IDW04-AQ-102722	10/27/2022 3:00 pm	WATER	R0119 (NA)			
2	E9344	NBKK-S7-EB01-102722-SO	10/27/2022 11:45 am	WATER	R0119 (NA)			

Shipment: **SHP-221110-02**

Status: Pending

Description: NBK Keyport

Range: E9772-E9774

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	E9772	NBKK-OU2A2-EB01-110722-SO	11/07/2022 10:55 am	AQ	R0119 (NA)			
2	E9774	NBKK-OU2A2-FB01-110822-SO	11/08/2022 10:30 am	AQ	R0119 (NA)			

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WORK/QUALITY ASSURANCE PROJECT PLAN

Shipment: **SHP-221111-04**

Status: Pending

Description: NBK Keyport

Range: E9844-E9850

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	E9844	NBKK-LFEX-MW03-1122	11/10/2022 11:30 am	WATER	R0119 (NA)			
2	E9845	NBKK-B1006-MW02-1122	11/09/2022 11:50 am	WATER	R0119 (NA)			
3	E9846	NBKK-LFEX-MW02-1122	11/10/2022 12:30 pm	WATER	R0119 (NA)			
4	E9847	NBKK-LFEX-MW04-1122	11/10/2022 10:05 am	WATER	R0119 (NA)			
5	E9848	NBKK-LFEX-MW01-1122	11/10/2022 9:20 am	WATER	R0119 (NA)			
6	E9849	NBKK-B1006-MW01-1122	11/09/2022 10:40 am	WATER	R0119 (NA)			
7	E9850	NBKK-B1006-MW03-1122	11/09/2022 1:20 pm	WATER	R0119 (NA)			

Shipment: **SHP-221115-01**

Status: Pending

Description: NBK KEYPORT

Range: D0005-D0012

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	D0005	NBKK-B76-EB01-111122-GW	11/11/2022 2:40 pm	AQ	R0119 (NA)			
2	D0006	NBKK-CF1-MW02-1122	11/14/2022 11:00 am	AQ	R0119 (NA)			
3	D0007	NBKK-CF1-EB01-111122-GW	11/11/2022 12:00 am	AQ	R0119 (NA)			
4	D0008	NBKK-B76-MW01-1122	11/11/2022 9:50 am	AQ	R0119 (NA)			
5	D0009	NBKK-B76-MW02-1122	11/11/2022 10:55 am	AQ	R0119 (NA)			
6	D0010	NBKK-CF1-MW03-1122	11/11/2022 2:20 pm	AQ	R0119 (NA)			
7	D0011	NBKK-B76-MW04-1122	11/10/2022 2:35 pm	AQ	R0119 (NA)			
8	D0012	NBKK-B76-MW03-1122	11/11/2022 11:50 am	AQ	R0119 (NA)			

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WORK/QUALITY ASSURANCE PROJECT PLAN

Attachment 2: Test Codes

Project Test Code Name:	Master_369D
SOP Reference:	5-369 - Analysis of Perfluoroalkyl Substances in Environmental Samples by Liquid Chromatography and Tandem Mass Spectrometry (LC-MS/MS)
Description:	PFAS by DoD QSM 5.3 Table B-15
Matrix:	L - Liquid Samples, like water or sea water, prepared and anlyzed under the same class of detection limits.
Detection Limit Study:	5-369
Instrument:	LC-MS/MS
MQO Criteria:	Universal_LC
Standard Report:	Standard Result Report

Method Specific Reporting				Holding Times (days)		Data Flags	
Result Units:	ng/L	***Unit Conversion:***	(none)	***Sample:***	14	***DL_Flag:***	U
Weight Basis:	LIQUID	***Result Format:***	Fixed Digits	***Frozen:***	14	***RL_Flag:***	J
Standard Basis:	SIS	***# of Figures/Digits:***	2	***Extract:***	28	***PB_Flag:***	B
Oil Weight Basis:	No	***Oil Weight Source:***	Oil Weight			***DIL_Flag:***	D
U-Value Substition:	U-Flag=MD	***Histograms:***	No			***HT_Flag:***	T
ECD_Reporting:	No						

No:	Analyte:	Report Name:	Type	RIS	SIS	Hidden:	Graph:
1	Perfluoro-n-hexanoic acid	PFHxA	T		13C5-PFHxA	No	No
2	Perfluoro-n-heptanoic Acid	PFHpA	T		13C4-PFHpA	No	No
3	Perfluoro-n-octanoic Acid	PFOA	T		13C8-PFOA	No	No
4	Perfluorononanoic Acid	PFNA	T		13C9-PFNA	No	No
5	Perfluoro-n-decanoic Acid	PFDA	T		13C6-PFDA	No	No
6	Perfluoro-n-undecanoic acid	PFUnA	T		13C7-PFUnA	No	No
7	Perfluoro-n-dodecanoic acid	PFDoA	T		13C2-PFDoA	No	No
8	Perfluoro-n-tridecanoic acid	PFTrDA	T		13C2-PFTeDA	No	No
9	Perfluoro-n-tetradecanoic acid	PFTeDA	T		13C2-PFTeDA	No	No
10	N-methylperfluoro-1-octanesulfonamidoacetic acid	NMeFOSAA	T		d3-MeFOSAA	No	No
11	N-ethylperfluoro-octanesulfonamidoacetic acid	NEtFOSAA	T		d5-EtFOSAA	No	No
12	Perfluoro-1-butanesulfonate	PFBS	T		13C3-PFBS	No	No
13	Perfluoro-1-hexanesulfonate	PFHxS	T		13C3-PFHxS	No	No
14	Perfluoro-1-octanesulfonate	PFOS	T		13C8-PFOS	No	No
15	Hexafluoropropylene oxide dimer acid	HFPO-DA	T		13C3-HFPO-DA	No	No
16	Adona	Adona	T		13C8-PFOA	No	No
17	9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	9Cl-PF3ONS	T		13C8-PFOA	No	No

BATTELLE
It can be done

WORK/QUALITY ASSURANCE PROJECT PLAN

Attachment 2: Test Codes

Project Test Code Name: Master_369D

No:	Analyte:	Report Name:	Type	RIS	SIS	Hidden:	Graph:
18	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	11Cl-PF3OUdS	T		13C8-PFOA	No	No
1	13C5-PFHxA	13C5-PFHxA	SIS	13C2-PFOA		No	No
2	13C4-PFHpA	13C4-PFHpA	SIS	13C2-PFOA		No	No
3	13C8-PFOA	13C8-PFOA	SIS	13C2-PFOA		No	No
4	13C9-PFNA	13C9-PFNA	SIS	13C2-PFOA		No	No
5	13C6-PFDA	13C6-PFDA	SIS	13C2-PFDA		No	No
6	13C7-PFUnA	13C7-PFUnA	SIS	13C2-PFDA		No	No
7	13C2-PFDoA	13C2-PFDoA	SIS	13C2-PFDA		No	No
8	13C2-PFTeDA	13C2-PFTeDA	SIS	13C2-PFDA		No	No
9	d3-MeFOSAA	d3-MeFOSAA	SIS	13C4-PFOS		No	No
10	d5-EtFOSAA	d5-EtFOSAA	SIS	13C4-PFOS		No	No
11	13C3-PFBS	13C3-PFBS	SIS	13C4-PFOS		No	No
12	13C3-PFHxS	13C3-PFHxS	SIS	13C4-PFOS		No	No
13	13C8-PFOS	13C8-PFOS	SIS	13C4-PFOS		No	No
14	13C3-HFPO-DA	13C3-HFPO-DA	SIS	13C2-PFOA		No	No

Total Analytes: 32

Subtract Peaks:

None

Sum Peaks:

None

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WORK/QUALITY ASSURANCE PROJECT PLAN

Attachment 2: Test Codes

Project Test Code Name: Master_369D

ICAL Acceptance Criteria:

Curve Fit:	Limit Mean(%):	Mean Qual:	Limit Ind.:	Ind. Qual:	Min Points:	Points Qual:	Comments:
Linear	NA	NA	0.99	N	5	N	y = Bx + C
Quadratic	NA	NA	0.99	N	6	N	y = Ax^2 + Bx + C

Continuing Calibration Verification Criteria:

CCV Name: 5-369

Frequency Hrs:		Mean PD(%):		Individual PD(%):		RIS/SIS RT Window (min):		Area Limit Low(%):	Area Limit High(%):		Comment:
12	(N)	30	(N)	30	(N)	0.04	(N)	-50	100	(N)	NA

Independent Calibration Verification:

ICC Name: 5-369

Mean PD Limit(%):		Ind. PD Limit(%):		RIS/SIS Window Limit (Secs):		Area Limit High(%):	Area Limit Low(%):		Comment:
30	(N)	30	(N)	0.04	(N)	-50	100	(N)	NA

Mass Discrimination Criteria:

None

Degredation Check Criteria:

None

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WORK/QUALITY ASSURANCE PROJECT PLAN

Attachment 3: Method Quality Objectives

MQO Application:	***Universal_LC***		
MQO:	**Acceptance Criteria:**	**Qual:**	**Corrective Action:**
Procedural Blank	Samples must be greater than five times the blank concentration (>5xPB).	B	Review with Project Manager; re-analyze or justify results in project records.
PB Measurement Quality Objective	Organic results in the Procedural Blank are less than 1/2 times the LOQ (<1/2xLOQ)	N	Review with Project Manager; re-analyze or justify results in project records.
Laboratory Control Sample	Recovery values 70-130%.	N	Review with project manager; re-analyze or justify reporting the results in project records.
Matrix Spike / Matrix Spike Duplicate Recovery	Organics 70-130%. Analyte concentration in MS/MSD must be greater than five times reported background concentration.	N	Review with Project Manager; re-analyze or justify reporting results in the project records.
	Organics Results in the Target is less than 5 times the Original	n	
Matrix Spike/Spike Duplicate Precision	Organics results less than 30% Relative Percent Difference (RPD). Analyte concentration in MS/MSD must be greater than five times reported background concentration.	N	Review with Project Manager; re-analyze or justify reporting results in the project records.
	Organics Results in the Target is less than 5 times the Original	n	
Standard Reference Material Accuracy	Organics Percent Difference less than 30% from a range of certified values on average. Analyte concentration must be greater than five times the Method Detection Limit (>5xMDL).	N	Review with Project Manager; re-analyze or justify reporting results in the project records.
	Organics Results in the Target is less than 5 times the MDL	n	
Analytical Duplicate Precision	Organics results less than 30% Relative Percent Difference (RPD). Analyte concentration must be > 5x MDL.	N	Review with Project Manager; re-analyze or justify reporting results in the project records.
	Organics Results in the Original is less than 5 times the MDL	n	

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WORK/QUALITY ASSURANCE PROJECT PLAN

Attachment 3: Method Quality Objectives

MQO Application:	*Universal_LC*		
MQO:	**Acceptance Criteria:**	**Qual:**	**Corrective Action:**
Analytical Triplicate Precision	Organics results less than 30% Relative Standard Deviation (RSD). Analyte concentration must be > 5x MDL. Organics Results in the Original is less than 5 times the MDL	N n	Review with Project Manager; re-analyze or justify reporting results in the project records.
Surrogate Compound Recovery	Recovery results between 50% and 150%.	N	Review with Project Manager; re-analyze or justify reporting results in the project records.
Control Oil	RPD < 30% for at least 90% of analytes	N	Results examined by project manager, task leader, or subcontractor lab manager. Reextraction, reanalysis, or justification documented.
Instrument Calibration	5-369-9: R-squared greater than or equal to 0.990		Results examined by project manager, task leader, or subcontractor lab manager. Reextraction, reanalysis, or justification documented.
Independent Calibration Check Solution	5-369-9: Individual PD less than or equal to 30%. Mean Percent Difference less than or equal to 30%.	N	Review with Project Manager; re-analyze or justify in project records.
Continuing Calibration Verification	5-369-9: Individual PD less than or equal to 30%. Mean Percent Difference less than or equal to 30%.	N	Review with Project Manager; re-analyze or justify in project records.

BATTELLE
It can be done

ShpNo SHP-221031-02

Battelle Project No: 026.000001

Sample Receipt Form

Approved: ☐ Authorized ☐

Project Number: 704758CH **Client:** Jacobs

Received by: Schumitz, Matt **Date/Time Received:** Saturday, October 29, 2022 12:00 PM

No. of Shipping Containers: 1

SHIPMENT

Method of Delivery: Commercial Carrier **Tracking Number:** Fed Ex

COC Forms: ☑ Shipped with samples ☐ No Forms

Cooler(s)/Box(es)

Cntr	Type	Tracking No.	Seal	Seal	Container	Therm.	Temp C	Smps
1 of 1	Cooler	2797 1861 4610	Custody Seals	Intact	Intact	Therm_1	2.5	10

Samples

Sample Labels:
☑ Sample labels agree with COC forms
☐ Discrepancies (see Sample Custody Corrective Action Form)

Container Seals:
☐ Tape ☐ Custody Seals ☐ Other Seals (See sample Log)
☑ Seals intact for each shipping container
☐ Seals broken (See sample log for impacted samples)

Condition of Samples:
☑ Sample containers intact
☐ Sample containers broken/leaking (See Custody Corrective Action Form)

Temperature upon receipt (°C): 2.5 Temperature Blank used ☑ Yes ☐ No
(Note: If temperature upon receipt differs from required conditions, see sample log comment field)

Samples Acidified: ☐ Yes ☐ No ☑ Unknown

Initial pH 5-9?: ☐ Yes ☐ No ☑ NA
If no, individual sample adjustments on the Auxiliary Sample Receipt Form

Total Residual Chlorine Present?: ☐ Yes ☐ No ☑ NA
If yes, individual sample adjustments on the Auxiliary Sample Receipt Form

Head Space <1% in samples for water VOC analysis: ☐ Yes ☐ No ☑ NA
Individual sample deviations noted on sample log

Samples Containers:
Samples returned in PC-grade jars: ☐ Yes ☐ No ☑ Unknown /Lot No.: UnKnown

Storage Location: Custody: Refrigerator - R0119 (NA) **BDO IDs Assigned:** E9337 - E9346

Samples logged in by: Schumitz, Matt **Date/Time:** 10/29/2022 12:00 PM

Approved By: **Approved On:**

Authorized By: **Authorized On:**

BATTELLE
It can be done

ShpNo: SHP-221031-02

Battelle Project No: 026.000001

Report Corrective Actions

Corrective Action No: 1 **of** 1

Authorized ☐ Approved: ☐

COC Client: Jacobs
COC Project: PNW PFAS SI NBK Keyport
COC Date: 10/31/2022 11:0

	Description of Problem:	Explanation:
Client Id	Other	The ID and collection date do not match for sample E9337 COC reads NBKK-IDW01-SO-102722 with a date of 10/27/22 but the sample container reads NBKK-IDW01-SO-102622 with a date of 10/26/22

Documentation of project manager notification

Sample Custodian Schumitz, Matt **Date:** 10/31/2022 2:19:00 P
Laboratory Manager: Thorn, Jonathan **Date:** 11/1/2022 9:47:00 AM
Project Manager: Thorn, Jonathan **Date:** 11/1/2022 9:47:00 AM

Documentation of client notification (should be completed by project manager within 24 hrs):

On 31-Oct-22 **I contacted** Acaron, Juan **at** CH2M

Results of communication with client (Describe any corrective action directed by the client):

see email

Date this form was received back to the custodian:
Reference Number:

From: Shiroodi, Kim
To: Schumitz, Matt (US); Acaron, Juan
Cc: Thorn, Jonathan (US); Lizotte Jr, Robert (US); Davis, Tiffany; Camus, Seng
Subject: RE: CTO-4117 BNC, MFD, Keyport 10/31/22
Date: Tuesday, November 1, 2022 9:26:07 AM
Attachments: image001.png

[Message received from outside the Battelle network. Carefully examine it before you open any links or attachments]

Please label the sample to match the chain with a date of 102722. Thanks!

Kim Shiroodi | Jacobs [jacobs.com] | Project Chemist
O:+1.773.693.3809 | M:+1.630.506.1247 | kim.shiroodi@jacobs.com
8735 West Higgins Road, Suite 400 | Chicago, IL 60631 | US

From: Schumitz, Matt (US) <SCHUMITZM@battelle.org>
Sent: Monday, October 31, 2022 3:31 PM
To: Acaron, Juan <Juan.Acaron@jacobs.com>
Cc: Thorn, Jonathan R <thorn@battelle.org>; Lizotte Jr, Robert (US) <lizotte@battelle.org>; Davis, Tiffany <tiffany.davis1@jacobs.com>; Camus, Seng <Seng.Camus@jacobs.com>; Shiroodi, Kim <Kim.Shiroodi@jacobs.com>
Subject: [EXTERNAL] CTO-4117 BNC, MFD, Keyport 10/31/22

Hello All

The attached custody records are for the samples received on Saturday all in good condition.

1 small discrepancy on the Keyport shipment that will need to be addressed

The ID and collection date do not match for sample E9337
COC reads NBKK-IDW01-SO-102722 with a date of 10/27/22 but the sample container reads NBKK-IDW01-SO-102622 with a date of 10/26/22

Results will be reported as follows:

SDG	Matrix	Due date	

22-1941	Water	12/2/22 (28-day TAT)	BNC
22-1943	Solids	12/2/22 (28-day TAT)	Keyport IDW
22-1944	Solids	12/2/22 (28-day TAT)	Keyport
22-1945	Water	12/2/22 (28-day TAT)	Keyport IDW
22-1946	Water	12/2/22 (28-day TAT)	Keyport
22-1947	Solid	12/2/22 (28-day TAT)	MFD
22-1948	Solid	12/2/22 (28-day TAT)	MFD

Thanks Matt

Matthew Schumitz
Technician Specialist / Sample Custodian
Hazardous Waste Coordinator
Analytical Chemistry Services
Office: 781.681.5588
schumitzm@battelle.org

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ShpNo SHP-221031-02

Battelle Project No: 026.000001

Sample Receipt Form Details

Approved: ☐ Authorized ☐

Project Number: 704758CH **Client:** Jacobs

Received by: Schumitz, Matt **Date/Time Received:** Saturday, October 29, 2022 12:00 PM

No. of Shipping Containers: 1

BDO Id:	Client Sample ID:	Collection Date:	Login Date:	Ctrs:	Matrix:	Temp:	pH:	TRC:	VOC:	Stored In:	Loc:	No:	Comments:
E9337	NBKK-IDW01-SO-102722	10/27/22 13:00	10/31/22 11:08	1	SOIL	2.5	NA	NA	NA	R0119 (NA)			
E9338	NBKK-IDW02-SO-102722	10/27/22 13:45	10/31/22 11:08	1	SOIL	2.5	NA	NA	NA	R0119 (NA)			
E9339	NBKK-IDW03-SO-102722	10/27/22 14:15	10/31/22 11:08	1	SOIL	2.5	NA	NA	NA	R0119 (NA)			
E9340	NBKK-IDW04-AQ-102722	10/27/22 15:00	10/31/22 11:09	2	WATER	2.5	NA	NA	NA	R0119 (NA)			
E9341	NBKK-S7-SS02-0001	10/27/22 11:25	10/31/22 11:09	1	SOIL	2.5	NA	NA	NA	R0119 (NA)			
E9342	NBKK-S7-SS02-0001 MS	10/27/22 11:25	10/31/22 11:10	1	SOIL	2.5	NA	NA	NA	R0119 (NA)			
E9343	NBKK-S7-SS02-0001 MSD	10/27/22 11:25	10/31/22 11:10	1	SOIL	2.5	NA	NA	NA	R0119 (NA)			
E9344	NBKK-S7-EB01-102722-SO	10/27/22 11:45	10/31/22 11:10	2	WATER	2.5	NA	NA	NA	R0119 (NA)			
E9345	NBKK-S7-SB02-1011	10/27/22 15:15	10/31/22 11:11	1	SOIL	2.5	NA	NA	NA	R0119 (NA)			
E9346	NBKK-S7-SS01-0102	10/28/22 10:00	10/31/22 11:11	1	SOIL	2.5	NA	NA	NA	R0119 (NA)			

Total Samples: 10

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Chain of Custody

Project Name: PNW PFAS SI NBK-Keyport	Client Project Manager: Dennis Bullam	Client Project Number: 704758CH	COC Number:
Deliver Results to: Juan Acaron	Samples Collected by: Ilka Dinkelman		Turnaround Time[2]: ☐ 28-days (standard) ☐ 21-days (Rush) ☐ 14-days (Rush) ☐ 7-days (Rush) ☐ 3-day (Rush)
Address:	Phone: 775-336-9176		
	Email: ilka.dinkelman@jacobs.com		
Phone: 352-384-7002	Time Zone:		
Email: Juan.acaron@jacobs.com	PO reference:		

Sample ID	Date	Time	Type[3]	Matrix	Count	Lab ID	Test / Preservative[1]: PFAS	Sample Comments
NBKK-IDW01-SO-102722	10/27	1300		Soil	1	E9337	1	
NBKK-IDW02-SO-102722	10/27	1345		Soil	1	E9338	1	
NBKK-IDW03-SO-102722	10/27	1415		Soil	1	E9339	1	
NBKK-IDW04-AQ-102722	10/27	1500		Water	2	E9340	2	

Relinquished by (Print/Sign):	Company:	Date/Time:	Received by (Print/Sign):	Company:	Date/Time:
Griffin Riley	Jacobs	10/28 1300		BNO	10/29/22 1200
Relinquished by (Print/Sign):	Company:	Date/Time:	Received by (Print/Sign):	Company:	Date/Time:
Relinquished by (Print/Sign):	Company:	Date/Time:	Received by (Print/Sign):	Company:	Date/Time:

Field Project comments:	Receipt comments:

[1] include comments in the Field Project comment field if there are method specific requirements, i.e., "WHO PCB Congener list", "PFAS – 18 analytes", or "PFAS – 29 analytes from UCMR5"

[2] Rush TAT request should be verified with the lab prior to submitting samples

[3] Client sample type, if applicable

BATTELLE

Chain of Custody

Project Name: PNW PFAS SI NBK-Inspect	Client Project Manager: Dennis Ballam	Client Project Number: 704758CH	COC Number:
Deliver Results to: Juan Acaron	Samples Collected by: Ilka Dinkelman		Test / Preservative[1]
Address:	Phone: 775-336-9176		Turnaround Time[2]: ☐ 28-days (standard) ☐ 21-days (Rush) ☐ 14-days (Rush) ☐ 7-days (Rush) ☐ 3-day (Rush)
	Email: ilka.dinkelman@jacobs.com		
Phone: 352-384-7002	Time Zone:		
Email: Juan.acaron@jacobs.com	PO reference:		

Sample ID	Date	Time	Type[3]	Matrix	Count	Lab ID	PFAS	Sample Comments
NBKK-57-SS02-0001	10/27	11:25		Soil	1	E9341	1	
NBKK-57-SS02-0001MS	10/27	11:25		Soil	1	E9342	1	
NBKK-57-SS02-0001MSD	10/27	11:25		Soil	1	E9343	1	
NBKK-57-EB01-102722-SO	10/27	11:45		Water	2	E9344	2	
NBKK-57-SB02-1011	10/27	15:15		Soil	1	E9345	1	
NBKK-57-SS01-0102	10/28	10:00		Soil	1	E9346	1	

Relinquished by (Print/Sign):	Company:	Date/Time:	Received by (Print/Sign):	Company:	Date/Time:
Griffin Riley	Jacobs	10/28 1300		BNO	10/29/22 1200
Relinquished by (Print/Sign):	Company:	Date/Time:	Received by (Print/Sign):	Company:	Date/Time:
Relinquished by (Print/Sign):	Company:	Date/Time:	Received by (Print/Sign):	Company:	Date/Time:

Field Project comments:	Receipt comments:

[1] include comments in the Field Project comment field if there are method specific requirements, i.e., "WHO PCB Congener list", "PFAS – 18 analytes", or "PFAS – 29 analytes from UCMR5"

[2] Rush TAT request should be verified with the lab prior to submitting samples

[3] Client sample type, if applicable

ORIGIN ID:PWTA (503) 410-1217
JACOBS
5701 CLEVELAND ST STE 200
VIRGINIA BEACH, VA 23462
UNITED STATES US

SHIP DATE: 28OCT22
ACTWGT: 47.45 LB
CAD: 6992271/SSF02341
DIMS: 24x13x14 IN
BILL THIRD PARTY

TO MATT SCHUMITZ
BATTELLE ANALYTICAL SERVICES
1125 SOMERSET AVE

2.5 °C
Therm1

TAUNTON MA 02780
(000) 000-0000
INV:
PO:
REF:
DEPT:

FedEx Express

TRK# 0201 2797 1861 4610

SATURDAY 12:00P
PRIORITY OVERNIGHT

XO UWAA

AHS RES
02780
MA-US BOS

Part # 156297-[illegible] REV 09/23

Data Tables

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It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-IDW04-AQ-102722
Battelle ID	E9340-FS
Sample Type	SA
Collection Date	10/27/2022
Extraction Date	11/07/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	NA
Matrix	WATER
Sample Size	0.289
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	2.16 U	E9340-FS(0)	1.000	11/30/2022	0.790	2.16	4.33
PFHpA	375-85-9	2.16 U	E9340-FS(0)	1.000	11/30/2022	0.814	2.16	4.33
PFOA	335-67-1	1.04 J	E9340-FS(0)	1.000	11/30/2022	0.874	2.16	4.33
PFNA	375-95-1	2.16 U	E9340-FS(0)	1.000	11/30/2022	0.721	2.16	4.33
PFDA	335-76-2	2.16 U	E9340-FS(0)	1.000	11/30/2022	0.678	2.16	4.33
PFUnA	2058-94-8	2.16 U	E9340-FS(0)	1.000	11/30/2022	0.651	2.16	4.33
PFDoA	307-55-1	2.16 U	E9340-FS(0)	1.000	11/30/2022	0.657	2.16	4.33
PFTrDA	72629-94-8	2.16 U	E9340-FS(0)	1.000	11/30/2022	0.642	2.16	4.33
PFTeDA	376-06-7	2.16 U	E9340-FS(0)	1.000	11/30/2022	0.684	2.16	4.33
NMeFOSAA	2355-31-9	2.16 U	E9340-FS(0)	1.000	11/30/2022	0.891	2.16	4.33
NEtFOSAA	2991-50-6	2.16 U	E9340-FS(0)	1.000	11/30/2022	0.856	2.16	4.33
PFBS	375-73-5	2.16 U	E9340-FS(0)	1.000	11/30/2022	0.749	2.16	4.33
PFHxS	355-46-4	2.16 U	E9340-FS(0)	1.000	11/30/2022	0.862	2.16	4.33
PFOS	1763-23-1	22.9	E9340-FS(0)	1.000	11/30/2022	0.926	2.16	4.33
HFPO-DA	13252-13-6	2.16 U	E9340-FS(0)	1.000	11/30/2022	0.748	2.16	4.33
Adona	919005-14-4	2.16 U	E9340-FS(0)	1.000	11/30/2022	0.752	2.16	4.33
9Cl-PF3ONS	756426-58-1	2.16 U	E9340-FS(0)	1.000	11/30/2022	0.891	2.16	4.33
11Cl-PF3OUdS	763051-92-9	2.16 U	E9340-FS(0)	1.000	11/30/2022	0.779	2.16	4.33

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It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-IDW04-AQ-102722
Battelle ID	E9340-FS
Sample Type	SA
Collection Date	10/27/2022
Extraction Date	11/07/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS

Surrogate Recoveries (%)	Recovery	Extract ID	Analysis Date
13C5-PFHxA	59	E9340-FS(0)	11/30/2022
13C4-PFHpA	66	E9340-FS(0)	11/30/2022
13C8-PFOA	79	E9340-FS(0)	11/30/2022
13C9-PFNA	70	E9340-FS(0)	11/30/2022
13C6-PFDA	75	E9340-FS(0)	11/30/2022
13C7-PFUnA	71	E9340-FS(0)	11/30/2022
13C2-PFDoA	69	E9340-FS(0)	11/30/2022
13C2-PFTeDA	55	E9340-FS(0)	11/30/2022
d3-MeFOSAA	76	E9340-FS(0)	11/30/2022
d5-EtFOSAA	72	E9340-FS(0)	11/30/2022
13C3-PFBS	66	E9340-FS(0)	11/30/2022
13C3-PFHxS	83	E9340-FS(0)	11/30/2022
13C8-PFOS	70	E9340-FS(0)	11/30/2022
13C3-HFPO-DA	70	E9340-FS(0)	11/30/2022

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It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	LT96 IB
Battelle ID	LT96 IB_11/29/2022
Sample Type	IB
Collection Date	NA
Extraction Date	NA
Analysis Date	11/29/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	NA
Matrix	Water
Sample Size	0.250
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	DL	LOD	LOQ
PFHxA	307-24-4	2.50 U	0.913	2.50	5.00
PFHpA	375-85-9	2.50 U	0.941	2.50	5.00
PFOA	335-67-1	2.50 U	1.01	2.50	5.00
PFNA	375-95-1	2.50 U	0.833	2.50	5.00
PFDA	335-76-2	2.50 U	0.784	2.50	5.00
PFUnA	2058-94-8	2.50 U	0.752	2.50	5.00
PFDoA	307-55-1	2.50 U	0.760	2.50	5.00
PFTrDA	72629-94-8	2.50 U	0.742	2.50	5.00
PFTeDA	376-06-7	2.50 U	0.791	2.50	5.00
NMeFOSAA	2355-31-9	2.50 U	1.03	2.50	5.00
NEtFOSAA	2991-50-6	2.50 U	0.990	2.50	5.00
PFBS	375-73-5	2.50 U	0.866	2.50	5.00
PFHxS	355-46-4	2.50 U	0.997	2.50	5.00
PFOS	1763-23-1	2.50 U	1.07	2.50	5.00
HFPO-DA	13252-13-6	2.50 U	0.865	2.50	5.00
Adona	919005-14-4	2.50 U	0.869	2.50	5.00
9Cl-PF3ONS	756426-58-1	2.50 U	1.03	2.50	5.00
11Cl-PF3OUdS	763051-92-9	2.50 U	0.901	2.50	5.00

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	LT96 IB
Battelle ID	LT96 IB_11/29/2022
Sample Type	IB
Collection Date	NA
Extraction Date	NA
Analysis Date	11/29/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	NA
Matrix	Water
Sample Size	0.250
Size Unit-Basis	L

Surrogate Recoveries (%)

13C5-PFHxA	93
13C4-PFHpA	97
13C8-PFOA	94
13C9-PFNA	92
13C6-PFDA	96
13C7-PFUnA	98
13C2-PFDoA	90
13C2-PFTeDA	91
d3-MeFOSAA	104
d5-EtFOSAA	95
13C3-PFBS	98
13C3-PFHxS	96
13C8-PFOS	99
13C3-HFPO-DA	94

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	Procedural Blank
Battelle ID	DK856PB-FS
Sample Type	PB
Collection Date	11/07/2022
Extraction Date	11/07/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	NA
Matrix	WATER
Sample Size	0.254
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	2.46 U	DK856PB-FS(0)	1.000	11/30/2022	0.899	2.46	4.92
PFHpA	375-85-9	2.46 U	DK856PB-FS(0)	1.000	11/30/2022	0.926	2.46	4.92
PFOA	335-67-1	2.46 U	DK856PB-FS(0)	1.000	11/30/2022	0.994	2.46	4.92
PFNA	375-95-1	2.46 U	DK856PB-FS(0)	1.000	11/30/2022	0.820	2.46	4.92
PFDA	335-76-2	2.46 U	DK856PB-FS(0)	1.000	11/30/2022	0.772	2.46	4.92
PFUnA	2058-94-8	2.46 U	DK856PB-FS(0)	1.000	11/30/2022	0.740	2.46	4.92
PFDoA	307-55-1	2.46 U	DK856PB-FS(0)	1.000	11/30/2022	0.748	2.46	4.92
PFTrDA	72629-94-8	2.46 U	DK856PB-FS(0)	1.000	11/30/2022	0.730	2.46	4.92
PFTeDA	376-06-7	2.46 U	DK856PB-FS(0)	1.000	11/30/2022	0.779	2.46	4.92
NMeFOSAA	2355-31-9	2.46 U	DK856PB-FS(0)	1.000	11/30/2022	1.01	2.46	4.92
NEtFOSAA	2991-50-6	2.46 U	DK856PB-FS(0)	1.000	11/30/2022	0.974	2.46	4.92
PFBS	375-73-5	2.46 U	DK856PB-FS(0)	1.000	11/30/2022	0.852	2.46	4.92
PFHxS	355-46-4	2.46 U	DK856PB-FS(0)	1.000	11/30/2022	0.981	2.46	4.92
PFOS	1763-23-1	2.46 U	DK856PB-FS(0)	1.000	11/30/2022	1.05	2.46	4.92
HFPO-DA	13252-13-6	2.46 U	DK856PB-FS(0)	1.000	11/30/2022	0.851	2.46	4.92
Adona	919005-14-4	2.46 U	DK856PB-FS(0)	1.000	11/30/2022	0.855	2.46	4.92
9Cl-PF3ONS	756426-58-1	2.46 U	DK856PB-FS(0)	1.000	11/30/2022	1.01	2.46	4.92
11Cl-PF3OUdS	763051-92-9	2.46 U	DK856PB-FS(0)	1.000	11/30/2022	0.887	2.46	4.92

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	Procedural Blank
Battelle ID	DK856PB-FS
Sample Type	PB
Collection Date	11/07/2022
Extraction Date	11/07/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS

Surrogate Recoveries (%)	**Recovery**	**Extract ID**	**Analysis Date**
13C5-PFHxA	81	DK856PB-FS(0)	11/30/2022
13C4-PFHpA	73	DK856PB-FS(0)	11/30/2022
13C8-PFOA	87	DK856PB-FS(0)	11/30/2022
13C9-PFNA	85	DK856PB-FS(0)	11/30/2022
13C6-PFDA	93	DK856PB-FS(0)	11/30/2022
13C7-PFUnA	85	DK856PB-FS(0)	11/30/2022
13C2-PFDoA	76	DK856PB-FS(0)	11/30/2022
13C2-PFTeDA	91	DK856PB-FS(0)	11/30/2022
d3-MeFOSAA	82	DK856PB-FS(0)	11/30/2022
d5-EtFOSAA	70	DK856PB-FS(0)	11/30/2022
13C3-PFBS	70	DK856PB-FS(0)	11/30/2022
13C3-PFHxS	78	DK856PB-FS(0)	11/30/2022
13C8-PFOS	86	DK856PB-FS(0)	11/30/2022
13C3-HFPO-DA	82	DK856PB-FS(0)	11/30/2022

BATTELLE
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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	Laboratory Control Sample
Battelle ID	DK857LCS-FS
Sample Type	LCS
Collection Date	11/07/2022
Extraction Date	11/07/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS
% Moisture	NA
Matrix	WATER
Sample Size	0.261
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	Target	Recovery	Qual	Control Limits Lower	Control Limits Upper
PFHxA	307-24-4	165	DK857LCS-FS(0)	1.000	11/30/2022	153	108		72	129
PFHpA	375-85-9	178	DK857LCS-FS(0)	1.000	11/30/2022	153	116		72	130
PFOA	335-67-1	192	DK857LCS-FS(0)	1.000	11/30/2022	153	125		71	133
PFNA	375-95-1	192	DK857LCS-FS(0)	1.000	11/30/2022	153	125		69	130
PFDA	335-76-2	197	DK857LCS-FS(0)	1.000	11/30/2022	153	129		71	129
PFUnA	2058-94-8	199	DK857LCS-FS(0)	1.000	11/30/2022	153	130		69	133
PFDoA	307-55-1	200	DK857LCS-FS(0)	1.000	11/30/2022	153	131		72	134
PFTrDA	72629-94-8	182	DK857LCS-FS(0)	1.000	11/30/2022	153	119		65	144
PFTeDA	376-06-7	171	DK857LCS-FS(0)	1.000	11/30/2022	153	112		71	132
NMeFOSAA	2355-31-9	179	DK857LCS-FS(0)	1.000	11/30/2022	153	117		65	136
NEtFOSAA	2991-50-6	182	DK857LCS-FS(0)	1.000	11/30/2022	153	119		61	135
PFBS	375-73-5	168	DK857LCS-FS(0)	1.000	11/30/2022	153	110		72	130
PFHxS	355-46-4	166	DK857LCS-FS(0)	1.000	11/30/2022	153	108		68	131
PFOS	1763-23-1	197	DK857LCS-FS(0)	1.000	11/30/2022	153	129		65	140
HFPO-DA	13252-13-6	166	DK857LCS-FS(0)	1.000	11/30/2022	153	108		60	126
Adona	919005-14-4	168	DK857LCS-FS(0)	1.000	11/30/2022	153	110		61	130
9Cl-PF3ONS	756426-58-1	181	DK857LCS-FS(0)	1.000	11/30/2022	153	118		60	126
11Cl-PF3OUdS	763051-92-9	152	DK857LCS-FS(0)	1.000	11/30/2022	153	99		56	125

BATTELLE
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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	Laboratory Control Sample
Battelle ID	DK857LCS-FS
Sample Type	LCS
Collection Date	11/07/2022
Extraction Date	11/07/2022
Analytical Instrument	Sciex 6500+ (AE) LC/MS/MS

Surrogate Recoveries (%)	**Recovery**	**Extract ID**	**Analysis Date**
13C5-PFHxA	82	DK857LCS-FS(0)	11/30/2022
13C4-PFHpA	75	DK857LCS-FS(0)	11/30/2022
13C8-PFOA	89	DK857LCS-FS(0)	11/30/2022
13C9-PFNA	86	DK857LCS-FS(0)	11/30/2022
13C6-PFDA	96	DK857LCS-FS(0)	11/30/2022
13C7-PFUnA	92	DK857LCS-FS(0)	11/30/2022
13C2-PFDoA	80	DK857LCS-FS(0)	11/30/2022
13C2-PFTeDA	99	DK857LCS-FS(0)	11/30/2022
d3-MeFOSAA	78	DK857LCS-FS(0)	11/30/2022
d5-EtFOSAA	69	DK857LCS-FS(0)	11/30/2022
13C3-PFBS	69	DK857LCS-FS(0)	11/30/2022
13C3-PFHxS	81	DK857LCS-FS(0)	11/30/2022
13C8-PFOS	84	DK857LCS-FS(0)	11/30/2022
13C3-HFPO-DA	79	DK857LCS-FS(0)	11/30/2022

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Glossary of Data Qualifiers

Flag:	Application:
B	Analyte found in the sample at a concentration <10x the level found in the procedural blank
D	Dilution Run. Initial run outside the initial calibration range of the instrument
E	Estimate, result is greater than the highest concentration level in the calibration
J	Analyte detected below the Limit of Quantitation (LOQ)
MI	Significant Matrix Interference - value could not be determined.
N	Quality Control (QC) value is outside the accuracy or precision Data Quality Objective (DQO)
NA	Not Applicable
T	Holding Time (HT) exceeded
U	Analyte not detected or detected below the Detection Limit (DL) value, Limit of Detection (LOD) reported
Q	Ion ratio outside of criteria (50% difference from calibration expected ratio)

CTO-4117: Northwest PFAS Investigation
Project No G25161.X1.XX.0026.000001
PFAS by DoD QSM 5.3 Table B-15

SOIL

Batch 22-2094

Package DP-22-2163

Submitted to:
CH2M
5701 Cleveland Street
Virginia Beach, VA 23462 USA

Submitted by:
Battelle Norwell Operations
141 Longwater Drive Suite 202
Norwell, MA 02061

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CTO-4117: Northwest PFAS Investigation
Project No G25161.X1.XX.0026.000001
PFAS by DoD QSM 5.3 Table B-15

SOIL

Batch 22-2094

Package DP-22-2163

Submitted to:
CH2M
5701 Cleveland Street
Virginia Beach, VA 23462 USA

NELAP Accreditation Number: E87856 (Florida Department of Health)
DoD-ELAP Accreditation Number: 91667

Submitted by:
Battelle Norwell Operations
141 Longwater Drive Suite 202
Norwell, MA 02061

Analyst Approval: Vincent Urso 2022.12.27 13:09:26 -05'00'

QC Chemist Approval: Deb Huntress 2022.12.29 14:33:07 -05'00'

Project Manager Approval: Robert Lizotte, Jr. 2022.12.29 14:37:36 -05'00'

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CTO-4117: Northwest PFAS Investigation
Project No G25161.X1.XX.0026.000001
PFAS by DoD QSM 5.3 Table B-15

SOIL

Batch 22-2094

Package DP-22-2163

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BATTELLE

Master Signature Page

Name (Printed)	Signature	Initials	Date
Jonathan Thorn		JRT	1/9/2020
Robert Lizotte, Jr.		BL	1.9.2020
Elyn M Fitch		EMF	1/9/2020
Carla Devine		CRD	1/9/2020
Denise Schumitz		DS	1/9/2020
Lauren Griffith		LMG	1.9.2020
Carrie P McCarthy		CPM	1/9/2020
Rich Restuccia		RR	1/9/2020
Sam Guimaraes		SAG	1/9/2020
Jordan Tower		JLT	1/9/2020
Christie Usher		CU	1/9/2020
Kevin McInerney		KM	1/14/2020
Matt Schumitz		MDS	1/14/2020
Weidong Li		W.L	1/14/2020
Kayla Lamarre		KAL	1/14/2020
MUNAZ MUNTASIR		MM	01/14/2020
Kristen Nichols		KN	01/14/2020
Kelsey Harnden		KH	01/30/2020
Kevin Bailey		KB	1/30/2020
Stephanie Schultz		SAS	1/30/2020

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Master Signature Page

Name (Printed)	Signature	Initials	Date
Clinicea Brown		CB	01/30/20
Ryan Kelly		RK	01/30/20
KAREN HYPPOLITE		K.H.	01/31/20
Gail DeRuzzo		GD	01/31/2020
Tracy Stenner			1/31/2020
Ashley Wellington		AW	1131/2020
Daniel Cooney		DAC	1/31/2020
Peter Demers		PD	1/31/2020
Andy Delmar		AD	3/19/2021
Emily Reardon		ER	3/19/2021
Brenton Murphy		Bm	3/19/2021
Haley Hart		H H	3/19/21
Allison Wamaess		AW	3/19/21
Taylor Noonan		TN	3/19/21
FRANCO PALA		FP	3/19/21
Amina Chamanlal		AC	11/03/21
J Michelle Wentzell		MW	11-3-21
Zachary Dreiker		ZD	11/3/21
Drew Croke		DC	11/3/21
Zachary Willenberg		ZW	11/3/21

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Master Signature Page

Name (Printed)	Signature	Initials	Date
Hayley Beal	Hayley Beal	HB	5/9/2022
Nathaniel Kinsman	Nathaniel Kinsman	NK	5/9/2022
Debra Huntress	Debra Huntress	DHU	5/9/22
Vincent Urso	Vincent Urso	VU	5/9/22

Sample Summary

Client: CH2M (Jacobs)
SDG: 22-2094
Project/Site: NBK Keyport
CTO: 4117

Lab Sample ID	Client Sample ID	Matrix	Collection Date	Receipt Date
D0215-FS	NBKK-IDW05-SO-111522	SOIL	11/15/2022	11/17/2022
D0216-FS	NBKK-IDW06-SO-111522	SOIL	11/15/2022	11/17/2022
D0217-FS	NBKK-IDW07-SO-111522	SOIL	11/15/2022	11/17/2022
D0218-FS	NBKK-IDW08-SO-111522	SOIL	11/15/2022	11/17/2022
D0219-FS	NBKK-IDW09-SO-111522	SOIL	11/15/2022	11/17/2022
D0220-FS	NBKK-IDW10-SO-111522	SOIL	11/15/2022	11/17/2022
DL188PB-FS	220520-01: Ottawa Sand	SOLID	11/28/2022	11/28/2022
DL189LCS-FS	220520-01: Ottawa Sand	SOLID	11/28/2022	11/28/2022

Work Plan

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WORK/QUALITY ASSURANCE PROJECT PLAN

1.0 GENERAL PROJECT INFORMATION

Project Title:	CTO-4117: NBK Keyport PFAS in Solids
Project Number:	G25161.X1.XX.0026.000001
Client:	CH2M 5701 Cleveland Street Suite 200 Virginia Beach, VA 23462 USA
Client Contact Information:	Juan Acaron Project Chemist (352) 331-8121(V) NA juan.acaron@jacobs.com
Effective Date of QAPP:	9/12/2022
Version Number:	G25161.X1.XX.0026.000001(S)-12
Project Manager:	Thorn, Jonathan
Laboratory Task Manager:	Thorn, Jonathan
Deliverable Due Date:	10/14/2022

2.0 SCOPE OF WORK

Overview:	PFAS in solid samples (18 analytes)
Matrix:	Soil/Sediment

2.1 TECHNICAL APPROACH

2.1.1 Sample Receipt, Storage, and Handling

The list of samples for this project plan are presented in Attachment 1.

Storage Directions:	Store refrigerated.
Sub_Sampling:	None
Procedures:	NA
Contact:	NA
Comment:	NA
Archiving:	Dispose of excess samples after six months.
Disposal:	Dispose of excess samples in the appropriate waste stream.

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WORK/QUALITY ASSURANCE PROJECT PLAN

2.1.2 Sample Preparation

NA

Samples Expected:	Samples Per Batch:	Batches Expected:
20	20	1

Batch quality control samples are defined in Table 1.

Target samples are presented in Attachment 1.

Table 1: Quality Control Samples

Type:	*Description:*	*Count:*	*Rgt:*	*Reference:*	*Comment:*
PB	Laboratory control reagent blank.	1 per batch	--	220520-01: Ottawa Sand Lot:2KA0342	
LCS	Laboratory Control Sample	1 per batch	Yes	220520-01: Ottawa Sand Lot:2KA0342	
MS	Spiked field sample for determining method accuracy in the presence of matrix.	1 per batch	--	NA	
MSD	Spiked field sample for determining method accuracy and precision in the presence of matrix.	1 per batch	--	NA	

2.1.3 Extraction/Preparation

2.1.3.1 Extraction

SOP No.-Rev: **5-370-13**

SOP Title: *Extraction of Poly and Perfluoroalkyl Substances from Environmental Matrices*

Sample Size: 5.00 g

SIS and LCS/MS Compounds: Defined in Table 2.

Deviations: None.

Comments: None.

Table 2: SIS and LCS/MS Spiking Level

Standard Type	Standard Contents		Spike Amount (ng)	Volume (uL)	Comment
PFAS DoD Surrogate (18 Targets)	LS23	SIS	~ 25.0 ng	50 uL	NA
PFAS DoD Second Source LCS/MS (18	LR93	LCS/MS	~ 50 ng	125 uL	Vary spike between 100 and 150 µL

Standard Type	Standard Contents	Spike Amount (ng)	Volume (uL)	Comment
Analytes)				

2.1.3.2 Cleanup

None.

RIS spiking levels are presented in Table 3.

Extract PIV (uL): 5000

Table 3: RIS Spiking Level

Standard Type	Standard Contents	Spike Amount (ng)	Volume (uL)	Comment
PFAS DoD Internal Standards	LS03 RIS	~ 25.0 ng	50 uL	NA

2.1.4 Instrumental Analysis

The list of analytes along with data quality criteria are presented in Attachment 2.

1) SOP_No-Rev: **5-369-09**

SOP_Title: *Analysis of Perfluoroalkyl Substances in Environmental Samples by Liquid Chromatography and Tandem Mass Spectrometry (LC-MS/MS)*

Deviations: None

Comments: None

2.2. DELIVERABLES

Deliverables Due:	10/14/2022
LIMS Reports:	*No*
Histograms:	*No*
Excel Tables:	*No*
EICs:	*No*
Chromatograms:	*No*
EDDs:	*No*
Comments:	• Individual data sets will be due 28 days after receipt of each sample set. • Select data sets have expedited TAT. • Full Level 4 data package (QSM 5.3 Table B-15 compliant) required.

- CH2M EDD required.
- WO 148003519

3.0 QUALITY

The Method Quality Objectives are defined in Attachment 3.

4.0 ORGANIZATION AND COMMUNICATION

4.1 ORGANIZATION

The project team is defined in Table 4. Supervisors may make substitutions with Project Manager concurrence.

Table 4: Project Team and Roles

Staff Member	Role	Comment
Jonathan R. Thorn	Project Manager	NA
Kelsey Harnden	Sample Preparation	NA
Denise M. Schumitz	LC-MS/MS Analysis	NA
Matt D. Schumitz	Sample Custody	NA
Carla R. Devine	Quality Control Officer	NA
Zachary J. Willenberg	Quality Assurance Officer	NA

4.2 COMMUNICATION

A kick-off meeting will be held to discuss project scope and goals.

5.0 SCHEDULE

The project schedule is presented in Table 5.

Table 5. Schedule of Laboratory Activities

Activity:	Start Date:	End Date:	TAT (days):	Comment:
Sample Receipt	09/12/2022	09/12/2022	0	NA
Sample Preparation	09/12/2022	09/30/2022	18	NA
Instrument Analysis	09/30/2022	10/13/2022	13	NA
Quality Control Review	10/13/2022	10/14/2022	1	NA
Quality Assurance Review	10/14/2022	10/14/2022	0	NA

6.0 BUDGET

The labor budget for the analytical task is presented in Table 6.

Table 6. Labor Budget (Laboratory Analytical Task)

Labor Activity:	Hours/ Batch:	Batches:	Total Hours:	Comment:
Sample Receipt	2	1	2	Hours per 12 samples
Sample Preparation	5	1	5	Hours per 12 samples
Instrument Analysis	5	1	5	Hours per 12 samples
Quality Control Review	2	1	2	1.5 hours per 12 samples
Quality Assurance Review	1	1	1	Hours per 12 samples

7.0 STAFF DEVELOPMENT

None anticipated.

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WORK/QUALITY ASSURANCE PROJECT PLAN

Attachment 1: Target Samples

Shipment: **SHP-220912-02**

Status: Pending

Description: NBK Keyport PFAS SI

Range: E6452-E6463

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	E6452	NBKK-B76-SB01-0203	08/30/2022 11:05 am	SO	R0119 (NA)			
2	E6453	NBKK-B76-SB02-0203	08/30/2022 2:20 pm	SO	R0119 (NA)			
3	E6454	NBKK-B76-SB03-0203	08/30/2022 12:35 pm	SO	R0119 (NA)			
4	E6455	NBKK-B76-SB03-3334	09/01/2022 1:10 pm	SO	R0119 (NA)			
5	E6456	NBKK-OU2A5-SS01-0H01	09/07/2022 1:10 pm	SO	R0119 (NA)			
6	E6457	NBKK-B76-SB04-5859	09/06/2022 11:40 am	SO	R0119 (NA)			
7	E6458	NBKK-B76-SS05-0001	09/02/2022 11:05 am	SO	R0119 (NA)			
8	E6459	NBKK-OU2A5-SS03P-0102	09/07/2022 10:50 am	SO	R0119 (NA)			
9	E6460	NBKK-OU2A5-SS03-0102	09/07/2022 10:50 am	SO	R0119 (NA)			
10	E6461	NBKK-B76-SB02-4849	08/31/2022 3:10 pm	SO	R0119 (NA)			
11	E6462	NBKK-B76-SB04-0102	08/31/2022 10:00 am	SO	R0119 (NA)			
12	E6463	NBKK-B76-SB01-2526	08/30/2022 1:55 pm	SO	R0119 (NA)			

Shipment: **SHP-220916-02**

Status: Pending

Description: NBK Keyport

Range: E6619-E6620

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	E6619	NBKK-OU2A5-SB02-0102	09/07/2022 11:15 am	SO	R0119 (NA)			
2	E6620	NBKK-OU2A5-SB03-3334	09/08/2022 11:10 am	SO	R0119 (NA)			

Shipment: **SHP-221004-07**

Status: Pending

Description: NBK Keyport

Range: E7804-E7815

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	E7804	NBKK-CF1-SS05-0001	09/30/2022 10:08 am	SOIL	R0119 (NA)			
2	E7806	NBKK-CF1-SS04-0001	09/30/2022 10:55 am	SOIL	R0119 (NA)			
3	E7807	NBKK-B1006-SS05-0001	09/30/2022 12:03 pm	SOIL	R0119 (NA)			
4	E7809	NBKK-B1006-SS06-0001	09/30/2022 12:37 pm	SOIL	R0119 (NA)			
5	E7810	NBKK-B1006-SS07-0001	09/30/2022 1:03 pm	SOIL	R0119 (NA)			
6	E7811	NBKK-B1006-SS01-0102	10/01/2022 9:35 am	SOIL	R0119 (NA)			

BATTELLE
It can be done

WORK/QUALITY ASSURANCE PROJECT PLAN

Shipment: **SHP-221004-07**

Status: Pending

Description: NBK Keyport

Range: E7804-E7815

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
7	E7812	NBKK-B1006-SS02-0102	10/01/2022 10:55 am	SOIL	R0119 (NA)			
8	E7813	NBKK-B1006-SS03-0001	10/01/2022 11:30 am	SOIL	R0119 (NA)			
9	E7814	NBKK-B76-SB05-0304	10/01/2022 2:35 pm	SOIL	R0119 (NA)			
10	E7815	NBKK-LFEX-SS03-0102	10/03/2022 10:00 am	SOIL	R0119 (NA)			

Shipment: **SHP-221011-05**

Status: Pending

Description: PNW PFAS SI NBK KEYPORT

Range: E8151-E8156

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	E8151	NBKK-LFEX-SB03-0708	10/03/2022 2:50 pm	SOIL	R0119 (NA)			
2	E8152	NBKK-LFEX-SB03-1718	10/03/2022 2:55 pm	SOIL	R0119 (NA)			
3	E8153	NBKK-LFEX-SS02-0001	10/03/2022 2:05 pm	SOIL	R0119 (NA)			
4	E8154	NBKK-LFEX-SB02-2122	10/04/2022 2:25 pm	SOIL	R0119 (NA)			
5	E8155	NBKK-LFEX-SS01-0001	10/04/2022 2:35 pm	SOIL	R0119 (NA)			
6	E8156	NBKK-LFEX-SS04-0001	10/04/2022 5:05 pm	SOIL	R0119 (NA)			

Shipment: **SHP-221013-06**

Status: Pending

Description: PNW PFAS SI NBK-KEYPART

Range: E8359-E8363

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	E8359	NBKK-LFEX-SB01-2728	10/06/2022 4:20 pm	SOIL	R0119 (NA)			
2	E8360	NBKK-LFEX-SB04-2627	10/07/2022 3:20 pm	SOIL	R0119 (NA)			
3	E8361	NBKK-CF1-SB02-1H2H	10/07/2022 4:20 pm	SOIL	R0119 (NA)			
4	E8362	NBKK-CF1-SS01-0001	10/08/2022 9:15 am	SOIL	R0119 (NA)			
5	E8363	NBKK-CF1-SB03-0102	10/08/2022 11:25 am	SOIL	R0119 (NA)			

Shipment: **SHP-221019-07**

Status: Pending

Description: PNW PFAS SI NBK-Keyport

Range: E8546-E8547

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	E8546	NBKK-CF1-MW01-5152	10/13/2022 3:15 pm	SOIL	R0119 (NA)			

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It can be done

WORK/QUALITY ASSURANCE PROJECT PLAN

Shipment: **SHP-221019-07**

Status: Pending

Description: PNW PFAS SI NBK-Keyport

Range: E8546-E8547

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
2	E8547	NBKK-CF1-MW03-5152	10/15/2022 10:20 am	SOIL	R0119 (NA)			

Shipment: **SHP-221028-01**

Status: Pending

Description: PNW PFAS SI NBK-KEYPORT

Range: E9287-E9291

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	E9287	NBKK-S7-SS04-0102	10/25/2022 9:20 am	SOIL	R0119 (NA)			
2	E9288	NBKK-S7-SB04-0910	10/25/2022 3:15 pm	SOIL	R0119 (NA)			
3	E9289	NBKK-S7-SS05-0102	10/26/2022 11:45 am	SOIL	R0119 (NA)			
4	E9291	NBKK-S7-SB05-0910	10/26/2022 2:20 pm	SOIL	R0119 (NA)			

Shipment: **SHP-221031-02**

Status: Pending

Description: PNW PFAS SI NBK Keyport

Range: E9337-E9346

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	E9337	NBKK-IDW01-SO-102722	10/27/2022 1:00 pm	SOIL	R0119 (NA)			
2	E9338	NBKK-IDW02-SO-102722	10/27/2022 1:45 pm	SOIL	R0119 (NA)			
3	E9339	NBKK-IDW03-SO-102722	10/27/2022 2:15 pm	SOIL	R0119 (NA)			
4	E9341	NBKK-S7-SS02-0001	10/27/2022 11:25 am	SOIL	R0119 (NA)			
5	E9342	NBKK-S7-SS02-0001 MS	10/27/2022 11:25 am	SOIL	R0119 (NA)			
6	E9343	NBKK-S7-SS02-0001 MSD	10/27/2022 11:25 am	SOIL	R0119 (NA)			
7	E9345	NBKK-S7-SB02-1011	10/27/2022 3:15 pm	SOIL	R0119 (NA)			
8	E9346	NBKK-S7-SS01-0102	10/28/2022 10:00 am	SOIL	R0119 (NA)			

Shipment: **SHP-221103-06**

Status: Pending

Description: PNW PFAS SI NBK KEYORT

Range: E9604-E9612

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:

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WORK/QUALITY ASSURANCE PROJECT PLAN

Shipment: **SHP-221103-06**

Status: Pending

Description: PNW PFAS SI NBK KEYORT

Range: E9604-E9612

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	E9604	NBKK-S7-SB01-0809	10/28/2022 1:30 pm	SO	R0119 (NA)			
2	E9605	NBKK-OU2A5-SB02-2930	10/29/2022 1:15 pm	SO	R0119 (NA)			
3	E9606	NBKK-OU2A5-SB02P-2930	10/29/2022 1:15 pm	SO	R0119 (NA)			
4	E9607	NBKK-OU2A5-SB01-3637	10/31/2022 2:00 pm	SO	R0119 (NA)			
5	E9608	NBKK-OU2A5-SB05-0203	11/01/2022 10:55 am	SO	R0119 (NA)			
6	E9609	NBKK-OU2A5-SB05-1011	11/01/2022 12:10 pm	SO	R0119 (NA)			
7	E9610	NBKK-OU2A5-SB04-0203	11/01/2022 12:45 pm	SO	R0119 (NA)			
8	E9611	NBKK-OU2A5-SB04-0506	11/01/2022 2:30 pm	SO	R0119 (NA)			
9	E9612	NBKK-CF1-SS02-0H01	11/01/2022 4:55 pm	SO	R0119 (NA)			

Shipment: **SHP-221110-02**

Status: Pending

Description: NBK Keyport

Range: E9763-E9777

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	E9763	NBKK-CF1-SB02-3839	11/02/2022 2:00 pm	SO	R0119 (NA)			
2	E9764	NBKK-B1006-SS04-0H01	11/03/2022 1:10 pm	SO	R0119 (NA)			
3	E9765	NBKK-B1006-SS04P-0H01	11/03/2022 1:10 pm	SO	R0119 (NA)			
4	E9766	NBKK-OU2A2-SS02-0H01	11/04/2022 10:10 am	SO	R0119 (NA)			
5	E9767	NBKK-OU2A2-SS03-0203	11/04/2022 1:30 pm	SO	R0119 (NA)			
6	E9768	NBKK-OU2A2-SS03-0203-MS	11/04/2022 1:30 pm	SO	R0119 (NA)			
7	E9769	NBKK-OU2A2-SS03-0203-MSD	11/04/2022 1:30 pm	SO	R0119 (NA)			
8	E9770	NBKK-OU2A2-SS01-0H01	11/05/2022 9:00 am	SO	R0119 (NA)			
9	E9771	NBKK-OU2A2-SS04-0203	11/07/2022 11:45 am	SO	R0119 (NA)			
10	E9773	NBKK-OU2A2-SS05-0102	11/08/2022 9:10 am	SO	R0119 (NA)			
11	E9775	NBKK-OU2A2-SS06-0H01	11/08/2022 10:40 am	SO	R0119 (NA)			
12	E9776	NBKK-OU2A2-SS06-0304	11/08/2022 10:55 am	SO	R0119 (NA)			

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WORK/QUALITY ASSURANCE PROJECT PLAN

Shipment: **SHP-221110-02**

Status: Pending

Description: NBK Keyport

Range: E9763-E9777

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
13	E9777	NBKK-OU2A2-SB05-0607	11/08/2022 11:45 am	SO	R0119 (NA)			

Shipment: **SHP-221115-01**

Status: Pending

Description: NBK KEYPORT

Range: D0013-D0015

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	D0013	NBKK-OU2A2-SD01-0004	11/10/2022 2:55 pm	SOIL	R0119 (NA)			
2	D0014	NBKK-OU2A2-SD02-0004	11/10/2022 3:15 pm	SOIL	R0119 (NA)			
3	D0015	NBKK-OU2A2-SD03-0004	11/10/2022 2:05 pm	SOIL	R0119 (NA)			

Shipment: **SHP-221117-06**

Status: Pending

Description: PNW PFAS SI

Range: D0215-D0220

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	D0215	NBKK-IDW05-SO-111522	11/15/2022 9:40 am	SOIL	R0119 (NA)			
2	D0216	NBKK-IDW06-SO-111522	11/15/2022 10:45 am	SOIL	R0119 (NA)			
3	D0217	NBKK-IDW07-SO-111522	11/15/2022 11:45 am	SOIL	R0119 (NA)			
4	D0218	NBKK-IDW08-SO-111522	11/15/2022 1:15 pm	SOIL	R0119 (NA)			
5	D0219	NBKK-IDW09-SO-111522	11/15/2022 2:00 pm	SOIL	R0119 (NA)			
6	D0220	NBKK-IDW10-SO-111522	11/15/2022 2:40 pm	SOIL	R0119 (NA)			

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WORK/QUALITY ASSURANCE PROJECT PLAN

Attachment 2: Test Codes

Project Test Code Name:	Master_369D
SOP Reference:	5-369 - Analysis of Perfluoroalkyl Substances in Environmental Samples by Liquid Chromatography and Tandem Mass Spectrometry (LC-MS/MS)
Description:	PFAS by DoD QSM 5.3 Table B-15
Matrix:	S - Solid Samples, like soil or sediment, prepared and anlyzed under the same class of detection limits.
Detection Limit Study:	5-369
Instrument:	LC-MS/MS
MQO Criteria	Universal_LC
Standard Report:	Standard Result Report

Method Specific Reporting				Holding Times (days)		Data Flags	
Result Units:	ng/g	***Unit Conversion:***	(none)	***Sample:***	14	***DL_Flag:***	U
Weight Basis:	DRY	***Result Format:***	Fixed Digits	***Frozen:***	14	***RL_Flag:***	J
Standard Basis:	SIS	***# of Figures/Digits:***	2	***Extract:***	28	***PB_Flag:***	B
Oil Weight Basis:	No	***Oil Weight Source:***	Oil Weight			***DIL_Flag:***	D
U-Value Substition:	U-Flag=MD	***Histograms:***	No			***HT_Flag:***	T
ECD_Reporting:	No						

No:	Analyte:	Report Name:	Type	RIS	SIS	Hidden:	Graph:
1	Perfluoro-n-hexanoic acid	PFHxA	T		13C5-PFHxA	No	No
2	Perfluoro-n-heptanoic Acid	PFHpA	T		13C4-PFHpA	No	No
3	Perfluoro-n-octanoic Acid	PFOA	T		13C8-PFOA	No	No
4	Perfluorononanoic Acid	PFNA	T		13C9-PFNA	No	No
5	Perfluoro-n-decanoic Acid	PFDA	T		13C6-PFDA	No	No
6	Perfluoro-n-undecanoic acid	PFUnA	T		13C7-PFUnA	No	No
7	Perfluoro-n-dodecanoic acid	PFDoA	T		13C2-PFDoA	No	No
8	Perfluoro-n-tridecanoic acid	PFTrDA	T		13C2-PFTeDA	No	No
9	Perfluoro-n-tetradecanoic acid	PFTeDA	T		13C2-PFTeDA	No	No
10	N-methylperfluoro-1-octanesulfonamidoacetic acid	NMeFOSAA	T		d3-MeFOSAA	No	No
11	N-ethylperfluoro-octanesulfonamidoacetic acid	NEtFOSAA	T		d5-EtFOSAA	No	No
12	Perfluoro-1-butanesulfonate	PFBS	T		13C3-PFBS	No	No
13	Perfluoro-1-hexanesulfonate	PFHxS	T		13C3-PFHxS	No	No
14	Perfluoro-1-octanesulfonate	PFOS	T		13C8-PFOS	No	No
15	Hexafluoropropylene oxide dimer acid	HFPO-DA	T		13C3-HFPO-DA	No	No
16	Adona	Adona	T		13C8-PFOA	No	No
17	9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	9Cl-PF3ONS	T		13C8-PFOA	No	No

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WORK/QUALITY ASSURANCE PROJECT PLAN

Attachment 2: Test Codes

Project Test Code Name: Master_369D

No:	Analyte:	Report Name:	Type	RIS	SIS	Hidden:	Graph:
18	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	11Cl-PF3OUdS	T		13C8-PFOA	No	No
1	13C5-PFHxA	13C5-PFHxA	SIS	13C2-PFOA		No	No
2	13C4-PFHpA	13C4-PFHpA	SIS	13C2-PFOA		No	No
3	13C8-PFOA	13C8-PFOA	SIS	13C2-PFOA		No	No
4	13C9-PFNA	13C9-PFNA	SIS	13C2-PFOA		No	No
5	13C6-PFDA	13C6-PFDA	SIS	13C2-PFDA		No	No
6	13C7-PFUnA	13C7-PFUnA	SIS	13C2-PFDA		No	No
7	13C2-PFDoA	13C2-PFDoA	SIS	13C2-PFDA		No	No
8	13C2-PFTeDA	13C2-PFTeDA	SIS	13C2-PFDA		No	No
9	d3-MeFOSAA	d3-MeFOSAA	SIS	13C4-PFOS		No	No
10	d5-EtFOSAA	d5-EtFOSAA	SIS	13C4-PFOS		No	No
11	13C3-PFBS	13C3-PFBS	SIS	13C4-PFOS		No	No
12	13C3-PFHxS	13C3-PFHxS	SIS	13C4-PFOS		No	No
13	13C8-PFOS	13C8-PFOS	SIS	13C4-PFOS		No	No
14	13C3-HFPO-DA	13C3-HFPO-DA	SIS	13C2-PFOA		No	No

Total Analytes: 32

Subtract Peaks:

None

Sum Peaks:

None

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WORK/QUALITY ASSURANCE PROJECT PLAN

Attachment 2: Test Codes

Project Test Code Name: Master_369D

ICAL Acceptance Criteria:

Curve Fit:	Limit Mean(%):	Mean Qual:	Limit Ind.:	Ind. Qual:	Min Points:	Points Qual:	Comments:
Linear	NA	NA	0.99	N	5	N	y = Bx + C
Quadratic	NA	NA	0.99	N	6	N	y = Ax^2 + Bx + C

Continuing Calibration Verification Criteria:

CCV Name: 5-369

Frequency Hrs:		Mean PD(%):		Individual PD(%):		RIS/SIS RT Window (min):		Area Limit Low(%):	Area Limit High(%):		Comment:
12	(N)	30	(N)	30	(N)	0.04	(N)	-50	100	(N)	NA

Independent Calibration Verification:

ICC Name: 5-369

Mean PD Limit(%):		Ind. PD Limit(%):		RIS/SIS Window Limit (Secs):		Area Limit High(%):	Area Limit Low(%):		Comment:
30	(N)	30	(N)	0.04	(N)	-50	100	(N)	NA

Mass Discrimination Criteria:

None

Degredation Check Criteria:

None

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WORK/QUALITY ASSURANCE PROJECT PLAN

Attachment 3: Method Quality Objectives

MQO Application:	***Universal_LC***		
MQO:	**Acceptance Criteria:**	**Qual:**	**Corrective Action:**
Procedural Blank	Samples must be greater than five times the blank concentration (>5xPB).	B	Review with Project Manager; re-analyze or justify results in project records.
PB Measurement Quality Objective	Organic results in the Procedural Blank are less than 1/2 times the LOQ (<1/2xLOQ)	N	Review with Project Manager; re-analyze or justify results in project records.
Laboratory Control Sample	Recovery values 70-130%.	N	Review with project manager; re-analyze or justify reporting the results in project records.
Matrix Spike / Matrix Spike Duplicate Recovery	Organics 70-130%. Analyte concentration in MS/MSD must be greater than five times reported background concentration.	N	Review with Project Manager; re-analyze or justify reporting results in the project records.
	Organics Results in the Target is less than 5 times the Original	n	
Matrix Spike/Spike Duplicate Precision	Organics results less than 30% Relative Percent Difference (RPD). Analyte concentration in MS/MSD must be greater than five times reported background concentration.	N	Review with Project Manager; re-analyze or justify reporting results in the project records.
	Organics Results in the Target is less than 5 times the Original	n	
Standard Reference Material Accuracy	Organics Percent Difference less than 30% from a range of certified values on average. Analyte concentration must be greater than five times the Method Detection Limit (>5xMDL).	N	Review with Project Manager; re-analyze or justify reporting results in the project records.
	Organics Results in the Target is less than 5 times the MDL	n	
Analytical Duplicate Precision	Organics results less than 30% Relative Percent Difference (RPD). Analyte concentration must be > 5x MDL.	N	Review with Project Manager; re-analyze or justify reporting results in the project records.
	Organics Results in the Original is less than 5 times the MDL	n	

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WORK/QUALITY ASSURANCE PROJECT PLAN

Attachment 3: Method Quality Objectives

MQO Application:	***Universal_LC***		
MQO:	**Acceptance Criteria:**	**Qual:**	**Corrective Action:**
Analytical Triplicate Precision	Organics results less than 30% Relative Standard Deviation (RSD). Analyte concentration must be > 5x MDL.	N	Review with Project Manager; re-analyze or justify reporting results in the project records.
	Organics Results in the Original is less than 5 times the MDL	n	
Surrogate Compound Recovery	Recovery results between 50% and 150%.	N	Review with Project Manager; re-analyze or justify reporting results in the project records.
Control Oil	RPD < 30% for at least 90% of analytes	N	Results examined by project manager, task leader, or subcontractor lab manager. Reextraction, reanalysis, or justification documented.
Instrument Calibration	5-369-9: R-squared greater than or equal to 0.990		Results examined by project manager, task leader, or subcontractor lab manager. Reextraction, reanalysis, or justification documented.
Independent Calibration Check Solution	5-369-9: Individual PD less than or equal to 30%. Mean Percent Difference less than or equal to 30%.	N	Review with Project Manager; re-analyze or justify in project records.
Continuing Calibration Verification	5-369-9: Individual PD less than or equal to 30%. Mean Percent Difference less than or equal to 30%.	N	Review with Project Manager; re-analyze or justify in project records.

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ShpNo SHP-221117-06

Battelle Project No:

Sample Receipt Form

Approved: ☐ Authorized ☐

Project Number: **Client:**

Received by: Schumitz, Matt **Date/Time Received:** Thursday, November 17, 2022 10:00 AM

No. of Shipping Containers: 1

SHIPMENT

Method of Delivery: Commercial Carrier **Tracking Number:** Fed Ex

COC Forms: ☑ **Shipped with samples** ☐ **No Forms**

Cooler(s)/Box(es)

Cntr	Type	Tracking No.	Seal	Seal	Container	Therm.	Temp C	Smps
1 of 1	Cooler	39073109956	Custody Seals	Intact	Intact	Therm_1	2.9	6

Samples

Sample Labels:
☑ Sample labels agree with COC forms
☐ Discrepancies (see Sample Custody Corrective Action Form)

Container Seals:
☐ Tape ☐ Custody Seals ☐ Other Seals (See sample Log)
☑ Seals intact for each shipping container
☐ Seals broken (See sample log for impacted samples)

Condition of Samples:
☑ Sample containers intact
☐ Sample containers broken/leaking (See Custody Corrective Action Form)

Temperature upon receipt (°C): 2.9 Temperature Blank used ☑ Yes ☐ No
(Note: If temperature upon receipt differs from required conditions, see sample log comment field)

Samples Acidified: ☐ Yes ☐ No ☑ Unknown

Initial pH 5-9?: ☐ Yes ☐ No ☑ NA
If no, individual sample adjustments on the Auxiliary Sample Receipt Form

Total Residual Chlorine Present?: ☐ Yes ☐ No ☑ NA
If yes, individual sample adjustments on the Auxiliary Sample Receipt Form

Head Space <1% in samples for water VOC analysis: ☐ Yes ☐ No ☑ NA
Individual sample deviations noted on sample log

Samples Containers:
Samples returned in PC-grade jars: ☐ Yes ☐ No ☑ Unknown /Lot No.: Unknown

Storage Location: Custody: Refrigerator - R0119 (NA) **BDO IDs Assigned:** D0215 - D0220

Samples logged in by: Anderson, Jada **Date/Time:** 11/17/2022 10:00 AM

Approved By: **Approved On:**

Authorized By: **Authorized On:**

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ShpNo: SHP-221117-06

Battelle Project No: 026.000001

Report Corrective Actions

Corrective Action No: 1 **of** 1

Authorized ☐ Approved: ☐

COC Client:
COC Project: PNW PFAS SI
COC Date: 11/17/2022 1:22

	Description of Problem:	Explanation:
Client Id	Jars and C-O-C do not have matching Ids	Sample NBKK-IDW05-SO-111522 does not have a matching time on C-O-C. The C-O-C says 9:40, however the recorded time on the sample says 9:50.

Documentation of project manager notification

Sample Custodian Anderson, Jada **Date:** 11/17/2022 4:14:00 P

Laboratory Manager: Lizotte Jr, Robert **Date:** 12/27/2022 12:07:00 P

Project Manager: Lizotte Jr, Robert **Date:** 12/27/2022 12:07:00 P

Documentation of client notification (should be completed by project manager within 24 hrs):

On 17-Nov-22 **I contacted** Acaron, Juan **at** CH2M

Results of communication with client (Describe any corrective action directed by the client):

See email

Date this form was received back to the custodian:

Reference Number:

From: Weatherspoon, Alisha
To: Schumitz, Matt (US); Acaron, Juan
Cc: Thorn, Jonathan (US); Lizotte Jr, Robert (US); Davis, Tiffany; Camus, Seng; Shiroodi, Kim
Subject: RE: CTO-4117 Keyport 11/17/22
Date: Friday, November 18, 2022 2:11:59 PM
Attachments: image001.png

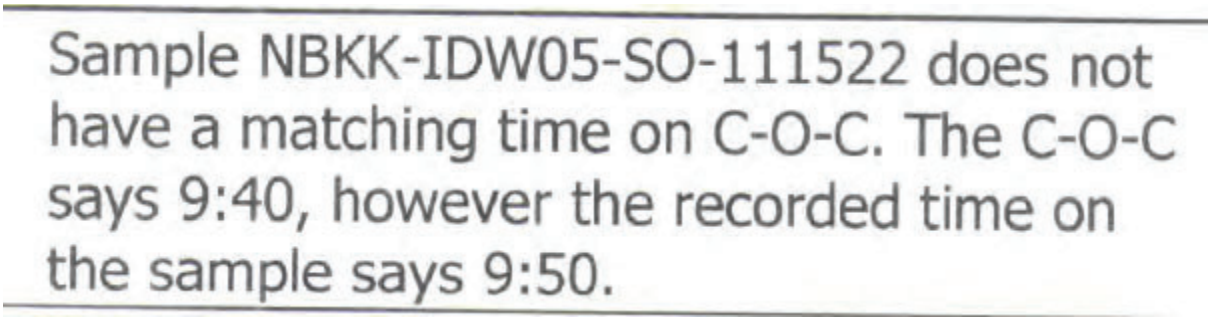
Hi Matt – 9:40 is correct.

Thank you!
Alisha

Alisha Weatherspoon (she/her) | Environmental Engineer | M: 708.653.8123 |
alisha.weatherspoon@jacobs.com | www.jacobs.com [jacobs.com]

From: Schumitz, Matt (US) <SCHUMITZM@battelle.org>
Sent: Friday, November 18, 2022 9:48 AM
To: Acaron, Juan <Juan.Acaron@jacobs.com>
Cc: Thorn, Jonathan R <thorn@battelle.org>; Lizotte Jr, Robert (US) <lizotte@battelle.org>; Davis, Tiffany <tiffany.davis1@jacobs.com>; Camus, Seng <Seng.Camus@jacobs.com>; Shiroodi, Kim <Kim.Shiroodi@jacobs.com>; Weatherspoon, Alisha <Alisha.Weatherspoon@jacobs.com>
Subject: [EXTERNAL] RE: CTO-4117 Keyport 11/17/22

Apologies for not noting this in my last email.



Can someone please verify the correct time?

From: Schumitz, Matt (US)
Sent: Friday, November 18, 2022 10:45 AM
To: 'Acaron, Juan/GNV' <Juan.Acaron@jacobs.com>
Cc: Thorn, Jonathan (US) <thorn@battelle.org>; Lizotte Jr, Robert (US) <lizotte@battelle.org>; 'Davis, Tiffany/GNV' <tiffany.davis1@jacobs.com>; 'Camus, Seng' <Seng.Camus@jacobs.com>; 'Shiroodi, Kim' <Kim.Shiroodi@jacobs.com>; 'Weatherspoon, Alisha' <Alisha.Weatherspoon@jacobs.com>
Subject: CTO-4117 Keyport 11/17/22

Hello All

The attached custody records are for the samples received yesterday, all in good condition.

Results will be reported as follows:

SDG	Matrix	Due date
22-2094	Solids	12/16/22 (28-day TAT)

Thanks Matt

Matthew Schumitz
Technician Specialist / Sample Custodian
Hazardous Waste Coordinator
Analytical Chemistry Services
Office: 781.681.5588
schumitzm@battelle.org

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141 Longwater Dr.
Suite 202
Norwell, MA 02061
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Twitter [urldefense.com] | YouTube [urldefense.com]

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ShpNo SHP-221117-06

Battelle Project No:

Sample Receipt Form Details

Approved: ☐ Authorized ☐

Project Number: **Client:**

Received by: Schumitz, Matt **Date/Time Received:** Thursday, November 17, 2022 10:00 AM

No. of Shipping Containers: 1

BDO Id:	Client Sample ID:	Collection Date:	Login Date:	Ctrs:	Matrix:	Temp:	pH:	TRC:	VOC:	Stored In:	Loc:	No:	Comments:
D0215	NBKK-IDW05-SO-111522	11/15/22 9:40	11/17/22 13:28	1	SOIL	2.9	NA	NA	NA	R0119 (NA)			
D0216	NBKK-IDW06-SO-111522	11/15/22 10:45	11/17/22 13:29	1	SOIL	2.9	NA	NA	NA	R0119 (NA)			
D0217	NBKK-IDW07-SO-111522	11/15/22 11:45	11/17/22 13:29	1	SOIL	2.9	NA	NA	NA	R0119 (NA)			
D0218	NBKK-IDW08-SO-111522	11/15/22 13:15	11/17/22 13:29	1	SOIL	2.9	NA	NA	NA	R0119 (NA)			
D0219	NBKK-IDW09-SO-111522	11/15/22 14:00	11/17/22 13:30	1	SOIL	2.9	NA	NA	NA	R0119 (NA)			
D0220	NBKK-IDW10-SO-111522	11/15/22 14:40	11/17/22 13:30	1	SOIL	2.9	NA	NA	NA	R0119 (NA)			

Total Samples: 6

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Chain of Custody

Project Name: PNW PFAS SI	Client Project Manager: Dennis Ballam	Client Project Number: 70[illegible]	Test / Preservative[1]: PFAS
Deliver Results to: Juan Acaron	Samples Collected by: Ilka Dinkelman		COC Number:
Address:	Phone: 775-336-9176		Turnaround Time[2]: ☒ 28-days (standard) ☐ 21-days (Rush) ☐ 14-days (Rush) ☐ 7-days (Rush) ☐ 3-day (Rush)
Phone: 352,214,2814	Email: ilka.dinkelman@jacobs.com		
Email: juan.acaron@jacobs.com	Time Zone: PST		
	PO reference: Purchase Order Requests		

Sample ID	Date	Time	Type[3]	Matrix	Count	Lab ID	PFAS	Sample Comments
NBKK-IDW05-SO-111522	11/15/22	9:40	C	Soil	1	D0215	1	
NBKK-IDW06-SO-111522	11/15/22	10:45	C	Soil	1	16	1	
NBKK-IDW07-SO-111522	11/15/22	11:45	C	Soil	1	17	1	
NBKK-IDW08-SO-111522	11/15/22	13:15	C	Soil	1	18	1	
NBKK-IDW09-SO-111522	11/15/22	14:00	C	Soil	1	19	1	
NBKK-IDW10-SO-111522	11/15/22	14:40	C	Soil	1	20	1	

	Company:	Date/Time:	Received by (Print/Sign):	Company:	Date/Time:
Relinquished by (Print/Sign): Ilka Dinkelman	Jacobs	11/15/22 15:15	Nathan Lee Matthews	Jacobs	11/15/22 1550
Relinquished by (Print/Sign): Nathan Lee Matthews	Jacobs	11/16/22	FedEx		
Relinquished by (Print/Sign):	Company:	Date/Time:	Received by (Print/Sign):	Company: BNO	Date/Time: 11/17/22 1000

Field Project comments:

Receipt comments:

[1] include comments in the Field Project comment field if there are method specific requirements, i.e., "WHO PCB Congener list", "PFAS – 18 analytes", or "PFAS – 29 analytes from UCMR5"

[2] Rush TAT request should be verified with the lab prior to submitting samples

[3] Client sample type, if applicable

ORIGIN ID:PWTA (781) 681-5565
JACOBS
5701 CLEVELAND ST STE 200
VIRGINIA BEACH, VA 23462
UNITED STATES US

SHIP DATE: 16NOV22
ACTWGT: 35.30 LB
CAD: 6992271/SSF02322
DIMS: 24x13x13 IN
BILL THIRD PARTY

TO BATELLE ANALYTICAL SERVICES
141 LONGWATER DR., SUITE 202
NORWELL MA 02061
(000) 000-0000
REF:
INV:
PO:
DEPT:

Part # 156297-435 RRDB2 EXP 10/23

FedEx Express

TRK# 0201 3907 3109 9456

THU - 17 NOV 10:30A
PRIORITY OVERNIGHT
AHS
02061
MA-US BOS

XE XPUA

Term!
2.9°

Data Tables

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It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-IDW05-SO-111522
Battelle ID	D0215-FS
Sample Type	SA
Collection Date	11/15/2022
Extraction Date	11/28/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	14.18
Matrix	SOIL
Sample Size	4.290
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)		Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.583	U	D0215-FS(0)	1.000	12/22/2022	0.207	0.583	1.17
PFHpA	375-85-9	0.583	U	D0215-FS(0)	1.000	12/22/2022	0.196	0.583	1.17
PFOA	335-67-1	0.583	U	D0215-FS(0)	1.000	12/22/2022	0.249	0.583	1.17
PFNA	375-95-1	0.583	U	D0215-FS(0)	1.000	12/22/2022	0.183	0.583	1.17
PFDA	335-76-2	0.583	U	D0215-FS(0)	1.000	12/22/2022	0.184	0.583	1.17
PFUnA	2058-94-8	0.583	U	D0215-FS(0)	1.000	12/22/2022	0.182	0.583	1.17
PFDoA	307-55-1	0.583	U	D0215-FS(0)	1.000	12/22/2022	0.186	0.583	1.17
PFTrDA	72629-94-8	0.583	U	D0215-FS(0)	1.000	12/22/2022	0.188	0.583	1.17
PFTeDA	376-06-7	0.583	U	D0215-FS(0)	1.000	12/22/2022	0.189	0.583	2.33
NMeFOSAA	2355-31-9	0.583	U	D0215-FS(0)	1.000	12/22/2022	0.185	0.583	2.33
NEtFOSAA	2991-50-6	0.583	U	D0215-FS(0)	1.000	12/22/2022	0.192	0.583	2.33
PFBS	375-73-5	0.583	U	D0215-FS(0)	1.000	12/22/2022	0.199	0.583	1.17
PFHxS	355-46-4	0.583	U	D0215-FS(0)	1.000	12/22/2022	0.202	0.583	1.17
PFOS	1763-23-1	0.415	J	D0215-FS(0)	1.000	12/22/2022	0.204	0.583	1.17
HFPO-DA	13252-13-6	0.583	U	D0215-FS(0)	1.000	12/22/2022	0.185	0.583	2.33
Adona	919005-14-4	0.583	U	D0215-FS(0)	1.000	12/22/2022	0.186	0.583	2.33
9Cl-PF3ONS	756426-58-1	0.583	U	D0215-FS(0)	1.000	12/22/2022	0.179	0.583	2.33
11Cl-PF3OUdS	763051-92-9	0.583	U	D0215-FS(0)	1.000	12/22/2022	0.175	0.583	2.33

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-IDW05-SO-111522
Battelle ID	D0215-FS
Sample Type	SA
Collection Date	11/15/2022
Extraction Date	11/28/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS

Surrogate Recoveries (%)	**Recovery**	**Extract ID**	**Analysis Date**
13C5-PFHxA	65	D0215-FS(0)	12/22/2022
13C4-PFHpA	65	D0215-FS(0)	12/22/2022
13C8-PFOA	80	D0215-FS(0)	12/22/2022
13C9-PFNA	66	D0215-FS(0)	12/22/2022
13C6-PFDA	75	D0215-FS(0)	12/22/2022
13C7-PFUnA	72	D0215-FS(0)	12/22/2022
13C2-PFDoA	62	D0215-FS(0)	12/22/2022
13C2-PFTeDA	59	D0215-FS(0)	12/22/2022
d3-MeFOSAA	64	D0215-FS(0)	12/22/2022
d5-EtFOSAA	52	D0215-FS(0)	12/22/2022
13C3-PFBS	65	D0215-FS(0)	12/22/2022
13C3-PFHxS	71	D0215-FS(0)	12/22/2022
13C8-PFOS	60	D0215-FS(0)	12/22/2022
13C3-HFPO-DA	67	D0215-FS(0)	12/22/2022

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-IDW06-SO-111522
Battelle ID	D0216-FS
Sample Type	SA
Collection Date	11/15/2022
Extraction Date	11/28/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	14.64
Matrix	SOIL
Sample Size	4.260
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.587 U	D0216-FS(0)	1.000	12/22/2022	0.209	0.587	1.17
PFHpA	375-85-9	0.587 U	D0216-FS(0)	1.000	12/22/2022	0.197	0.587	1.17
PFOA	335-67-1	0.587 U	D0216-FS(0)	1.000	12/22/2022	0.251	0.587	1.17
PFNA	375-95-1	0.587 U	D0216-FS(0)	1.000	12/22/2022	0.184	0.587	1.17
PFDA	335-76-2	0.587 U	D0216-FS(0)	1.000	12/22/2022	0.185	0.587	1.17
PFUnA	2058-94-8	0.587 U	D0216-FS(0)	1.000	12/22/2022	0.183	0.587	1.17
PFDoA	307-55-1	0.587 U	D0216-FS(0)	1.000	12/22/2022	0.188	0.587	1.17
PFTrDA	72629-94-8	0.587 U	D0216-FS(0)	1.000	12/22/2022	0.189	0.587	1.17
PFTeDA	376-06-7	0.587 U	D0216-FS(0)	1.000	12/22/2022	0.190	0.587	2.35
NMeFOSAA	2355-31-9	0.587 U	D0216-FS(0)	1.000	12/22/2022	0.187	0.587	2.35
NEtFOSAA	2991-50-6	0.587 U	D0216-FS(0)	1.000	12/22/2022	0.194	0.587	2.35
PFBS	375-73-5	0.587 U	D0216-FS(0)	1.000	12/22/2022	0.201	0.587	1.17
PFHxS	355-46-4	0.587 U	D0216-FS(0)	1.000	12/22/2022	0.203	0.587	1.17
PFOS	1763-23-1	0.612 J	D0216-FS(0)	1.000	12/22/2022	0.205	0.587	1.17
HFPO-DA	13252-13-6	0.587 U	D0216-FS(0)	1.000	12/22/2022	0.187	0.587	2.35
Adona	919005-14-4	0.587 U	D0216-FS(0)	1.000	12/22/2022	0.188	0.587	2.35
9Cl-PF3ONS	756426-58-1	0.587 U	D0216-FS(0)	1.000	12/22/2022	0.181	0.587	2.35
11Cl-PF3OUdS	763051-92-9	0.587 U	D0216-FS(0)	1.000	12/22/2022	0.176	0.587	2.35

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It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-IDW06-SO-111522
Battelle ID	D0216-FS
Sample Type	SA
Collection Date	11/15/2022
Extraction Date	11/28/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS

Surrogate Recoveries (%)	**Recovery**	**Extract ID**	**Analysis Date**
13C5-PFHxA	61	D0216-FS(0)	12/22/2022
13C4-PFHpA	64	D0216-FS(0)	12/22/2022
13C8-PFOA	77	D0216-FS(0)	12/22/2022
13C9-PFNA	73	D0216-FS(0)	12/22/2022
13C6-PFDA	78	D0216-FS(0)	12/22/2022
13C7-PFUnA	84	D0216-FS(0)	12/22/2022
13C2-PFDoA	76	D0216-FS(0)	12/22/2022
13C2-PFTeDA	71	D0216-FS(0)	12/22/2022
d3-MeFOSAA	68	D0216-FS(0)	12/22/2022
d5-EtFOSAA	65	D0216-FS(0)	12/22/2022
13C3-PFBS	65	D0216-FS(0)	12/22/2022
13C3-PFHxS	66	D0216-FS(0)	12/22/2022
13C8-PFOS	66	D0216-FS(0)	12/22/2022
13C3-HFPO-DA	64	D0216-FS(0)	12/22/2022

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It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-IDW07-SO-111522
Battelle ID	D0217-FS
Sample Type	SA
Collection Date	11/15/2022
Extraction Date	11/28/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	15.84
Matrix	SOIL
Sample Size	4.210
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)		Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.594	U	D0217-FS(0)	1.000	12/22/2022	0.211	0.594	1.19
PFHpA	375-85-9	0.594	U	D0217-FS(0)	1.000	12/22/2022	0.200	0.594	1.19
PFOA	335-67-1	0.594	U	D0217-FS(0)	1.000	12/22/2022	0.254	0.594	1.19
PFNA	375-95-1	0.594	U	D0217-FS(0)	1.000	12/22/2022	0.186	0.594	1.19
PFDA	335-76-2	0.594	U	D0217-FS(0)	1.000	12/22/2022	0.188	0.594	1.19
PFUnA	2058-94-8	0.594	U	D0217-FS(0)	1.000	12/22/2022	0.185	0.594	1.19
PFDoA	307-55-1	0.594	U	D0217-FS(0)	1.000	12/22/2022	0.190	0.594	1.19
PFTrDA	72629-94-8	0.594	U	D0217-FS(0)	1.000	12/22/2022	0.191	0.594	1.19
PFTeDA	376-06-7	0.594	U	D0217-FS(0)	1.000	12/22/2022	0.192	0.594	2.38
NMeFOSAA	2355-31-9	0.594	U	D0217-FS(0)	1.000	12/22/2022	0.189	0.594	2.38
NEtFOSAA	2991-50-6	0.594	U	D0217-FS(0)	1.000	12/22/2022	0.196	0.594	2.38
PFBS	375-73-5	0.594	U	D0217-FS(0)	1.000	12/22/2022	0.203	0.594	1.19
PFHxS	355-46-4	0.594	U	D0217-FS(0)	1.000	12/22/2022	0.205	0.594	1.19
PFOS	1763-23-1	0.594	U	D0217-FS(0)	1.000	12/22/2022	0.208	0.594	1.19
HFPO-DA	13252-13-6	0.594	U	D0217-FS(0)	1.000	12/22/2022	0.189	0.594	2.38
Adona	919005-14-4	0.594	U	D0217-FS(0)	1.000	12/22/2022	0.190	0.594	2.38
9Cl-PF3ONS	756426-58-1	0.594	U	D0217-FS(0)	1.000	12/22/2022	0.183	0.594	2.38
11Cl-PF3OUdS	763051-92-9	0.594	U	D0217-FS(0)	1.000	12/22/2022	0.178	0.594	2.38

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It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-IDW07-SO-111522
Battelle ID	D0217-FS
Sample Type	SA
Collection Date	11/15/2022
Extraction Date	11/28/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS

Surrogate Recoveries (%)	**Recovery**	**Extract ID**	**Analysis Date**
13C5-PFHxA	60	D0217-FS(0)	12/22/2022
13C4-PFHpA	53	D0217-FS(0)	12/22/2022
13C8-PFOA	64	D0217-FS(0)	12/22/2022
13C9-PFNA	76	D0217-FS(0)	12/22/2022
13C6-PFDA	72	D0217-FS(0)	12/22/2022
13C7-PFUnA	74	D0217-FS(0)	12/22/2022
13C2-PFDoA	84	D0217-FS(0)	12/22/2022
13C2-PFTeDA	86	D0217-FS(0)	12/22/2022
d3-MeFOSAA	57	D0217-FS(0)	12/22/2022
d5-EtFOSAA	56	D0217-FS(0)	12/22/2022
13C3-PFBS	68	D0217-FS(0)	12/22/2022
13C3-PFHxS	56	D0217-FS(0)	12/22/2022
13C8-PFOS	63	D0217-FS(0)	12/22/2022
13C3-HFPO-DA	68	D0217-FS(0)	12/22/2022

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It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-IDW08-SO-111522
Battelle ID	D0218-FS
Sample Type	SA
Collection Date	11/15/2022
Extraction Date	11/28/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	18.56
Matrix	SOIL
Sample Size	4.070
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.614 U	D0218-FS(0)	1.000	12/22/2022	0.219	0.614	1.23
PFHpA	375-85-9	0.614 U	D0218-FS(0)	1.000	12/22/2022	0.206	0.614	1.23
PFOA	335-67-1	0.614 U	D0218-FS(0)	1.000	12/22/2022	0.263	0.614	1.23
PFNA	375-95-1	0.614 U	D0218-FS(0)	1.000	12/22/2022	0.193	0.614	1.23
PFDA	335-76-2	0.614 U	D0218-FS(0)	1.000	12/22/2022	0.194	0.614	1.23
PFUnA	2058-94-8	0.614 U	D0218-FS(0)	1.000	12/22/2022	0.192	0.614	1.23
PFDoA	307-55-1	0.614 U	D0218-FS(0)	1.000	12/22/2022	0.197	0.614	1.23
PFTrDA	72629-94-8	0.614 U	D0218-FS(0)	1.000	12/22/2022	0.198	0.614	1.23
PFTeDA	376-06-7	0.614 U	D0218-FS(0)	1.000	12/22/2022	0.199	0.614	2.46
NMeFOSAA	2355-31-9	0.614 U	D0218-FS(0)	1.000	12/22/2022	0.195	0.614	2.46
NEtFOSAA	2991-50-6	0.614 U	D0218-FS(0)	1.000	12/22/2022	0.203	0.614	2.46
PFBS	375-73-5	0.614 U	D0218-FS(0)	1.000	12/22/2022	0.210	0.614	1.23
PFHxS	355-46-4	0.614 U	D0218-FS(0)	1.000	12/22/2022	0.213	0.614	1.23
PFOS	1763-23-1	0.614 U	D0218-FS(0)	1.000	12/22/2022	0.215	0.614	1.23
HFPO-DA	13252-13-6	0.614 U	D0218-FS(0)	1.000	12/22/2022	0.195	0.614	2.46
Adona	919005-14-4	0.614 U	D0218-FS(0)	1.000	12/22/2022	0.197	0.614	2.46
9Cl-PF3ONS	756426-58-1	0.614 U	D0218-FS(0)	1.000	12/22/2022	0.189	0.614	2.46
11Cl-PF3OUdS	763051-92-9	0.614 U	D0218-FS(0)	1.000	12/22/2022	0.184	0.614	2.46

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-IDW08-SO-111522
Battelle ID	D0218-FS
Sample Type	SA
Collection Date	11/15/2022
Extraction Date	11/28/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS

Surrogate Recoveries (%)	**Recovery**	**Extract ID**	**Analysis Date**
13C5-PFHxA	66	D0218-FS(0)	12/22/2022
13C4-PFHpA	60	D0218-FS(0)	12/22/2022
13C8-PFOA	72	D0218-FS(0)	12/22/2022
13C9-PFNA	81	D0218-FS(0)	12/22/2022
13C6-PFDA	74	D0218-FS(0)	12/22/2022
13C7-PFUnA	61	D0218-FS(0)	12/22/2022
13C2-PFDoA	67	D0218-FS(0)	12/22/2022
13C2-PFTeDA	64	D0218-FS(0)	12/22/2022
d3-MeFOSAA	51	D0218-FS(0)	12/22/2022
d5-EtFOSAA	45 N	D0218-FS(0)	12/22/2022
13C3-PFBS	68	D0218-FS(0)	12/22/2022
13C3-PFHxS	73	D0218-FS(0)	12/22/2022
13C8-PFOS	66	D0218-FS(0)	12/22/2022
13C3-HFPO-DA	79	D0218-FS(0)	12/22/2022

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-IDW09-SO-111522
Battelle ID	D0219-FS
Sample Type	SA
Collection Date	11/15/2022
Extraction Date	11/28/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	13.20
Matrix	SOIL
Sample Size	4.340
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.576 U	D0219-FS(0)	1.000	12/22/2022	0.205	0.576	1.15
PFHpA	375-85-9	0.576 U	D0219-FS(0)	1.000	12/22/2022	0.194	0.576	1.15
PFOA	335-67-1	0.291 J	D0219-FS(0)	1.000	12/22/2022	0.247	0.576	1.15
PFNA	375-95-1	0.576 U	D0219-FS(0)	1.000	12/22/2022	0.181	0.576	1.15
PFDA	335-76-2	0.576 U	D0219-FS(0)	1.000	12/22/2022	0.182	0.576	1.15
PFUnA	2058-94-8	0.576 U	D0219-FS(0)	1.000	12/22/2022	0.180	0.576	1.15
PFDoA	307-55-1	0.576 U	D0219-FS(0)	1.000	12/22/2022	0.184	0.576	1.15
PFTrDA	72629-94-8	0.576 U	D0219-FS(0)	1.000	12/22/2022	0.185	0.576	1.15
PFTeDA	376-06-7	0.576 U	D0219-FS(0)	1.000	12/22/2022	0.187	0.576	2.30
NMeFOSAA	2355-31-9	0.576 U	D0219-FS(0)	1.000	12/22/2022	0.183	0.576	2.30
NEtFOSAA	2991-50-6	0.576 U	D0219-FS(0)	1.000	12/22/2022	0.190	0.576	2.30
PFBS	375-73-5	0.576 U	D0219-FS(0)	1.000	12/22/2022	0.197	0.576	1.15
PFHxS	355-46-4	0.576 U	D0219-FS(0)	1.000	12/22/2022	0.199	0.576	1.15
PFOS	1763-23-1	4.58	D0219-FS(0)	1.000	12/22/2022	0.202	0.576	1.15
HFPO-DA	13252-13-6	0.576 U	D0219-FS(0)	1.000	12/22/2022	0.183	0.576	2.30
Adona	919005-14-4	0.576 U	D0219-FS(0)	1.000	12/22/2022	0.184	0.576	2.30
9Cl-PF3ONS	756426-58-1	0.576 U	D0219-FS(0)	1.000	12/22/2022	0.177	0.576	2.30
11Cl-PF3OUdS	763051-92-9	0.576 U	D0219-FS(0)	1.000	12/22/2022	0.173	0.576	2.30

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-IDW09-SO-111522
Battelle ID	D0219-FS
Sample Type	SA
Collection Date	11/15/2022
Extraction Date	11/28/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS

Surrogate Recoveries (%)	**Recovery**	**Extract ID**	**Analysis Date**
13C5-PFHxA	74	D0219-FS(0)	12/22/2022
13C4-PFHpA	59	D0219-FS(0)	12/22/2022
13C8-PFOA	76	D0219-FS(0)	12/22/2022
13C9-PFNA	82	D0219-FS(0)	12/22/2022
13C6-PFDA	67	D0219-FS(0)	12/22/2022
13C7-PFUnA	71	D0219-FS(0)	12/22/2022
13C2-PFDoA	68	D0219-FS(0)	12/22/2022
13C2-PFTeDA	76	D0219-FS(0)	12/22/2022
d3-MeFOSAA	52	D0219-FS(0)	12/22/2022
d5-EtFOSAA	56	D0219-FS(0)	12/22/2022
13C3-PFBS	83	D0219-FS(0)	12/22/2022
13C3-PFHxS	67	D0219-FS(0)	12/22/2022
13C8-PFOS	76	D0219-FS(0)	12/22/2022
13C3-HFPO-DA	80	D0219-FS(0)	12/22/2022

BATTELLE
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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-IDW10-SO-111522
Battelle ID	D0220-FS
Sample Type	SA
Collection Date	11/15/2022
Extraction Date	11/28/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	15.66
Matrix	SOIL
Sample Size	4.210
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)		Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.594	U	D0220-FS(0)	1.000	12/22/2022	0.211	0.594	1.19
PFHpA	375-85-9	0.594	U	D0220-FS(0)	1.000	12/22/2022	0.200	0.594	1.19
PFOA	335-67-1	0.594	U	D0220-FS(0)	1.000	12/22/2022	0.254	0.594	1.19
PFNA	375-95-1	0.594	U	D0220-FS(0)	1.000	12/22/2022	0.186	0.594	1.19
PFDA	335-76-2	0.594	U	D0220-FS(0)	1.000	12/22/2022	0.188	0.594	1.19
PFUnA	2058-94-8	0.594	U	D0220-FS(0)	1.000	12/22/2022	0.185	0.594	1.19
PFDoA	307-55-1	0.594	U	D0220-FS(0)	1.000	12/22/2022	0.190	0.594	1.19
PFTrDA	72629-94-8	0.594	U	D0220-FS(0)	1.000	12/22/2022	0.191	0.594	1.19
PFTeDA	376-06-7	0.594	U	D0220-FS(0)	1.000	12/22/2022	0.192	0.594	2.38
NMeFOSAA	2355-31-9	0.594	U	D0220-FS(0)	1.000	12/22/2022	0.189	0.594	2.38
NEtFOSAA	2991-50-6	0.594	U	D0220-FS(0)	1.000	12/22/2022	0.196	0.594	2.38
PFBS	375-73-5	0.594	U	D0220-FS(0)	1.000	12/22/2022	0.203	0.594	1.19
PFHxS	355-46-4	0.594	U	D0220-FS(0)	1.000	12/22/2022	0.205	0.594	1.19
PFOS	1763-23-1	0.594	U	D0220-FS(0)	1.000	12/22/2022	0.208	0.594	1.19
HFPO-DA	13252-13-6	0.594	U	D0220-FS(0)	1.000	12/22/2022	0.189	0.594	2.38
Adona	919005-14-4	0.594	U	D0220-FS(0)	1.000	12/22/2022	0.190	0.594	2.38
9Cl-PF3ONS	756426-58-1	0.594	U	D0220-FS(0)	1.000	12/22/2022	0.183	0.594	2.38
11Cl-PF3OUdS	763051-92-9	0.594	U	D0220-FS(0)	1.000	12/22/2022	0.178	0.594	2.38

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-IDW10-SO-111522
Battelle ID	D0220-FS
Sample Type	SA
Collection Date	11/15/2022
Extraction Date	11/28/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS

Surrogate Recoveries (%)	**Recovery**	**Extract ID**	**Analysis Date**
13C5-PFHxA	71	D0220-FS(0)	12/22/2022
13C4-PFHpA	63	D0220-FS(0)	12/22/2022
13C8-PFOA	78	D0220-FS(0)	12/22/2022
13C9-PFNA	80	D0220-FS(0)	12/22/2022
13C6-PFDA	77	D0220-FS(0)	12/22/2022
13C7-PFUnA	75	D0220-FS(0)	12/22/2022
13C2-PFDoA	98	D0220-FS(0)	12/22/2022
13C2-PFTeDA	79	D0220-FS(0)	12/22/2022
d3-MeFOSAA	64	D0220-FS(0)	12/22/2022
d5-EtFOSAA	55	D0220-FS(0)	12/22/2022
13C3-PFBS	77	D0220-FS(0)	12/22/2022
13C3-PFHxS	64	D0220-FS(0)	12/22/2022
13C8-PFOS	78	D0220-FS(0)	12/22/2022
13C3-HFPO-DA	80	D0220-FS(0)	12/22/2022

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	LU50 IB
Battelle ID	LU50 IB_12/21/2022
Sample Type	IB
Collection Date	NA
Extraction Date	NA
Analysis Date	12/21/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	NA
Matrix	Solid
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)		DL	LOD	LOQ
PFHxA	307-24-4	0.500	U	0.178	0.500	1.00
PFHpA	375-85-9	0.500	U	0.168	0.500	1.00
PFOA	335-67-1	0.500	U	0.214	0.500	1.00
PFNA	375-95-1	0.500	U	0.157	0.500	1.00
PFDA	335-76-2	0.500	U	0.158	0.500	1.00
PFUnA	2058-94-8	0.500	U	0.156	0.500	1.00
PFDoA	307-55-1	0.500	U	0.160	0.500	1.00
PFTrDA	72629-94-8	0.500	U	0.161	0.500	1.00
PFTeDA	376-06-7	0.500	U	0.162	0.500	2.00
NMeFOSAA	2355-31-9	0.500	U	0.159	0.500	2.00
NEtFOSAA	2991-50-6	0.500	U	0.165	0.500	2.00
PFBS	375-73-5	0.500	U	0.171	0.500	1.00
PFHxS	355-46-4	0.500	U	0.173	0.500	1.00
PFOS	1763-23-1	0.500	U	0.175	0.500	1.00
HFPO-DA	13252-13-6	0.500	U	0.159	0.500	2.00
Adona	919005-14-4	0.500	U	0.160	0.500	2.00
9Cl-PF3ONS	756426-58-1	0.500	U	0.154	0.500	2.00
11Cl-PF3OUdS	763051-92-9	0.202	J	0.150	0.500	2.00

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	LU50 IB
Battelle ID	LU50 IB_12/21/2022
Sample Type	IB
Collection Date	NA
Extraction Date	NA
Analysis Date	12/21/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	NA
Matrix	Solid
Sample Size	5.000
Size Unit-Basis	g

Surrogate Recoveries (%)

13C5-PFHxA	104
13C4-PFHpA	94
13C8-PFOA	111
13C9-PFNA	115
13C6-PFDA	116
13C7-PFUnA	107
13C2-PFDoA	96
13C2-PFTeDA	96
d3-MeFOSAA	98
d5-EtFOSAA	91
13C3-PFBS	101
13C3-PFHxS	93
13C8-PFOS	103
13C3-HFPO-DA	111

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID		LU50 IB			
Battelle ID		LU50 IB_12/22/2022			
Sample Type		IB			
Collection Date		NA			
Extraction Date		NA			
Analysis Date		12/22/2022			
Analytical Instrument		Sciex 6500 (AD) LC/MS/MS			
% Moisture		NA			
Matrix		Solid			
Sample Size		5.000			
Size Unit-Basis		g			
Analyte	CAS No.	Result (ng/g_Dry)	DL	LOD	LOQ
PFHxA	307-24-4	-	-	-	-
PFHpA	375-85-9	-	-	-	-
PFOA	335-67-1	-	-	-	-
PFNA	375-95-1	-	-	-	-
PFDA	335-76-2	-	-	-	-
PFUnA	2058-94-8	-	-	-	-
PFDoA	307-55-1	-	-	-	-
PFTrDA	72629-94-8	-	-	-	-
PFTeDA	376-06-7	-	-	-	-
NMeFOSAA	2355-31-9	0.500 U	0.159	0.500	2.00
NEtFOSAA	2991-50-6	0.500 U	0.165	0.500	2.00
PFBS	375-73-5	-	-	-	-
PFHxS	355-46-4	-	-	-	-
PFOS	1763-23-1	-	-	-	-
HFPO-DA	13252-13-6	-	-	-	-
Adona	919005-14-4	-	-	-	-
9Cl-PF3ONS	756426-58-1	-	-	-	-
11Cl-PF3OUdS	763051-92-9	-	-	-	-

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	LU50 IB
Battelle ID	LU50 IB_12/22/2022
Sample Type	IB
Collection Date	NA
Extraction Date	NA
Analysis Date	12/22/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	NA
Matrix	Solid
Sample Size	5.000
Size Unit-Basis	g

Surrogate Recoveries (%)

13C5-PFHxA	-
13C4-PFHpA	-
13C8-PFOA	-
13C9-PFNA	-
13C6-PFDA	-
13C7-PFUnA	-
13C2-PFDoA	-
13C2-PFTeDA	-
d3-MeFOSAA	103
d5-EtFOSAA	104
13C3-PFBS	-
13C3-PFHxS	-
13C8-PFOS	-
13C3-HFPO-DA	-

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	220520-01: Ottawa Sand
Battelle ID	DL188PB-FS
Sample Type	PB
Collection Date	11/28/2022
Extraction Date	11/28/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	0.00
Matrix	SOLID
Sample Size	5.010
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	0.499 U	DL188PB-FS(0)	1.000	12/21/2022	0.178	0.499	0.998
PFHpA	375-85-9	0.499 U	DL188PB-FS(0)	1.000	12/21/2022	0.168	0.499	0.998
PFOA	335-67-1	0.499 U	DL188PB-FS(0)	1.000	12/21/2022	0.214	0.499	0.998
PFNA	375-95-1	0.499 U	DL188PB-FS(0)	1.000	12/21/2022	0.157	0.499	0.998
PFDA	335-76-2	0.499 U	DL188PB-FS(0)	1.000	12/21/2022	0.158	0.499	0.998
PFUnA	2058-94-8	0.499 U	DL188PB-FS(0)	1.000	12/21/2022	0.156	0.499	0.998
PFDoA	307-55-1	0.499 U	DL188PB-FS(0)	1.000	12/21/2022	0.160	0.499	0.998
PFTrDA	72629-94-8	0.499 U	DL188PB-FS(0)	1.000	12/21/2022	0.161	0.499	0.998
PFTeDA	376-06-7	0.499 U	DL188PB-FS(0)	1.000	12/21/2022	0.162	0.499	2.00
NMeFOSAA	2355-31-9	0.499 U	DL188PB-FS(0)	1.000	12/21/2022	0.159	0.499	2.00
NEtFOSAA	2991-50-6	0.499 U	DL188PB-FS(0)	1.000	12/21/2022	0.165	0.499	2.00
PFBS	375-73-5	0.499 U	DL188PB-FS(0)	1.000	12/21/2022	0.171	0.499	0.998
PFHxS	355-46-4	0.499 U	DL188PB-FS(0)	1.000	12/21/2022	0.173	0.499	0.998
PFOS	1763-23-1	0.499 U	DL188PB-FS(0)	1.000	12/21/2022	0.175	0.499	0.998
HFPO-DA	13252-13-6	0.499 U	DL188PB-FS(0)	1.000	12/21/2022	0.159	0.499	2.00
Adona	919005-14-4	0.499 U	DL188PB-FS(0)	1.000	12/21/2022	0.160	0.499	2.00
9Cl-PF3ONS	756426-58-1	0.499 U	DL188PB-FS(0)	1.000	12/21/2022	0.154	0.499	2.00
11Cl-PF3OUdS	763051-92-9	0.499 U	DL188PB-FS(0)	1.000	12/21/2022	0.150	0.499	2.00

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	220520-01: Ottawa Sand
Battelle ID	DL188PB-FS
Sample Type	PB
Collection Date	11/28/2022
Extraction Date	11/28/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS

Surrogate Recoveries (%)	**Recovery**	**Extract ID**	**Analysis Date**
13C5-PFHxA	66	DL188PB-FS(0)	12/21/2022
13C4-PFHpA	64	DL188PB-FS(0)	12/21/2022
13C8-PFOA	81	DL188PB-FS(0)	12/21/2022
13C9-PFNA	81	DL188PB-FS(0)	12/21/2022
13C6-PFDA	81	DL188PB-FS(0)	12/21/2022
13C7-PFUnA	83	DL188PB-FS(0)	12/21/2022
13C2-PFDoA	72	DL188PB-FS(0)	12/21/2022
13C2-PFTeDA	82	DL188PB-FS(0)	12/21/2022
d3-MeFOSAA	61	DL188PB-FS(0)	12/21/2022
d5-EtFOSAA	63	DL188PB-FS(0)	12/21/2022
13C3-PFBS	56	DL188PB-FS(0)	12/21/2022
13C3-PFHxS	72	DL188PB-FS(0)	12/21/2022
13C8-PFOS	68	DL188PB-FS(0)	12/21/2022
13C3-HFPO-DA	77	DL188PB-FS(0)	12/21/2022

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	220520-01: Ottawa Sand
Battelle ID	DL189LCS-FS
Sample Type	LCS
Collection Date	11/28/2022
Extraction Date	11/28/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	0.00
Matrix	SOLID
Sample Size	5.000
Size Unit-Basis	g

Analyte	CAS No.	Result (ng/g_Dry)	Extract ID	DF	Analysis Date	Target	Recovery	Qual	Control Limits Lower	Upper
PFHxA	307-24-4	12.1	DL189LCS-FS(0)	1.000	12/21/2022	10.0	121		70	132
PFHpA	375-85-9	11.6	DL189LCS-FS(0)	1.000	12/21/2022	10.0	116		71	131
PFOA	335-67-1	11.2	DL189LCS-FS(0)	1.000	12/21/2022	10.0	112		69	133
PFNA	375-95-1	13.9	DL189LCS-FS(0)	1.000	12/21/2022	10.0	139	N	72	129
PFDA	335-76-2	12.6	DL189LCS-FS(0)	1.000	12/21/2022	10.0	126		69	133
PFUnA	2058-94-8	15.0	DL189LCS-FS(0)	1.000	12/21/2022	10.0	150	N	64	136
PFDoA	307-55-1	11.6	DL189LCS-FS(0)	1.000	12/21/2022	10.0	116		69	135
PFTrDA	72629-94-8	13.2	DL189LCS-FS(0)	1.000	12/21/2022	10.0	132		66	139
PFTeDA	376-06-7	12.0	DL189LCS-FS(0)	1.000	12/21/2022	10.0	120		69	133
NMeFOSAA	2355-31-9	14.1	DL189LCS-FS(0)	1.000	12/21/2022	10.0	141		63	144
NEtFOSAA	2991-50-6	12.6	DL189LCS-FS(0)	1.000	12/21/2022	10.0	126		61	139
PFBS	375-73-5	12.7	DL189LCS-FS(0)	1.000	12/21/2022	10.0	127		72	128
PFHxS	355-46-4	11.3	DL189LCS-FS(0)	1.000	12/21/2022	10.0	113		67	130
PFOS	1763-23-1	12.4	DL189LCS-FS(0)	1.000	12/21/2022	10.0	124		68	136
HFPO-DA	13252-13-6	10.9	DL189LCS-FS(0)	1.000	12/21/2022	10.0	109		71	153
Adona	919005-14-4	11.8	DL189LCS-FS(0)	1.000	12/21/2022	10.0	118		61	139
9Cl-PF3ONS	756426-58-1	12.1	DL189LCS-FS(0)	1.000	12/21/2022	10.0	121		60	140
11Cl-PF3OUdS	763051-92-9	11.0	DL189LCS-FS(0)	1.000	12/21/2022	10.0	110		40	160

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	220520-01: Ottawa Sand
Battelle ID	DL189LCS-FS
Sample Type	LCS
Collection Date	11/28/2022
Extraction Date	11/28/2022
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS

Surrogate Recoveries (%)	Recovery	Extract ID	Analysis Date
13C5-PFHxA	66	DL189LCS-FS(0)	12/21/2022
13C4-PFHpA	70	DL189LCS-FS(0)	12/21/2022
13C8-PFOA	83	DL189LCS-FS(0)	12/21/2022
13C9-PFNA	75	DL189LCS-FS(0)	12/21/2022
13C6-PFDA	85	DL189LCS-FS(0)	12/21/2022
13C7-PFUnA	84	DL189LCS-FS(0)	12/21/2022
13C2-PFDoA	85	DL189LCS-FS(0)	12/21/2022
13C2-PFTeDA	86	DL189LCS-FS(0)	12/21/2022
d3-MeFOSAA	79	DL189LCS-FS(0)	12/21/2022
d5-EtFOSAA	76	DL189LCS-FS(0)	12/21/2022
13C3-PFBS	70	DL189LCS-FS(0)	12/21/2022
13C3-PFHxS	72	DL189LCS-FS(0)	12/21/2022
13C8-PFOS	68	DL189LCS-FS(0)	12/21/2022
13C3-HFPO-DA	79	DL189LCS-FS(0)	12/21/2022

BATTELLE
It can be done

Glossary of Data Qualifiers

Flag:	Application:
B	Analyte found in the sample at a concentration <10x the level found in the procedural blank
D	Dilution Run. Initial run outside the initial calibration range of the instrument
E	Estimate, result is greater than the highest concentration level in the calibration
J	Analyte detected below the Limit of Quantitation (LOQ)
MI	Significant Matrix Interference - value could not be determined.
N	Quality Control (QC) value is outside the accuracy or precision Data Quality Objective (DQO)
NA	Not Applicable
T	Holding Time (HT) exceeded
U	Analyte not detected or detected below the Detection Limit (DL) value, Limit of Detection (LOD) reported
Q	Ion ratio outside of criteria (50% difference from calibration expected ratio)

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Juan Acaron
Jacobs Engineering Group, Inc.
3011 SW Willston Road
Gainesville, Florida 32608-3964

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JOB DESCRIPTION

NBK Keyport

JOB NUMBER

410-106216-1

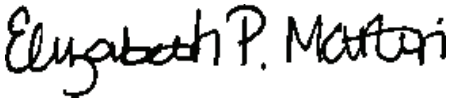
Eurofins Lancaster Laboratories Environment Testing, LLC
2425 New Holland Pike
Lancaster PA 17601

See page two for job notes and contact information.

Job Notes

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Authorization



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Authorized for release by
Elizabeth Martin, Project Manager
Elizabeth.Martin@et.eurofinsus.com
(717)205-3949

Compliance Statement

Analytical test results meet all requirements of the associated regulatory program (e.g., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis. Data qualifiers are applied to note exceptions. Noncompliant quality control (QC) is further explained in narrative comments.
· QC results that exceed the upper limits and are associated with non-detect samples are qualified but further narration is not required since the bias is high and does not change a non-detect result. Further narration is also not required with QC blank detection when the associated sample concentration is non-detect or more than ten times the level in the blank.
· Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD is performed, unless otherwise specified in the method.
· Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.
Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Measurement uncertainty values, as applicable, are available upon request.

Test results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" and tested in the laboratory are not performed within 15 minutes of collection.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. The foregoing express warranty is exclusive and is given in lieu of all other warranties, expressed or implied, except as otherwise agreed. We disclaim any other warranties, expressed or implied, including a warranty of fitness for particular purpose and warranty of merchantability. In no event shall Eurofins Lancaster Laboratories Environmental, LLC be liable for indirect, special, consequential, or incidental damages including, but not limited to, damages for loss of profit or goodwill regardless of (A) the negligence (either sole or concurrent) of Eurofins Lancaster Laboratories Environmental and (B) whether Eurofins Lancaster Laboratories Environmental has been informed of the possibility of such damages. We accept no legal responsibility for the purposes for which the client uses the test results. Except as otherwise agreed, no purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

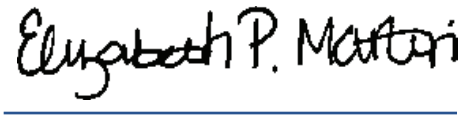

Table of Contents

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
M	Manual integrated compound.
U	Undetected at the Limit of Detection.

GC/MS Semi VOA

Qualifier	Qualifier Description
cn	Refer to Case Narrative for further detail
D	The reported value is from a dilution.
H	Sample was prepped or analyzed beyond the specified holding time
J	Estimated: The analyte was positively identified; the quantitation is an estimation
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
M	Manual integrated compound.
Q	One or more quality control criteria failed.
U	Undetected at the Limit of Detection.

GC VOA

Qualifier	Qualifier Description
cn	Refer to Case Narrative for further detail
D	The reported value is from a dilution.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
M	Manual integrated compound.
U	Undetected at the Limit of Detection.

GC Semi VOA

Qualifier	Qualifier Description
cn	Refer to Case Narrative for further detail
J	Estimated: The analyte was positively identified; the quantitation is an estimation
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
M	Manual integrated compound.
Q	One or more quality control criteria failed.
U	Undetected at the Limit of Detection.

Metals

Qualifier	Qualifier Description
D	The reported value is from a dilution.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
U	Undetected at the Limit of Detection.

General Chemistry

Qualifier	Qualifier Description
cn	Refer to Case Narrative for further detail
Q	One or more quality control criteria failed.
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
1C	Result is from the primary column on a dual-column method.
2C	Result is from the confirmation column on a dual-column method.
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)

Glossary (Continued)

Abbreviation	These commonly used abbreviations may or may not be present in this report.
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 410-106216-1

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC

Narrative

Job Narrative
410-106216-1

Receipt
The samples were received on 11/17/2022 10:05 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 4.1°C.

Receipt Exceptions
The container label for the following sample did not match the information listed on the Chain-of-Custody (COC): NBKK-IDW06-SO-111522 (410-106216-2). The container labels list collection time of 10:45, while the COC lists 11:45. Per client instruction 11/21/22 5:06 PM, the collection time of 10:45, listed on the container labels, is correct.

The container label for the following sample did not match the information listed on the Chain-of-Custody (COC): NBKK-IDW07-SO-111522 (410-106216-3). The container labels list the collection time as 11:45, while the COC lists 10:45. Per client instruction 11/21/22 5:06 PM, the collection time of 11:45, listed on the container labels, is correct.

GC/MS VOA
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

GC/MS Semi VOA
Method 8270E_DOD5: Surrogate recovery for the following sample was outside control limits: NBKK-IDW09-SO-111522 (410-106216-5). Re-extraction and/or re-analysis was performed outside of holding time with acceptable results. Both sets of data are reporting.

Method 8270E_SIM_DOD5: The following samples were diluted due to the nature of the sample matrix: NBKK-IDW07-SO-111522 (410-106216-3), NBKK-IDW08-SO-111522 (410-106216-4), NBKK-IDW09-SO-111522 (410-106216-5) and NBKK-IDW10-SO-111522 (410-106216-6). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

GC VOA
Method NWTPH_Gx: The value reported for C7-C12 may be due to carryover from the previous sample. The sample(s) were re-analyzed confirming carry over. The reported results are from both analysis.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

GC Semi VOA
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

PCBs
Method 8082A_DOD5: The DCB Decachlorobiphenyl (Surr) surrogate recovery for the following sample was outside acceptance limits (low biased) on the primary column: NBKK-IDW09-SO-111522 (410-106216-5). The recovery is within acceptance limits on the other column, indicating that the extraction process was in control.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Metals
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry
Method 1010A: The Pensky Martens closed cup apparatus is designed to determine the flash point of a liquid sample. The sample submitted could not be mixed well enough to obtain uniform heating. The temperature being measured was that of the material near the top of the cup. The material at the bottom of the cup could have a higher temperature. The temperature reported may not be accurate.

Job ID: 410-106216-1 (Continued)

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC (Continued)

Method 9012_ReactiveCN: The continuing calibration verification (CCV) associated with batch 410-322479 recovered above the upper control limit for cyanide. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Detection Summary

Client: Jacobs Engineering Group, Inc.
Project/Site: NBK Keyport

Job ID: 410-106216-1

Client Sample ID: NBKK-IDW05-SO-111522 — Lab Sample ID: 410-106216-1

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
C7-C12 (1C)	3.0	J D	6.1	0.61	0.28	mg/Kg	25	☼	NWTPH-Gx	Total/NA
Arsenic	3.3	D	0.38	0.30	0.13	mg/Kg	2	☼	6020B	Total/NA
Barium	46	D	0.38	0.34	0.17	mg/Kg	2	☼	6020B	Total/NA
Cadmium	0.12	D	0.094	0.075	0.038	mg/Kg	2	☼	6020B	Total/NA
Chromium	28	D	0.38	0.28	0.14	mg/Kg	2	☼	6020B	Total/NA
Copper	30	D	0.38	0.28	0.083	mg/Kg	2	☼	6020B	Total/NA
Lead	74	D	0.19	0.15	0.072	mg/Kg	2	☼	6020B	Total/NA
Nickel	29	D	0.38	0.30	0.15	mg/Kg	2	☼	6020B	Total/NA
Silver	0.044	J D	0.094	0.075	0.038	mg/Kg	2	☼	6020B	Total/NA
Zinc	71	D	28	7.5	3.8	mg/Kg	2	☼	6020B	Total/NA
Barium	450	J1	20	16	7.5	ug/L	1		6020B	TCLP
Cadmium	3.8	J J1	5.0	4.0	1.5	ug/L	1		6020B	TCLP
Chromium	7.1	J	20	8.0	3.3	ug/L	1		6020B	TCLP
Lead	1300	J1	5.0	2.0	0.71	ug/L	1		6020B	TCLP
Mercury	0.094	J J1	0.20	0.16	0.079	ug/L	1		7470A	TCLP
Mercury	0.037	J	0.067	0.045	0.022	mg/Kg	1	☼	7471B	Total/NA
Flashpoint	>201	cn	50.0	50.0	50.0	Degrees F	1		1010A	Total/NA

Client Sample ID: NBKK-IDW06-SO-111522 — Lab Sample ID: 410-106216-2

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Benzo[a]anthracene	0.0012	J	0.0020	0.0016	0.00081	mg/Kg	1	☼	8270E SIM	Total/NA
Benzo[b]fluoranthene	0.0013	J M	0.0020	0.0016	0.00081	mg/Kg	1	☼	8270E SIM	Total/NA
Chrysene	0.0012	J	0.0020	0.0016	0.00040	mg/Kg	1	☼	8270E SIM	Total/NA
Fluoranthene	0.0015	J	0.0020	0.0016	0.00081	mg/Kg	1	☼	8270E SIM	Total/NA
Phenanthrene	0.0015	J	0.0028	0.0024	0.0012	mg/Kg	1	☼	8270E SIM	Total/NA
Pyrene	0.0013	J	0.0020	0.0016	0.00081	mg/Kg	1	☼	8270E SIM	Total/NA
C7-C12 (1C)	1.6	J D	5.8	0.58	0.27	mg/Kg	25	☼	NWTPH-Gx	Total/NA
Arsenic	3.0	D	0.45	0.36	0.15	mg/Kg	2	☼	6020B	Total/NA
Barium	72	D	0.45	0.40	0.20	mg/Kg	2	☼	6020B	Total/NA
Cadmium	0.050	J D	0.11	0.089	0.045	mg/Kg	2	☼	6020B	Total/NA
Chromium	36	D	0.45	0.34	0.17	mg/Kg	2	☼	6020B	Total/NA
Copper	16	D	0.45	0.34	0.098	mg/Kg	2	☼	6020B	Total/NA
Lead	2.8	D	0.22	0.18	0.085	mg/Kg	2	☼	6020B	Total/NA
Nickel	45	D	0.45	0.36	0.18	mg/Kg	2	☼	6020B	Total/NA
Zinc	33	J D	34	8.9	4.5	mg/Kg	2	☼	6020B	Total/NA
Barium	250		20	16	7.5	ug/L	1		6020B	TCLP
Lead	2.5	J	5.0	2.0	0.71	ug/L	1		6020B	TCLP
Mercury	0.029	J	0.069	0.046	0.023	mg/Kg	1	☼	7471B	Total/NA
Flashpoint	>201	cn	50.0	50.0	50.0	Degrees F	1		1010A	Total/NA

Client Sample ID: NBKK-IDW07-SO-111522 — Lab Sample ID: 410-106216-3

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
C7-C12 (1C)	0.40	J D	5.3	0.53	0.24	mg/Kg	25	☼	NWTPH-Gx	Total/NA
C12-C24	6.3	J M	11	9.1	4.5	mg/Kg	1	☼	NWTPH-Dx	Total/NA
C24-C40	28	J M	34	23	11	mg/Kg	1	☼	NWTPH-Dx	Total/NA
Arsenic	1.8	D	0.34	0.27	0.11	mg/Kg	2	☼	6020B	Total/NA
Barium	38	D	0.34	0.30	0.15	mg/Kg	2	☼	6020B	Total/NA
Cadmium	0.067	J D	0.085	0.068	0.034	mg/Kg	2	☼	6020B	Total/NA
Chromium	20	D	0.34	0.25	0.13	mg/Kg	2	☼	6020B	Total/NA
Copper	10	D	0.34	0.25	0.074	mg/Kg	2	☼	6020B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: NBKK-IDW07-SO-111522 (Continued) — Lab Sample ID: 410-106216-3

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Lead	53	D	0.17	0.14	0.064	mg/Kg	2	☼	6020B	Total/NA
Nickel	39	D	0.34	0.27	0.14	mg/Kg	2	☼	6020B	Total/NA
Zinc	36	D	25	6.8	3.4	mg/Kg	2	☼	6020B	Total/NA
Barium	270		20	16	7.5	ug/L	1		6020B	TCLP
Chromium	9.7	J	20	8.0	3.3	ug/L	1		6020B	TCLP
Lead	840		5.0	2.0	0.71	ug/L	1		6020B	TCLP
Mercury	0.081	J	0.20	0.16	0.079	ug/L	1		7470A	TCLP
Mercury	0.034	J	0.068	0.045	0.023	mg/Kg	1	☼	7471B	Total/NA
Flashpoint	>201	cn	50.0	50.0	50.0	Degrees F	1		1010A	Total/NA

Client Sample ID: NBKK-IDW08-SO-111522 — Lab Sample ID: 410-106216-4

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
C7-C12 (1C)	0.82	J D	6.0	0.60	0.27	mg/Kg	25	☼	NWTPH-Gx	Total/NA
C12-C24	5.5	J M	13	10	5.1	mg/Kg	1	☼	NWTPH-Dx	Total/NA
C24-C40	15	J M	38	25	13	mg/Kg	1	☼	NWTPH-Dx	Total/NA
Arsenic	2.8	D	0.45	0.36	0.15	mg/Kg	2	☼	6020B	Total/NA
Barium	41	D	0.45	0.40	0.20	mg/Kg	2	☼	6020B	Total/NA
Cadmium	0.093	J D	0.11	0.089	0.045	mg/Kg	2	☼	6020B	Total/NA
Chromium	32	D	0.45	0.34	0.17	mg/Kg	2	☼	6020B	Total/NA
Copper	24	D	0.45	0.34	0.098	mg/Kg	2	☼	6020B	Total/NA
Lead	9.4	D	0.22	0.18	0.085	mg/Kg	2	☼	6020B	Total/NA
Nickel	44	D	0.45	0.36	0.18	mg/Kg	2	☼	6020B	Total/NA
Zinc	37	D	34	8.9	4.5	mg/Kg	2	☼	6020B	Total/NA
Barium	440		20	16	7.5	ug/L	1		6020B	TCLP
Chromium	3.6	J	20	8.0	3.3	ug/L	1		6020B	TCLP
Lead	1.8	J	5.0	2.0	0.71	ug/L	1		6020B	TCLP
Mercury	0.039	J	0.075	0.050	0.025	mg/Kg	1	☼	7471B	Total/NA
Flashpoint	>200	cn	50.0	50.0	50.0	Degrees F	1		1010A	Total/NA

Client Sample ID: NBKK-IDW09-SO-111522 — Lab Sample ID: 410-106216-5

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
1-Methylnaphthalene	0.011	D cn	0.0097	0.0078	0.0039	mg/Kg	5	☼	8270E SIM	Total/NA
2-Methylnaphthalene	0.011	J D M cn	0.019	0.016	0.0078	mg/Kg	5	☼	8270E SIM	Total/NA
Acenaphthene	0.019	D M cn	0.0097	0.0078	0.0039	mg/Kg	5	☼	8270E SIM	Total/NA
Acenaphthylene	0.0019	J D M cn	0.0097	0.0078	0.0019	mg/Kg	5	☼	8270E SIM	Total/NA
Anthracene	0.032	D cn	0.0097	0.0078	0.0039	mg/Kg	5	☼	8270E SIM	Total/NA
Benzo[a]anthracene	0.050	D cn	0.0097	0.0078	0.0039	mg/Kg	5	☼	8270E SIM	Total/NA
Benzo[a]pyrene	0.041	D M cn	0.0097	0.0078	0.0039	mg/Kg	5	☼	8270E SIM	Total/NA
Benzo[b]fluoranthene	0.038	D M cn	0.0097	0.0078	0.0039	mg/Kg	5	☼	8270E SIM	Total/NA
Benzo[g,h,i]perylene	0.028	D cn	0.0097	0.0078	0.0039	mg/Kg	5	☼	8270E SIM	Total/NA
Benzo[k]fluoranthene	0.011	D M cn	0.0097	0.0078	0.0039	mg/Kg	5	☼	8270E SIM	Total/NA
Chrysene	0.071	D cn	0.0097	0.0078	0.0019	mg/Kg	5	☼	8270E SIM	Total/NA
Dibenz(a,h)anthracene	0.0082	J D cn	0.0097	0.0078	0.0039	mg/Kg	5	☼	8270E SIM	Total/NA
Fluoranthene	0.077	D cn	0.0097	0.0078	0.0039	mg/Kg	5	☼	8270E SIM	Total/NA
Fluorene	0.015	D cn	0.0097	0.0078	0.0039	mg/Kg	5	☼	8270E SIM	Total/NA
Indeno[1,2,3-cd]pyrene	0.024	D cn	0.0097	0.0078	0.0039	mg/Kg	5	☼	8270E SIM	Total/NA
Phenanthrene	0.15	D cn	0.014	0.012	0.0058	mg/Kg	5	☼	8270E SIM	Total/NA
Pyrene	0.12	D M cn	0.0097	0.0078	0.0039	mg/Kg	5	☼	8270E SIM	Total/NA
C7-C12 (1C)	3.4	J D M	6.7	0.67	0.31	mg/Kg	25	☼	NWTPH-Gx	Total/NA
C12-C24	32	J1 M	12	9.3	4.6	mg/Kg	1	☼	NWTPH-Dx	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: NBKK-IDW09-SO-111522 (Continued)

Lab Sample ID: 410-106216-5

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
C24-C40	250	M	35	23	12	mg/Kg	1	☼	NWTPH-Dx	Total/NA
Arsenic	66	D	0.33	0.27	0.11	mg/Kg	2	☼	6020B	Total/NA
Barium	49	D	0.33	0.30	0.15	mg/Kg	2	☼	6020B	Total/NA
Cadmium	0.31	D	0.083	0.066	0.033	mg/Kg	2	☼	6020B	Total/NA
Chromium	22	D	0.33	0.25	0.13	mg/Kg	2	☼	6020B	Total/NA
Copper	18	D	0.33	0.25	0.073	mg/Kg	2	☼	6020B	Total/NA
Lead	11	D	0.17	0.13	0.063	mg/Kg	2	☼	6020B	Total/NA
Nickel	29	D	0.33	0.27	0.14	mg/Kg	2	☼	6020B	Total/NA
Selenium	0.11	J D	0.33	0.17	0.083	mg/Kg	2	☼	6020B	Total/NA
Silver	0.065	J D	0.083	0.066	0.034	mg/Kg	2	☼	6020B	Total/NA
Zinc	28	D	25	6.6	3.3	mg/Kg	2	☼	6020B	Total/NA
Barium	360		20	16	7.5	ug/L	1		6020B	TCLP
Lead	16		5.0	2.0	0.71	ug/L	1		6020B	TCLP
Mercury	0.049	J	0.070	0.047	0.023	mg/Kg	1	☼	7471B	Total/NA
Flashpoint	>200	cn	50.0	50.0	50.0	Degrees F	1		1010A	Total/NA

Client Sample ID: NBKK-IDW10-SO-111522

Lab Sample ID: 410-106216-6

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
C7-C12 (1C)	22	J D M cn	58	5.8	2.7	mg/Kg	200	☼	NWTPH-Gx	Total/NA
C7-C12 (1C)	0.38	J D	6.8	0.68	0.31	mg/Kg	25	☼	NWTPH-Gx	Total/NA
Arsenic	2.3	D	0.32	0.25	0.11	mg/Kg	2	☼	6020B	Total/NA
Barium	53	D	0.32	0.29	0.15	mg/Kg	2	☼	6020B	Total/NA
Cadmium	0.088	D	0.080	0.064	0.032	mg/Kg	2	☼	6020B	Total/NA
Chromium	24	D	0.32	0.24	0.12	mg/Kg	2	☼	6020B	Total/NA
Copper	11	D	0.32	0.24	0.070	mg/Kg	2	☼	6020B	Total/NA
Lead	3.5	D	0.16	0.13	0.061	mg/Kg	2	☼	6020B	Total/NA
Nickel	41	D	0.32	0.25	0.13	mg/Kg	2	☼	6020B	Total/NA
Zinc	26	D	24	6.4	3.2	mg/Kg	2	☼	6020B	Total/NA
Barium	300		20	16	7.5	ug/L	1		6020B	TCLP
Chromium	7.6	J	20	8.0	3.3	ug/L	1		6020B	TCLP
Lead	12		5.0	2.0	0.71	ug/L	1		6020B	TCLP
Mercury	0.089	J	0.20	0.16	0.079	ug/L	1		7470A	TCLP
Mercury	0.038	J	0.065	0.044	0.022	mg/Kg	1	☼	7471B	Total/NA
Flashpoint	>201	cn	50.0	50.0	50.0	Degrees F	1		1010A	Total/NA

This Detection Summary does not include radiochemical test results.

Client: Jacobs Engineering Group, Inc.
Project/Site: NBK Keyport

Job ID: 410-106216-1

Client Sample ID: NBKK-IDW05-SO-111522

Date Collected: 11/15/22 09:50
Date Received: 11/17/22 10:05

Lab Sample ID: 410-106216-1

Matrix: Solid
Percent Solids: 87.7

Method: SW846 8260D - Volatile Organic Compounds (GC/MS) - TCLP

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Benzene	12	U	20	12	6.0	ug/L		12/04/22 19:01	20
Carbon tetrachloride	12	U	20	12	6.0	ug/L		12/04/22 19:01	20
Chlorobenzene	12	U	20	12	6.0	ug/L		12/04/22 19:01	20
Chloroform	12	U	20	12	6.0	ug/L		12/04/22 19:01	20
1,2-Dichloroethane	12	U	20	12	6.0	ug/L		12/04/22 19:01	20
1,1-Dichloroethene	12	U	20	12	6.0	ug/L		12/04/22 19:01	20
2-Butanone	20	U	200	20	10	ug/L		12/04/22 19:01	20
Tetrachloroethene	12	U	20	12	6.0	ug/L		12/04/22 19:01	20
Trichloroethene	12	U	20	12	6.0	ug/L		12/04/22 19:01	20
Vinyl chloride	10	U	20	10	4.0	ug/L		12/04/22 19:01	20

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*102*		*81 - 118*		*12/04/22 19:01*	*20*
4-Bromofluorobenzene (Surr)	*92*		*85 - 114*		*12/04/22 19:01*	*20*
Dibromofluoromethane (Surr)	*100*		*80 - 119*		*12/04/22 19:01*	*20*
Toluene-d8 (Surr)	*100*		*89 - 112*		*12/04/22 19:01*	*20*

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
1-Methylnaphthalene	0.0030	U	0.0038	0.0030	0.0015	mg/Kg	☼	11/30/22 21:52	1
2-Methylnaphthalene	0.0060	U	0.0075	0.0060	0.0030	mg/Kg	☼	11/30/22 21:52	1
Acenaphthene	0.0030	U	0.0038	0.0030	0.0015	mg/Kg	☼	11/30/22 21:52	1
Acenaphthylene	0.0030	U	0.0038	0.0030	0.00075	mg/Kg	☼	11/30/22 21:52	1
Anthracene	0.0030	U	0.0038	0.0030	0.0015	mg/Kg	☼	11/30/22 21:52	1
Benzo[a]anthracene	0.0030	U M	0.0038	0.0030	0.0015	mg/Kg	☼	11/30/22 21:52	1
Benzo[a]pyrene	0.0030	U	0.0038	0.0030	0.0015	mg/Kg	☼	11/30/22 21:52	1
Benzo[b]fluoranthene	0.0030	U	0.0038	0.0030	0.0015	mg/Kg	☼	11/30/22 21:52	1
Benzo[g,h,i]perylene	0.0030	U	0.0038	0.0030	0.0015	mg/Kg	☼	11/30/22 21:52	1
Benzo[k]fluoranthene	0.0030	U	0.0038	0.0030	0.0015	mg/Kg	☼	11/30/22 21:52	1
Chrysene	0.0030	U	0.0038	0.0030	0.00075	mg/Kg	☼	11/30/22 21:52	1
Dibenz(a,h)anthracene	0.0030	U	0.0038	0.0030	0.0015	mg/Kg	☼	11/30/22 21:52	1
Fluoranthene	0.0030	U	0.0038	0.0030	0.0015	mg/Kg	☼	11/30/22 21:52	1
Fluorene	0.0030	U	0.0038	0.0030	0.0015	mg/Kg	☼	11/30/22 21:52	1
Indeno[1,2,3-cd]pyrene	0.0030	U	0.0038	0.0030	0.0015	mg/Kg	☼	11/30/22 21:52	1
Naphthalene	0.0060	U	0.0075	0.0060	0.0030	mg/Kg	☼	11/30/22 21:52	1
Phenanthrene	0.0045	U	0.0053	0.0045	0.0023	mg/Kg	☼	11/30/22 21:52	1
Pyrene	0.0030	U	0.0038	0.0030	0.0015	mg/Kg	☼	11/30/22 21:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Benzo(a)pyrene-d12 (Surr)	*69*		*19 - 133*	*11/29/22 15:15*	*11/30/22 21:52*	*1*
Fluoranthene-d10 (Surr)	*76*		*22 - 152*	*11/29/22 15:15*	*11/30/22 21:52*	*1*
1-Methylnaphthalene-d10 (Surr)	*75*		*26 - 123*	*11/29/22 15:15*	*11/30/22 21:52*	*1*

Method: SW846 8270E - Semivolatile Organic Compounds (GC/MS) - TCLP

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
1,4-Dichlorobenzene	0.0050	U J1	0.010	0.0050	0.0025	mg/L		12/07/22 17:58	1
2,4,5-Trichlorophenol	0.0050	U J1	0.010	0.0050	0.0025	mg/L		12/07/22 17:58	1
2,4,6-Trichlorophenol	0.0050	U J1	0.010	0.0050	0.0025	mg/L		12/07/22 17:58	1
2,4-Dinitrotoluene	0.010	U J1	0.025	0.010	0.0050	mg/L		12/07/22 17:58	1
2-Methylphenol	0.0050	U	0.010	0.0050	0.0025	mg/L		12/07/22 17:58	1

Client Sample ID: NBKK-IDW05-SO-111522

Date Collected: 11/15/22 09:50
Date Received: 11/17/22 10:05

Lab Sample ID: 410-106216-1

Matrix: Solid
Percent Solids: 87.7

Method: SW846 8270E - Semivolatile Organic Compounds (GC/MS) - TCLP (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
4-Methylphenol	0.0050	U	0.010	0.0050	0.0025	mg/L		12/07/22 17:58	1
Hexachlorobenzene	0.0011	U J1	0.0025	0.0011	0.00055	mg/L		12/07/22 17:58	1
Hexachlorobutadiene	0.0050	U J1	0.010	0.0050	0.0025	mg/L		12/07/22 17:58	1
Hexachloroethane	0.0050	U J1	0.025	0.0050	0.0025	mg/L		12/07/22 17:58	1
Nitrobenzene	0.0050	U M J1	0.010	0.0050	0.0025	mg/L		12/07/22 17:58	1
Pentachlorophenol	0.020	U J1	0.025	0.020	0.0050	mg/L		12/07/22 17:58	1
Pyridine	0.020	U	0.025	0.020	0.010	mg/L		12/07/22 17:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*93*		*43 - 140*	*12/07/22 07:57*	*12/07/22 17:58*	*1*
2-Fluorobiphenyl (Surr)	*86*		*44 - 119*	*12/07/22 07:57*	*12/07/22 17:58*	*1*
2-Fluorophenol (Surr)	*40*		*19 - 119*	*12/07/22 07:57*	*12/07/22 17:58*	*1*
Nitrobenzene-d5 (Surr)	*97*		*44 - 120*	*12/07/22 07:57*	*12/07/22 17:58*	*1*
p-Terphenyl-d14 (Surr)	*78*		*50 - 134*	*12/07/22 07:57*	*12/07/22 17:58*	*1*
Phenol-d5 (Surr)	*28*		*10 - 120*	*12/07/22 07:57*	*12/07/22 17:58*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
C7-C12 (1C)	**3.0**	**J D**	6.1	0.61	0.28	mg/Kg	☼	11/22/22 00:41	25

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*113*		*50 - 150*	*11/20/22 20:22*	*11/22/22 00:41*	*25*

Method: SW846 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
PCB-1016 (1C)	0.011	U	0.019	0.011	0.0060	mg/Kg	☼	11/29/22 20:22	1
PCB-1221 (1C)	0.011	U	0.019	0.011	0.0060	mg/Kg	☼	11/29/22 20:22	1
PCB-1232 (1C)	0.011	U	0.019	0.011	0.0060	mg/Kg	☼	11/29/22 20:22	1
PCB-1242 (1C)	0.011	U	0.019	0.011	0.0060	mg/Kg	☼	11/29/22 20:22	1
PCB-1248 (1C)	0.011	U M	0.019	0.011	0.0060	mg/Kg	☼	11/29/22 20:22	1
PCB-1254 (1C)	0.011	U M	0.019	0.011	0.0072	mg/Kg	☼	11/29/22 20:22	1
PCB-1260 (1C)	0.011	U	0.019	0.011	0.0072	mg/Kg	☼	11/29/22 20:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene (1C)	*89*		*44 - 130*	*11/29/22 09:14*	*11/29/22 20:22*	*1*
Tetrachloro-m-xylene (2C)	*90*		*44 - 130*	*11/29/22 09:14*	*11/29/22 20:22*	*1*
DCB Decachlorobiphenyl (Surr) (1C)	*85*		*66 - 130*	*11/29/22 09:14*	*11/29/22 20:22*	*1*
DCB Decachlorobiphenyl (Surr) (2C)	*93*		*66 - 130*	*11/29/22 09:14*	*11/29/22 20:22*	*1*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
C12-C24	9.1	U M	11	9.1	4.6	mg/Kg	☼	11/29/22 21:57	1
C24-C40	23	U M	34	23	11	mg/Kg	☼	11/29/22 21:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o- terphenyl (Surr)	*95*		*50 - 150*	*11/28/22 09:26*	*11/29/22 21:57*	*1*

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	**3.3**	**D**	0.38	0.30	0.13	mg/Kg	☼	12/06/22 18:24	2
Barium	**46**	**D**	0.38	0.34	0.17	mg/Kg	☼	12/06/22 18:24	2

Client Sample ID: NBKK-IDW05-SO-111522

Lab Sample ID: 410-106216-1
Date Collected: 11/15/22 09:50
Matrix: Solid
Date Received: 11/17/22 10:05
Percent Solids: 87.7

Method: SW846 6020B - Metals (ICP/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Cadmium	0.12	D	0.094	0.075	0.038	mg/Kg	☼	12/06/22 18:24	2
Chromium	28	D	0.38	0.28	0.14	mg/Kg	☼	12/06/22 18:24	2
Copper	30	D	0.38	0.28	0.083	mg/Kg	☼	12/06/22 18:24	2
Lead	74	D	0.19	0.15	0.072	mg/Kg	☼	12/06/22 18:24	2
Nickel	29	D	0.38	0.30	0.15	mg/Kg	☼	12/06/22 18:24	2
Selenium	0.19	U	0.38	0.19	0.094	mg/Kg	☼	12/06/22 18:24	2
Silver	0.044	J D	0.094	0.075	0.038	mg/Kg	☼	12/06/22 18:24	2
Zinc	71	D	28	7.5	3.8	mg/Kg	☼	12/06/22 18:24	2

Method: SW846 6020B - Metals (ICP/MS) - TCLP

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	17	U	20	17	6.8	ug/L		12/16/22 14:37	1
Barium	450	J1	20	16	7.5	ug/L		12/16/22 14:37	1
Cadmium	3.8	J J1	5.0	4.0	1.5	ug/L		12/16/22 14:37	1
Chromium	7.1	J	20	8.0	3.3	ug/L		12/16/22 14:37	1
Lead	1300	J1	5.0	2.0	0.71	ug/L		12/16/22 14:37	1
Selenium	6.0	U	10	6.0	2.8	ug/L		12/16/22 14:37	1
Silver	3.0	U J1	5.0	3.0	1.0	ug/L		12/16/22 14:37	1

Method: SW846 7470A - Mercury (CVAA) - TCLP

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	0.094	J J1	0.20	0.16	0.079	ug/L		12/04/22 13:35	1

Method: SW846 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	0.037	J	0.067	0.045	0.022	mg/Kg	☼	11/21/22 14:18	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Flashpoint (SW846 1010A)	>201	cn	50.0	50.0	50.0	Degrees F		11/26/22 06:35	1
Cyanide, Reactive (SW846 9012)	50	U	60	50	20	mg/Kg		11/30/22 17:15	1
Sulfide, Reactive (SW846 9034)	140	U	160	140	53	mg/Kg		11/30/22 13:10	1
Percent Moisture (EPA Moisture)	12.3		1.0		1.0	%		11/20/22 21:55	1
Percent Solids (EPA Moisture)	87.7		1.0		1.0	%		11/20/22 21:55	1

Client Sample ID: NBKK-IDW06-SO-111522

Lab Sample ID: 410-106216-2
Date Collected: 11/15/22 10:45
Matrix: Solid
Date Received: 11/17/22 10:05
Percent Solids: 82.1

Method: SW846 8260D - Volatile Organic Compounds (GC/MS) - TCLP

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Benzene	12	U	20	12	6.0	ug/L		12/04/22 19:21	20
Carbon tetrachloride	12	U	20	12	6.0	ug/L		12/04/22 19:21	20
Chlorobenzene	12	U	20	12	6.0	ug/L		12/04/22 19:21	20
Chloroform	12	U	20	12	6.0	ug/L		12/04/22 19:21	20
1,2-Dichloroethane	12	U	20	12	6.0	ug/L		12/04/22 19:21	20
1,1-Dichloroethene	12	U	20	12	6.0	ug/L		12/04/22 19:21	20
2-Butanone	20	U	200	20	10	ug/L		12/04/22 19:21	20
Tetrachloroethene	12	U	20	12	6.0	ug/L		12/04/22 19:21	20
Trichloroethene	12	U	20	12	6.0	ug/L		12/04/22 19:21	20
Vinyl chloride	10	U	20	10	4.0	ug/L		12/04/22 19:21	20

Client Sample ID: NBKK-IDW06-SO-111522

Date Collected: 11/15/22 10:45
Date Received: 11/17/22 10:05

Lab Sample ID: 410-106216-2

Matrix: Solid
Percent Solids: 82.1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	106		81 - 118		12/04/22 19:21	20
4-Bromofluorobenzene (Surr)	92		85 - 114		12/04/22 19:21	20
Dibromofluoromethane (Surr)	103		80 - 119		12/04/22 19:21	20
Toluene-d8 (Surr)	102		89 - 112		12/04/22 19:21	20

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
1-Methylnaphthalene	0.0016	U M	0.0020	0.0016	0.00081	mg/Kg	☼	11/30/22 22:16	1
2-Methylnaphthalene	0.0032	U M	0.0040	0.0032	0.0016	mg/Kg	☼	11/30/22 22:16	1
Acenaphthene	0.0016	U M	0.0020	0.0016	0.00081	mg/Kg	☼	11/30/22 22:16	1
Acenaphthylene	0.0016	U	0.0020	0.0016	0.00040	mg/Kg	☼	11/30/22 22:16	1
Anthracene	0.0016	U	0.0020	0.0016	0.00081	mg/Kg	☼	11/30/22 22:16	1
Benzo[a]anthracene	**0.0012**	**J**	0.0020	0.0016	0.00081	mg/Kg	☼	11/30/22 22:16	1
Benzo[a]pyrene	0.0016	U M	0.0020	0.0016	0.00081	mg/Kg	☼	11/30/22 22:16	1
Benzo[b]fluoranthene	**0.0013**	**J M**	0.0020	0.0016	0.00081	mg/Kg	☼	11/30/22 22:16	1
Benzo[g,h,i]perylene	0.0016	U	0.0020	0.0016	0.00081	mg/Kg	☼	11/30/22 22:16	1
Benzo[k]fluoranthene	0.0016	U M	0.0020	0.0016	0.00081	mg/Kg	☼	11/30/22 22:16	1
Chrysene	**0.0012**	**J**	0.0020	0.0016	0.00040	mg/Kg	☼	11/30/22 22:16	1
Dibenz(a,h)anthracene	0.0016	U	0.0020	0.0016	0.00081	mg/Kg	☼	11/30/22 22:16	1
Fluoranthene	**0.0015**	**J**	0.0020	0.0016	0.00081	mg/Kg	☼	11/30/22 22:16	1
Fluorene	0.0016	U M	0.0020	0.0016	0.00081	mg/Kg	☼	11/30/22 22:16	1
Indeno[1,2,3-cd]pyrene	0.0016	U	0.0020	0.0016	0.00081	mg/Kg	☼	11/30/22 22:16	1
Naphthalene	0.0032	U	0.0040	0.0032	0.0016	mg/Kg	☼	11/30/22 22:16	1
Phenanthrene	**0.0015**	**J**	0.0028	0.0024	0.0012	mg/Kg	☼	11/30/22 22:16	1
Pyrene	**0.0013**	**J**	0.0020	0.0016	0.00081	mg/Kg	☼	11/30/22 22:16	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Benzo(a)pyrene-d12 (Surr)	90		19 - 133	11/29/22 15:15	11/30/22 22:16	1
Fluoranthene-d10 (Surr)	83		22 - 152	11/29/22 15:15	11/30/22 22:16	1
1-Methylnaphthalene-d10 (Surr)	78		26 - 123	11/29/22 15:15	11/30/22 22:16	1

Method: SW846 8270E - Semivolatile Organic Compounds (GC/MS) - TCLP

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
1,4-Dichlorobenzene	0.0050	U	0.010	0.0050	0.0025	mg/L		12/07/22 19:01	1
2,4,5-Trichlorophenol	0.0050	U	0.010	0.0050	0.0025	mg/L		12/07/22 19:01	1
2,4,6-Trichlorophenol	0.0050	U	0.010	0.0050	0.0025	mg/L		12/07/22 19:01	1
2,4-Dinitrotoluene	0.010	U M	0.025	0.010	0.0050	mg/L		12/07/22 19:01	1
2-Methylphenol	0.0050	U	0.010	0.0050	0.0025	mg/L		12/07/22 19:01	1
4-Methylphenol	0.0050	U	0.010	0.0050	0.0025	mg/L		12/07/22 19:01	1
Hexachlorobenzene	0.0011	U	0.0025	0.0011	0.00055	mg/L		12/07/22 19:01	1
Hexachlorobutadiene	0.0050	U	0.010	0.0050	0.0025	mg/L		12/07/22 19:01	1
Hexachloroethane	0.0050	U	0.025	0.0050	0.0025	mg/L		12/07/22 19:01	1
Nitrobenzene	0.0050	U M	0.010	0.0050	0.0025	mg/L		12/07/22 19:01	1
Pentachlorophenol	0.020	U	0.025	0.020	0.0050	mg/L		12/07/22 19:01	1
Pyridine	0.020	U	0.025	0.020	0.010	mg/L		12/07/22 19:01	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol (Surr)	74		43 - 140	12/07/22 07:57	12/07/22 19:01	1
2-Fluorobiphenyl (Surr)	61		44 - 119	12/07/22 07:57	12/07/22 19:01	1
2-Fluorophenol (Surr)	41		19 - 119	12/07/22 07:57	12/07/22 19:01	1
Nitrobenzene-d5 (Surr)	67		44 - 120	12/07/22 07:57	12/07/22 19:01	1

Client Sample ID: NBKK-IDW06-SO-111522
Date Collected: 11/15/22 10:45
Date Received: 11/17/22 10:05

Lab Sample ID: 410-106216-2
Matrix: Solid
Percent Solids: 82.1

Method: SW846 8270E - Semivolatile Organic Compounds (GC/MS) - TCLP (Continued)

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
p-Terphenyl-d14 (Surr)	*80*		*50 - 134*	*12/07/22 07:57*	*12/07/22 19:01*	*1*
Phenol-d5 (Surr)	*30*		*10 - 120*	*12/07/22 07:57*	*12/07/22 19:01*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
C7-C12 (1C)	**1.6**	**J D**	5.8	0.58	0.27	mg/Kg	☼	11/22/22 01:17	25

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
a,a,a-Trifluorotoluene (fid) (1C)	*116*		*50 - 150*	*11/20/22 20:31*	*11/22/22 01:17*	*25*

Method: SW846 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
PCB-1016 (1C)	0.012	U	0.021	0.012	0.0064	mg/Kg	☼	11/29/22 20:33	1
PCB-1221 (1C)	0.012	U	0.021	0.012	0.0064	mg/Kg	☼	11/29/22 20:33	1
PCB-1232 (1C)	0.012	U	0.021	0.012	0.0064	mg/Kg	☼	11/29/22 20:33	1
PCB-1242 (1C)	0.012	U	0.021	0.012	0.0064	mg/Kg	☼	11/29/22 20:33	1
PCB-1248 (1C)	0.012	U	0.021	0.012	0.0064	mg/Kg	☼	11/29/22 20:33	1
PCB-1254 (1C)	0.012	U	0.021	0.012	0.0078	mg/Kg	☼	11/29/22 20:33	1
PCB-1260 (1C)	0.012	U M	0.021	0.012	0.0078	mg/Kg	☼	11/29/22 20:33	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Tetrachloro-m-xylene (1C)	*93*		*44 - 130*	*11/29/22 09:14*	*11/29/22 20:33*	*1*
Tetrachloro-m-xylene (2C)	*95*		*44 - 130*	*11/29/22 09:14*	*11/29/22 20:33*	*1*
DCB Decachlorobiphenyl (Surr) (1C)	*86*		*66 - 130*	*11/29/22 09:14*	*11/29/22 20:33*	*1*
DCB Decachlorobiphenyl (Surr) (2C)	*99*		*66 - 130*	*11/29/22 09:14*	*11/29/22 20:33*	*1*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
C12-C24	9.7	U M	12	9.7	4.8	mg/Kg	☼	11/29/22 22:17	1
C24-C40	24	U M	36	24	12	mg/Kg	☼	11/29/22 22:17	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o- terphenyl (Surr)	*101*		*50 - 150*	*11/28/22 09:26*	*11/29/22 22:17*	*1*

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	**3.0**	**D**	0.45	0.36	0.15	mg/Kg	☼	12/06/22 18:28	2
Barium	**72**	**D**	0.45	0.40	0.20	mg/Kg	☼	12/06/22 18:28	2
Cadmium	**0.050**	**J D**	0.11	0.089	0.045	mg/Kg	☼	12/06/22 18:28	2
Chromium	**36**	**D**	0.45	0.34	0.17	mg/Kg	☼	12/06/22 18:28	2
Copper	**16**	**D**	0.45	0.34	0.098	mg/Kg	☼	12/06/22 18:28	2
Lead	**2.8**	**D**	0.22	0.18	0.085	mg/Kg	☼	12/06/22 18:28	2
Nickel	**45**	**D**	0.45	0.36	0.18	mg/Kg	☼	12/06/22 18:28	2
Selenium	0.22	U	0.45	0.22	0.11	mg/Kg	☼	12/06/22 18:28	2
Silver	0.089	U	0.11	0.089	0.045	mg/Kg	☼	12/06/22 18:28	2
Zinc	**33**	**J D**	34	8.9	4.5	mg/Kg	☼	12/06/22 18:28	2

Method: SW846 6020B - Metals (ICP/MS) - TCLP

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	17	U	20	17	6.8	ug/L		12/09/22 08:40	1
Barium	**250**		20	16	7.5	ug/L		12/09/22 08:40	1

Client Sample ID: NBKK-IDW06-SO-111522

Lab Sample ID: 410-106216-2
Date Collected: 11/15/22 10:45
Matrix: Solid
Date Received: 11/17/22 10:05
Percent Solids: 82.1

Method: SW846 6020B - Metals (ICP/MS) - TCLP (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Cadmium	4.0	U	5.0	4.0	1.5	ug/L		12/09/22 08:40	1
Chromium	8.0	U	20	8.0	3.3	ug/L		12/09/22 08:40	1
Lead	**2.5**	**J**	5.0	2.0	0.71	ug/L		12/09/22 08:40	1
Selenium	6.0	U	10	6.0	2.8	ug/L		12/09/22 08:40	1
Silver	3.0	U	5.0	3.0	1.0	ug/L		12/09/22 08:40	1

Method: SW846 7470A - Mercury (CVAA) - TCLP

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	0.16	U	0.20	0.16	0.079	ug/L		12/04/22 15:02	1

Method: SW846 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	**0.029**	**J**	0.069	0.046	0.023	mg/Kg	☼	11/21/22 14:20	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Flashpoint (SW846 1010A)	**>201**	**cn**	50.0	50.0	50.0	Degrees F		11/26/22 06:35	1
Cyanide, Reactive (SW846 9012)	48	U	58	48	19	mg/Kg		11/30/22 17:16	1
Sulfide, Reactive (SW846 9034)	140	U	150	140	52	mg/Kg		11/30/22 13:10	1
Percent Moisture (EPA Moisture)	**17.9**		1.0		1.0	%		11/20/22 21:55	1
Percent Solids (EPA Moisture)	**82.1**		1.0		1.0	%		11/20/22 21:55	1

Client Sample ID: NBKK-IDW07-SO-111522

Lab Sample ID: 410-106216-3
Date Collected: 11/15/22 11:45
Matrix: Solid
Date Received: 11/17/22 10:05
Percent Solids: 86.9

Method: SW846 8260D - Volatile Organic Compounds (GC/MS) - TCLP

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Benzene	12	U	20	12	6.0	ug/L		12/04/22 19:41	20
Carbon tetrachloride	12	U	20	12	6.0	ug/L		12/04/22 19:41	20
Chlorobenzene	12	U	20	12	6.0	ug/L		12/04/22 19:41	20
Chloroform	12	U	20	12	6.0	ug/L		12/04/22 19:41	20
1,2-Dichloroethane	12	U	20	12	6.0	ug/L		12/04/22 19:41	20
1,1-Dichloroethene	12	U	20	12	6.0	ug/L		12/04/22 19:41	20
2-Butanone	20	U	200	20	10	ug/L		12/04/22 19:41	20
Tetrachloroethene	12	U	20	12	6.0	ug/L		12/04/22 19:41	20
Trichloroethene	12	U	20	12	6.0	ug/L		12/04/22 19:41	20
Vinyl chloride	10	U	20	10	4.0	ug/L		12/04/22 19:41	20

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*81 - 118*		*12/04/22 19:41*	*20*
4-Bromofluorobenzene (Surr)	*90*		*85 - 114*		*12/04/22 19:41*	*20*
Dibromofluoromethane (Surr)	*101*		*80 - 119*		*12/04/22 19:41*	*20*
Toluene-d8 (Surr)	*98*		*89 - 112*		*12/04/22 19:41*	*20*

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
1-Methylnaphthalene	0.046	U cn	0.057	0.046	0.023	mg/Kg	☼	11/30/22 22:39	5
2-Methylnaphthalene	0.092	U cn	0.11	0.092	0.046	mg/Kg	☼	11/30/22 22:39	5
Acenaphthene	0.046	U cn	0.057	0.046	0.023	mg/Kg	☼	11/30/22 22:39	5
Acenaphthylene	0.046	U cn	0.057	0.046	0.011	mg/Kg	☼	11/30/22 22:39	5

Client Sample ID: NBKK-IDW07-SO-111522
Date Collected: 11/15/22 11:45
Date Received: 11/17/22 10:05

Lab Sample ID: 410-106216-3
Matrix: Solid
Percent Solids: 86.9

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Anthracene	0.046	U cn	0.057	0.046	0.023	mg/Kg	☼	11/30/22 22:39	5
Benzo[a]anthracene	0.046	U cn	0.057	0.046	0.023	mg/Kg	☼	11/30/22 22:39	5
Benzo[a]pyrene	0.046	U cn	0.057	0.046	0.023	mg/Kg	☼	11/30/22 22:39	5
Benzo[b]fluoranthene	0.046	U cn	0.057	0.046	0.023	mg/Kg	☼	11/30/22 22:39	5
Benzo[g,h,i]perylene	0.046	U cn	0.057	0.046	0.023	mg/Kg	☼	11/30/22 22:39	5
Benzo[k]fluoranthene	0.046	U cn	0.057	0.046	0.023	mg/Kg	☼	11/30/22 22:39	5
Chrysene	0.046	U cn	0.057	0.046	0.011	mg/Kg	☼	11/30/22 22:39	5
Dibenz(a,h)anthracene	0.046	U cn	0.057	0.046	0.023	mg/Kg	☼	11/30/22 22:39	5
Fluoranthene	0.046	U cn	0.057	0.046	0.023	mg/Kg	☼	11/30/22 22:39	5
Fluorene	0.046	U cn	0.057	0.046	0.023	mg/Kg	☼	11/30/22 22:39	5
Indeno[1,2,3-cd]pyrene	0.046	U cn	0.057	0.046	0.023	mg/Kg	☼	11/30/22 22:39	5
Naphthalene	0.092	U cn	0.11	0.092	0.046	mg/Kg	☼	11/30/22 22:39	5
Phenanthrene	0.069	U cn	0.080	0.069	0.034	mg/Kg	☼	11/30/22 22:39	5
Pyrene	0.046	U cn	0.057	0.046	0.023	mg/Kg	☼	11/30/22 22:39	5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Benzo(a)pyrene-d12 (Surr)	*84*	*cn*	*19 - 133*	*11/29/22 15:15*	*11/30/22 22:39*	*5*
Fluoranthene-d10 (Surr)	*74*	*cn*	*22 - 152*	*11/29/22 15:15*	*11/30/22 22:39*	*5*
1-Methylnaphthalene-d10 (Surr)	*76*	*cn*	*26 - 123*	*11/29/22 15:15*	*11/30/22 22:39*	*5*

Method: SW846 8270E - Semivolatile Organic Compounds (GC/MS) - TCLP

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
1,4-Dichlorobenzene	0.0050	U	0.010	0.0050	0.0025	mg/L		12/07/22 19:22	1
2,4,5-Trichlorophenol	0.0050	U	0.010	0.0050	0.0025	mg/L		12/07/22 19:22	1
2,4,6-Trichlorophenol	0.0050	U	0.010	0.0050	0.0025	mg/L		12/07/22 19:22	1
2,4-Dinitrotoluene	0.010	U	0.025	0.010	0.0050	mg/L		12/07/22 19:22	1
2-Methylphenol	0.0050	U	0.010	0.0050	0.0025	mg/L		12/07/22 19:22	1
4-Methylphenol	0.0050	U	0.010	0.0050	0.0025	mg/L		12/07/22 19:22	1
Hexachlorobenzene	0.0011	U	0.0025	0.0011	0.00055	mg/L		12/07/22 19:22	1
Hexachlorobutadiene	0.0050	U	0.010	0.0050	0.0025	mg/L		12/07/22 19:22	1
Hexachloroethane	0.0050	U	0.025	0.0050	0.0025	mg/L		12/07/22 19:22	1
Nitrobenzene	0.0050	U M	0.010	0.0050	0.0025	mg/L		12/07/22 19:22	1
Pentachlorophenol	0.020	U	0.025	0.020	0.0050	mg/L		12/07/22 19:22	1
Pyridine	0.020	U	0.025	0.020	0.010	mg/L		12/07/22 19:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*95*		*43 - 140*	*12/07/22 07:57*	*12/07/22 19:22*	*1*
2-Fluorobiphenyl (Surr)	*83*		*44 - 119*	*12/07/22 07:57*	*12/07/22 19:22*	*1*
2-Fluorophenol (Surr)	*39*		*19 - 119*	*12/07/22 07:57*	*12/07/22 19:22*	*1*
Nitrobenzene-d5 (Surr)	*92*		*44 - 120*	*12/07/22 07:57*	*12/07/22 19:22*	*1*
p-Terphenyl-d14 (Surr)	*86*		*50 - 134*	*12/07/22 07:57*	*12/07/22 19:22*	*1*
Phenol-d5 (Surr)	*27*		*10 - 120*	*12/07/22 07:57*	*12/07/22 19:22*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
C7-C12 (1C)	**0.40**	**J D**	5.3	0.53	0.24	mg/Kg	☼	11/22/22 02:01	25

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*108*		*50 - 150*	*11/20/22 20:31*	*11/22/22 02:01*	*25*

Client: Jacobs Engineering Group, Inc.
Project/Site: NBK Keyport

Job ID: 410-106216-1

Client Sample ID: NBKK-IDW07-SO-111522

Date Collected: 11/15/22 11:45
Date Received: 11/17/22 10:05

Lab Sample ID: 410-106216-3

Matrix: Solid
Percent Solids: 86.9

Method: SW846 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
PCB-1016 (1C)	0.011	U	0.019	0.011	0.0060	mg/Kg	☼	11/29/22 20:43	1
PCB-1221 (1C)	0.011	U	0.019	0.011	0.0060	mg/Kg	☼	11/29/22 20:43	1
PCB-1232 (1C)	0.011	U	0.019	0.011	0.0060	mg/Kg	☼	11/29/22 20:43	1
PCB-1242 (1C)	0.011	U	0.019	0.011	0.0060	mg/Kg	☼	11/29/22 20:43	1
PCB-1248 (1C)	0.011	U M	0.019	0.011	0.0060	mg/Kg	☼	11/29/22 20:43	1
PCB-1254 (1C)	0.011	U M	0.019	0.011	0.0073	mg/Kg	☼	11/29/22 20:43	1
PCB-1260 (1C)	0.011	U M	0.019	0.011	0.0073	mg/Kg	☼	11/29/22 20:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene (1C)	*85*		*44 - 130*	*11/29/22 09:14*	*11/29/22 20:43*	*1*
Tetrachloro-m-xylene (2C)	*87*		*44 - 130*	*11/29/22 09:14*	*11/29/22 20:43*	*1*
DCB Decachlorobiphenyl (Surr) (1C)	*77*		*66 - 130*	*11/29/22 09:14*	*11/29/22 20:43*	*1*
DCB Decachlorobiphenyl (Surr) (2C)	*97*		*66 - 130*	*11/29/22 09:14*	*11/29/22 20:43*	*1*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
C12-C24	**6.3**	**J M**	11	9.1	4.5	mg/Kg	☼	11/29/22 22:56	1
C24-C40	**28**	**J M**	34	23	11	mg/Kg	☼	11/29/22 22:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o- terphenyl (Surr)	*98*		*50 - 150*	*11/28/22 09:26*	*11/29/22 22:56*	*1*

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	**1.8**	**D**	0.34	0.27	0.11	mg/Kg	☼	12/06/22 18:50	2
Barium	**38**	**D**	0.34	0.30	0.15	mg/Kg	☼	12/06/22 18:50	2
Cadmium	**0.067**	**J D**	0.085	0.068	0.034	mg/Kg	☼	12/06/22 18:50	2
Chromium	**20**	**D**	0.34	0.25	0.13	mg/Kg	☼	12/06/22 18:50	2
Copper	**10**	**D**	0.34	0.25	0.074	mg/Kg	☼	12/06/22 18:50	2
Lead	**53**	**D**	0.17	0.14	0.064	mg/Kg	☼	12/06/22 18:50	2
Nickel	**39**	**D**	0.34	0.27	0.14	mg/Kg	☼	12/06/22 18:50	2
Selenium	0.17	U	0.34	0.17	0.085	mg/Kg	☼	12/06/22 18:50	2
Silver	0.068	U	0.085	0.068	0.034	mg/Kg	☼	12/06/22 18:50	2
Zinc	**36**	**D**	25	6.8	3.4	mg/Kg	☼	12/06/22 18:50	2

Method: SW846 6020B - Metals (ICP/MS) - TCLP

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	17	U	20	17	6.8	ug/L		12/16/22 14:55	1
Barium	**270**		20	16	7.5	ug/L		12/16/22 14:55	1
Cadmium	4.0	U	5.0	4.0	1.5	ug/L		12/16/22 14:55	1
Chromium	**9.7**	**J**	20	8.0	3.3	ug/L		12/16/22 14:55	1
Lead	**840**		5.0	2.0	0.71	ug/L		12/16/22 14:55	1
Selenium	6.0	U	10	6.0	2.8	ug/L		12/16/22 14:55	1
Silver	3.0	U	5.0	3.0	1.0	ug/L		12/16/22 14:55	1

Method: SW846 7470A - Mercury (CVAA) - TCLP

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	**0.081**	**J**	0.20	0.16	0.079	ug/L		12/04/22 13:45	1

Client Sample ID: NBKK-IDW07-SO-111522

Lab Sample ID: 410-106216-3
Date Collected: 11/15/22 11:45
Matrix: Solid
Date Received: 11/17/22 10:05
Percent Solids: 86.9

Method: SW846 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	**0.034**	**J**	0.068	0.045	0.023	mg/Kg	☼	11/21/22 14:22	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Flashpoint (SW846 1010A)	**>201**	**cn**	50.0	50.0	50.0	Degrees F		11/26/22 06:35	1
Cyanide, Reactive (SW846 9012)	49	U	59	49	20	mg/Kg		11/30/22 17:17	1
Sulfide, Reactive (SW846 9034)	140	U	160	140	53	mg/Kg		11/30/22 13:10	1
Percent Moisture (EPA Moisture)	**13.1**		1.0		1.0	%		11/20/22 21:55	1
Percent Solids (EPA Moisture)	**86.9**		1.0		1.0	%		11/20/22 21:55	1

Client Sample ID: NBKK-IDW08-SO-111522

Lab Sample ID: 410-106216-4
Date Collected: 11/15/22 13:15
Matrix: Solid
Date Received: 11/17/22 10:05
Percent Solids: 79.2

Method: SW846 8260D - Volatile Organic Compounds (GC/MS) - TCLP

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Benzene	12	U	20	12	6.0	ug/L		12/04/22 20:01	20
Carbon tetrachloride	12	U	20	12	6.0	ug/L		12/04/22 20:01	20
Chlorobenzene	12	U	20	12	6.0	ug/L		12/04/22 20:01	20
Chloroform	12	U	20	12	6.0	ug/L		12/04/22 20:01	20
1,2-Dichloroethane	12	U	20	12	6.0	ug/L		12/04/22 20:01	20
1,1-Dichloroethene	12	U	20	12	6.0	ug/L		12/04/22 20:01	20
2-Butanone	20	U M	200	20	10	ug/L		12/04/22 20:01	20
Tetrachloroethene	12	U	20	12	6.0	ug/L		12/04/22 20:01	20
Trichloroethene	12	U	20	12	6.0	ug/L		12/04/22 20:01	20
Vinyl chloride	10	U	20	10	4.0	ug/L		12/04/22 20:01	20

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*81 - 118*		*12/04/22 20:01*	*20*
4-Bromofluorobenzene (Surr)	*92*		*85 - 114*		*12/04/22 20:01*	*20*
Dibromofluoromethane (Surr)	*101*		*80 - 119*		*12/04/22 20:01*	*20*
Toluene-d8 (Surr)	*102*		*89 - 112*		*12/04/22 20:01*	*20*

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
1-Methylnaphthalene	0.050	U cn	0.062	0.050	0.025	mg/Kg	☼	11/30/22 23:50	5
2-Methylnaphthalene	0.10	U cn	0.12	0.10	0.050	mg/Kg	☼	11/30/22 23:50	5
Acenaphthene	0.050	U cn	0.062	0.050	0.025	mg/Kg	☼	11/30/22 23:50	5
Acenaphthylene	0.050	U cn	0.062	0.050	0.012	mg/Kg	☼	11/30/22 23:50	5
Anthracene	0.050	U cn	0.062	0.050	0.025	mg/Kg	☼	11/30/22 23:50	5
Benzo[a]anthracene	0.050	U M cn	0.062	0.050	0.025	mg/Kg	☼	11/30/22 23:50	5
Benzo[a]pyrene	0.050	U cn	0.062	0.050	0.025	mg/Kg	☼	11/30/22 23:50	5
Benzo[b]fluoranthene	0.050	U M cn	0.062	0.050	0.025	mg/Kg	☼	11/30/22 23:50	5
Benzo[g,h,i]perylene	0.050	U cn	0.062	0.050	0.025	mg/Kg	☼	11/30/22 23:50	5
Benzo[k]fluoranthene	0.050	U M cn	0.062	0.050	0.025	mg/Kg	☼	11/30/22 23:50	5
Chrysene	0.050	U cn	0.062	0.050	0.012	mg/Kg	☼	11/30/22 23:50	5
Dibenz(a,h)anthracene	0.050	U cn	0.062	0.050	0.025	mg/Kg	☼	11/30/22 23:50	5
Fluoranthene	0.050	U cn	0.062	0.050	0.025	mg/Kg	☼	11/30/22 23:50	5
Fluorene	0.050	U cn	0.062	0.050	0.025	mg/Kg	☼	11/30/22 23:50	5
Indeno[1,2,3-cd]pyrene	0.050	U cn	0.062	0.050	0.025	mg/Kg	☼	11/30/22 23:50	5
Naphthalene	0.10	U cn	0.12	0.10	0.050	mg/Kg	☼	11/30/22 23:50	5

Client Sample ID: NBKK-IDW08-SO-111522

Date Collected: 11/15/22 13:15
Date Received: 11/17/22 10:05

Lab Sample ID: 410-106216-4

Matrix: Solid
Percent Solids: 79.2

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Phenanthrene	0.075	U cn	0.087	0.075	0.037	mg/Kg	☼	11/30/22 23:50	5
Pyrene	0.050	U cn	0.062	0.050	0.025	mg/Kg	☼	11/30/22 23:50	5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Benzo(a)pyrene-d12 (Surr)	*85*	*cn*	*19 - 133*	*11/29/22 15:15*	*11/30/22 23:50*	*5*
Fluoranthene-d10 (Surr)	*77*	*cn*	*22 - 152*	*11/29/22 15:15*	*11/30/22 23:50*	*5*
1-Methylnaphthalene-d10 (Surr)	*78*	*cn*	*26 - 123*	*11/29/22 15:15*	*11/30/22 23:50*	*5*

Method: SW846 8270E - Semivolatile Organic Compounds (GC/MS) - TCLP

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
1,4-Dichlorobenzene	0.0050	U	0.010	0.0050	0.0025	mg/L		12/07/22 19:43	1
2,4,5-Trichlorophenol	0.0050	U	0.010	0.0050	0.0025	mg/L		12/07/22 19:43	1
2,4,6-Trichlorophenol	0.0050	U	0.010	0.0050	0.0025	mg/L		12/07/22 19:43	1
2,4-Dinitrotoluene	0.010	U M	0.025	0.010	0.0050	mg/L		12/07/22 19:43	1
2-Methylphenol	0.0050	U	0.010	0.0050	0.0025	mg/L		12/07/22 19:43	1
4-Methylphenol	0.0050	U	0.010	0.0050	0.0025	mg/L		12/07/22 19:43	1
Hexachlorobenzene	0.0011	U	0.0025	0.0011	0.00055	mg/L		12/07/22 19:43	1
Hexachlorobutadiene	0.0050	U	0.010	0.0050	0.0025	mg/L		12/07/22 19:43	1
Hexachloroethane	0.0050	U	0.025	0.0050	0.0025	mg/L		12/07/22 19:43	1
Nitrobenzene	0.0050	U M	0.010	0.0050	0.0025	mg/L		12/07/22 19:43	1
Pentachlorophenol	0.020	U	0.025	0.020	0.0050	mg/L		12/07/22 19:43	1
Pyridine	0.020	U	0.025	0.020	0.010	mg/L		12/07/22 19:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*92*		*43 - 140*	*12/07/22 07:57*	*12/07/22 19:43*	*1*
2-Fluorobiphenyl (Surr)	*84*		*44 - 119*	*12/07/22 07:57*	*12/07/22 19:43*	*1*
2-Fluorophenol (Surr)	*52*		*19 - 119*	*12/07/22 07:57*	*12/07/22 19:43*	*1*
Nitrobenzene-d5 (Surr)	*98*		*44 - 120*	*12/07/22 07:57*	*12/07/22 19:43*	*1*
p-Terphenyl-d14 (Surr)	*112*		*50 - 134*	*12/07/22 07:57*	*12/07/22 19:43*	*1*
Phenol-d5 (Surr)	*36*		*10 - 120*	*12/07/22 07:57*	*12/07/22 19:43*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
C7-C12 (1C)	**0.82**	**J D**	6.0	0.60	0.27	mg/Kg	☼	11/22/22 02:37	25

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*145*		*50 - 150*	*11/20/22 20:31*	*11/22/22 02:37*	*25*

Method: SW846 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
PCB-1016 (1C)	0.013	U M	0.021	0.013	0.0067	mg/Kg	☼	11/29/22 20:54	1
PCB-1221 (1C)	0.013	U	0.021	0.013	0.0067	mg/Kg	☼	11/29/22 20:54	1
PCB-1232 (1C)	0.013	U M	0.021	0.013	0.0067	mg/Kg	☼	11/29/22 20:54	1
PCB-1242 (1C)	0.013	U M	0.021	0.013	0.0067	mg/Kg	☼	11/29/22 20:54	1
PCB-1248 (1C)	0.013	U M	0.021	0.013	0.0067	mg/Kg	☼	11/29/22 20:54	1
PCB-1254 (1C)	0.013	U M	0.021	0.013	0.0081	mg/Kg	☼	11/29/22 20:54	1
PCB-1260 (1C)	0.013	U M	0.021	0.013	0.0081	mg/Kg	☼	11/29/22 20:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene (1C)	*92*		*44 - 130*	*11/29/22 09:14*	*11/29/22 20:54*	*1*
Tetrachloro-m-xylene (2C)	*91*		*44 - 130*	*11/29/22 09:14*	*11/29/22 20:54*	*1*

Client Sample ID: NBKK-IDW08-SO-111522
Date Collected: 11/15/22 13:15
Date Received: 11/17/22 10:05

Lab Sample ID: 410-106216-4
Matrix: Solid
Percent Solids: 79.2

Method: SW846 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography (Continued)

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl (Surr) (1C)	82		66 - 130	11/29/22 09:14	11/29/22 20:54	1
DCB Decachlorobiphenyl (Surr) (2C)	97		66 - 130	11/29/22 09:14	11/29/22 20:54	1

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
C12-C24	5.5	J M	13	10	5.1	mg/Kg	☼	11/29/22 23:16	1
C24-C40	15	J M	38	25	13	mg/Kg	☼	11/29/22 23:16	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o- terphenyl (Surr)	98		50 - 150	11/28/22 09:26	11/29/22 23:16	1

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	2.8	D	0.45	0.36	0.15	mg/Kg	☼	12/06/22 18:46	2
Barium	41	D	0.45	0.40	0.20	mg/Kg	☼	12/06/22 18:46	2
Cadmium	0.093	J D	0.11	0.089	0.045	mg/Kg	☼	12/06/22 18:46	2
Chromium	32	D	0.45	0.34	0.17	mg/Kg	☼	12/06/22 18:46	2
Copper	24	D	0.45	0.34	0.098	mg/Kg	☼	12/06/22 18:46	2
Lead	9.4	D	0.22	0.18	0.085	mg/Kg	☼	12/06/22 18:46	2
Nickel	44	D	0.45	0.36	0.18	mg/Kg	☼	12/06/22 18:46	2
Selenium	0.22	U	0.45	0.22	0.11	mg/Kg	☼	12/06/22 18:46	2
Silver	0.089	U	0.11	0.089	0.045	mg/Kg	☼	12/06/22 18:46	2
Zinc	37	D	34	8.9	4.5	mg/Kg	☼	12/06/22 18:46	2

Method: SW846 6020B - Metals (ICP/MS) - TCLP

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	17	U	20	17	6.8	ug/L		12/16/22 14:57	1
Barium	440		20	16	7.5	ug/L		12/16/22 14:57	1
Cadmium	4.0	U	5.0	4.0	1.5	ug/L		12/16/22 14:57	1
Chromium	3.6	J	20	8.0	3.3	ug/L		12/16/22 14:57	1
Lead	1.8	J	5.0	2.0	0.71	ug/L		12/16/22 14:57	1
Selenium	6.0	U	10	6.0	2.8	ug/L		12/16/22 14:57	1
Silver	3.0	U	5.0	3.0	1.0	ug/L		12/16/22 14:57	1

Method: SW846 7470A - Mercury (CVAA) - TCLP

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	0.16	U	0.20	0.16	0.079	ug/L		12/04/22 13:47	1

Method: SW846 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	0.039	J	0.075	0.050	0.025	mg/Kg	☼	11/21/22 14:24	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Flashpoint (SW846 1010A)	>200	cn	50.0	50.0	50.0	Degrees F		11/26/22 06:35	1
Cyanide, Reactive (SW846 9012)	50	U Q cn	59	50	20	mg/Kg		11/30/22 17:22	1
Sulfide, Reactive (SW846 9034)	140	U cn	160	140	53	mg/Kg		11/30/22 13:10	1
Percent Moisture (EPA Moisture)	20.8		1.0		1.0	%		11/20/22 21:55	1
Percent Solids (EPA Moisture)	79.2		1.0		1.0	%		11/20/22 21:55	1

Client: Jacobs Engineering Group, Inc.
Project/Site: NBK Keyport

Job ID: 410-106216-1

Client Sample ID: NBKK-IDW09-SO-111522

Date Collected: 11/15/22 14:00
Date Received: 11/17/22 10:05

Lab Sample ID: 410-106216-5

Matrix: Solid

Method: SW846 8260D - Volatile Organic Compounds (GC/MS) - TCLP

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Benzene	12	U	20	12	6.0	ug/L		12/04/22 20:21	20
Carbon tetrachloride	12	U	20	12	6.0	ug/L		12/04/22 20:21	20
Chlorobenzene	12	U	20	12	6.0	ug/L		12/04/22 20:21	20
Chloroform	12	U	20	12	6.0	ug/L		12/04/22 20:21	20
1,2-Dichloroethane	12	U	20	12	6.0	ug/L		12/04/22 20:21	20
1,1-Dichloroethene	12	U	20	12	6.0	ug/L		12/04/22 20:21	20
2-Butanone	20	U	200	20	10	ug/L		12/04/22 20:21	20
Tetrachloroethene	12	U	20	12	6.0	ug/L		12/04/22 20:21	20
Trichloroethene	12	U	20	12	6.0	ug/L		12/04/22 20:21	20
Vinyl chloride	10	U	20	10	4.0	ug/L		12/04/22 20:21	20

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*103*		*81 - 118*		*12/04/22 20:21*	*20*
4-Bromofluorobenzene (Surr)	*94*		*85 - 114*		*12/04/22 20:21*	*20*
Dibromofluoromethane (Surr)	*103*		*80 - 119*		*12/04/22 20:21*	*20*
Toluene-d8 (Surr)	*103*		*89 - 112*		*12/04/22 20:21*	*20*

Method: SW846 8270E - Semivolatile Organic Compounds (GC/MS) - TCLP

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
1,4-Dichlorobenzene	0.010	U cn	0.020	0.010	0.0050	mg/L		12/07/22 20:04	1
2,4,5-Trichlorophenol	0.010	U cn	0.020	0.010	0.0050	mg/L		12/07/22 20:04	1
2,4,6-Trichlorophenol	0.010	U cn	0.020	0.010	0.0050	mg/L		12/07/22 20:04	1
2,4-Dinitrotoluene	0.020	U M cn	0.050	0.020	0.010	mg/L		12/07/22 20:04	1
2-Methylphenol	0.010	U cn	0.020	0.010	0.0050	mg/L		12/07/22 20:04	1
4-Methylphenol	0.010	U cn	0.020	0.010	0.0050	mg/L		12/07/22 20:04	1
Hexachlorobenzene	0.0022	U cn	0.0050	0.0022	0.0011	mg/L		12/07/22 20:04	1
Hexachlorobutadiene	0.010	U cn	0.020	0.010	0.0050	mg/L		12/07/22 20:04	1
Hexachloroethane	0.010	U cn	0.050	0.010	0.0050	mg/L		12/07/22 20:04	1
Nitrobenzene	0.010	U cn	0.020	0.010	0.0050	mg/L		12/07/22 20:04	1
Pentachlorophenol	0.040	U cn	0.050	0.040	0.010	mg/L		12/07/22 20:04	1
Pyridine	0.040	U cn	0.050	0.040	0.020	mg/L		12/07/22 20:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*0.2*	*Q cn*	*43 - 140*	*12/07/22 07:57*	*12/07/22 20:04*	*1*
2-Fluorobiphenyl (Surr)	*0.05*	*Q cn*	*44 - 119*	*12/07/22 07:57*	*12/07/22 20:04*	*1*
2-Fluorophenol (Surr)	*0*	*Q cn*	*19 - 119*	*12/07/22 07:57*	*12/07/22 20:04*	*1*
Nitrobenzene-d5 (Surr)	*0.1*	*Q cn*	*44 - 120*	*12/07/22 07:57*	*12/07/22 20:04*	*1*
p-Terphenyl-d14 (Surr)	*0.9*	*Q cn*	*50 - 134*	*12/07/22 07:57*	*12/07/22 20:04*	*1*
Phenol-d5 (Surr)	*0*	*Q cn*	*10 - 120*	*12/07/22 07:57*	*12/07/22 20:04*	*1*

Method: SW846 8270E - Semivolatile Organic Compounds (GC/MS) - TCLP - RE

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
1,4-Dichlorobenzene	0.0050	U H	0.010	0.0050	0.0025	mg/L		12/11/22 16:09	1
2,4,5-Trichlorophenol	0.0050	U H	0.010	0.0050	0.0025	mg/L		12/11/22 16:09	1
2,4,6-Trichlorophenol	0.0050	U H	0.010	0.0050	0.0025	mg/L		12/11/22 16:09	1
2,4-Dinitrotoluene	0.010	U H	0.025	0.010	0.0050	mg/L		12/11/22 16:09	1
2-Methylphenol	0.0050	U H	0.010	0.0050	0.0025	mg/L		12/11/22 16:09	1
4-Methylphenol	0.0050	U H	0.010	0.0050	0.0025	mg/L		12/11/22 16:09	1
Hexachlorobenzene	0.0011	U H	0.0025	0.0011	0.00055	mg/L		12/11/22 16:09	1
Hexachlorobutadiene	0.0050	U H	0.010	0.0050	0.0025	mg/L		12/11/22 16:09	1

Client Sample ID: NBKK-IDW09-SO-111522

Lab Sample ID: 410-106216-5

Date Collected: 11/15/22 14:00

Matrix: Solid

Date Received: 11/17/22 10:05

Method: SW846 8270E - Semivolatile Organic Compounds (GC/MS) - TCLP - RE (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Hexachloroethane	0.0050	U H	0.025	0.0050	0.0025	mg/L		12/11/22 16:09	1
Nitrobenzene	0.0050	U M H	0.010	0.0050	0.0025	mg/L		12/11/22 16:09	1
Pentachlorophenol	0.020	U H	0.025	0.020	0.0050	mg/L		12/11/22 16:09	1
Pyridine	0.020	U H	0.025	0.020	0.010	mg/L		12/11/22 16:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*71*		*43 - 140*	*12/09/22 17:20*	*12/11/22 16:09*	*1*
2-Fluorobiphenyl (Surr)	*84*		*44 - 119*	*12/09/22 17:20*	*12/11/22 16:09*	*1*
2-Fluorophenol (Surr)	*32*		*19 - 119*	*12/09/22 17:20*	*12/11/22 16:09*	*1*
Nitrobenzene-d5 (Surr)	*86*		*44 - 120*	*12/09/22 17:20*	*12/11/22 16:09*	*1*
p-Terphenyl-d14 (Surr)	*82*		*50 - 134*	*12/09/22 17:20*	*12/11/22 16:09*	*1*
Phenol-d5 (Surr)	*23*		*10 - 120*	*12/09/22 17:20*	*12/11/22 16:09*	*1*

Method: SW846 6020B - Metals (ICP/MS) - TCLP

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	17	U	20	17	6.8	ug/L		12/16/22 14:59	1
Barium	**360**		20	16	7.5	ug/L		12/16/22 14:59	1
Cadmium	4.0	U	5.0	4.0	1.5	ug/L		12/16/22 14:59	1
Chromium	8.0	U	20	8.0	3.3	ug/L		12/16/22 14:59	1
Lead	**16**		5.0	2.0	0.71	ug/L		12/16/22 14:59	1
Selenium	6.0	U	10	6.0	2.8	ug/L		12/16/22 14:59	1
Silver	3.0	U	5.0	3.0	1.0	ug/L		12/16/22 14:59	1

Method: SW846 7470A - Mercury (CVAA) - TCLP

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	0.16	U	0.20	0.16	0.079	ug/L		12/04/22 13:49	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Flashpoint (SW846 1010A)	**>200**	**cn**	50.0	50.0	50.0	Degrees F		11/26/22 06:35	1
Cyanide, Reactive (SW846 9012)	49	U Q cn	59	49	20	mg/Kg		11/30/22 17:23	1
Sulfide, Reactive (SW846 9034)	140	U cn	160	140	53	mg/Kg		11/30/22 13:10	1
Percent Moisture (EPA Moisture)	**14.5**		1.0		1.0	%		11/20/22 21:55	1
Percent Solids (EPA Moisture)	**85.5**		1.0		1.0	%		11/20/22 21:55	1

Client Sample ID: NBKK-IDW09-SO-111522

Lab Sample ID: 410-106216-5

Date Collected: 11/15/22 14:00

Matrix: Solid

Date Received: 11/17/22 10:05

Percent Solids: 85.5

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
1-Methylnaphthalene	**0.011**	**D cn**	0.0097	0.0078	0.0039	mg/Kg	☼	12/01/22 00:14	5
2-Methylnaphthalene	**0.011**	**J D M cn**	0.019	0.016	0.0078	mg/Kg	☼	12/01/22 00:14	5
Acenaphthene	**0.019**	**D M cn**	0.0097	0.0078	0.0039	mg/Kg	☼	12/01/22 00:14	5
Acenaphthylene	**0.0019**	**J D M cn**	0.0097	0.0078	0.0019	mg/Kg	☼	12/01/22 00:14	5
Anthracene	**0.032**	**D cn**	0.0097	0.0078	0.0039	mg/Kg	☼	12/01/22 00:14	5
Benzo[a]anthracene	**0.050**	**D cn**	0.0097	0.0078	0.0039	mg/Kg	☼	12/01/22 00:14	5
Benzo[a]pyrene	**0.041**	**D M cn**	0.0097	0.0078	0.0039	mg/Kg	☼	12/01/22 00:14	5
Benzo[b]fluoranthene	**0.038**	**D M cn**	0.0097	0.0078	0.0039	mg/Kg	☼	12/01/22 00:14	5
Benzo[g,h,i]perylene	**0.028**	**D cn**	0.0097	0.0078	0.0039	mg/Kg	☼	12/01/22 00:14	5
Benzo[k]fluoranthene	**0.011**	**D M cn**	0.0097	0.0078	0.0039	mg/Kg	☼	12/01/22 00:14	5

Client Sample ID: NBKK-IDW09-SO-111522

Date Collected: 11/15/22 14:00
Date Received: 11/17/22 10:05

Lab Sample ID: 410-106216-5

Matrix: Solid
Percent Solids: 85.5

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Chrysene	**0.071**	**D cn**	0.0097	0.0078	0.0019	mg/Kg	☼	12/01/22 00:14	5
Dibenz(a,h)anthracene	**0.0082**	**J D cn**	0.0097	0.0078	0.0039	mg/Kg	☼	12/01/22 00:14	5
Fluoranthene	**0.077**	**D cn**	0.0097	0.0078	0.0039	mg/Kg	☼	12/01/22 00:14	5
Fluorene	**0.015**	**D cn**	0.0097	0.0078	0.0039	mg/Kg	☼	12/01/22 00:14	5
Indeno[1,2,3-cd]pyrene	**0.024**	**D cn**	0.0097	0.0078	0.0039	mg/Kg	☼	12/01/22 00:14	5
Naphthalene	0.016	U cn	0.019	0.016	0.0078	mg/Kg	☼	12/01/22 00:14	5
Phenanthrene	**0.15**	**D cn**	0.014	0.012	0.0058	mg/Kg	☼	12/01/22 00:14	5
Pyrene	**0.12**	**D M cn**	0.0097	0.0078	0.0039	mg/Kg	☼	12/01/22 00:14	5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Benzo(a)pyrene-d12 (Surr)	*80*	*cn*	*19 - 133*	*11/29/22 15:15*	*12/01/22 00:14*	*5*
Fluoranthene-d10 (Surr)	*85*	*cn*	*22 - 152*	*11/29/22 15:15*	*12/01/22 00:14*	*5*
1-Methylnaphthalene-d10 (Surr)	*79*	*cn*	*26 - 123*	*11/29/22 15:15*	*12/01/22 00:14*	*5*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
C7-C12 (1C)	**3.4**	**J D M**	6.7	0.67	0.31	mg/Kg	☼	11/23/22 15:51	25

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*102*		*50 - 150*	*11/21/22 18:28*	*11/23/22 15:51*	*25*

Method: SW846 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
PCB-1016 (1C)	0.012	U M	0.020	0.012	0.0062	mg/Kg	☼	11/29/22 21:04	1
PCB-1221 (1C)	0.012	U	0.020	0.012	0.0062	mg/Kg	☼	11/29/22 21:04	1
PCB-1232 (1C)	0.012	U M	0.020	0.012	0.0062	mg/Kg	☼	11/29/22 21:04	1
PCB-1242 (1C)	0.012	U M	0.020	0.012	0.0062	mg/Kg	☼	11/29/22 21:04	1
PCB-1248 (1C)	0.012	U M	0.020	0.012	0.0062	mg/Kg	☼	11/29/22 21:04	1
PCB-1254 (1C)	0.012	U M	0.020	0.012	0.0075	mg/Kg	☼	11/29/22 21:04	1
PCB-1260 (1C)	0.012	U M	0.020	0.012	0.0075	mg/Kg	☼	11/29/22 21:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene (1C)	*87*		*44 - 130*	*11/29/22 09:14*	*11/29/22 21:04*	*1*
Tetrachloro-m-xylene (2C)	*91*		*44 - 130*	*11/29/22 09:14*	*11/29/22 21:04*	*1*
DCB Decachlorobiphenyl (Surr) (1C)	*57*	*J1 Q cn*	*66 - 130*	*11/29/22 09:14*	*11/29/22 21:04*	*1*
DCB Decachlorobiphenyl (Surr) (2C)	*93*	*J1 cn*	*66 - 130*	*11/29/22 09:14*	*11/29/22 21:04*	*1*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
C12-C24	**32**	**J1 M**	12	9.3	4.6	mg/Kg	☼	11/29/22 23:56	1
C24-C40	**250**	**M**	35	23	12	mg/Kg	☼	11/29/22 23:56	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o- terphenyl (Surr)	*105*		*50 - 150*	*11/28/22 09:26*	*11/29/22 23:56*	*1*

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	**66**	**D**	0.33	0.27	0.11	mg/Kg	☼	12/06/22 18:36	2
Barium	**49**	**D**	0.33	0.30	0.15	mg/Kg	☼	12/06/22 18:36	2
Cadmium	**0.31**	**D**	0.083	0.066	0.033	mg/Kg	☼	12/06/22 18:36	2
Chromium	**22**	**D**	0.33	0.25	0.13	mg/Kg	☼	12/06/22 18:36	2

Client Sample ID: NBKK-IDW09-SO-111522

Lab Sample ID: 410-106216-5
Date Collected: 11/15/22 14:00
Matrix: Solid
Date Received: 11/17/22 10:05
Percent Solids: 85.5

Method: SW846 6020B - Metals (ICP/MS) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Copper	18	D	0.33	0.25	0.073	mg/Kg	☼	12/06/22 18:36	2
Lead	11	D	0.17	0.13	0.063	mg/Kg	☼	12/06/22 18:36	2
Nickel	29	D	0.33	0.27	0.14	mg/Kg	☼	12/06/22 18:36	2
Selenium	0.11	J D	0.33	0.17	0.083	mg/Kg	☼	12/06/22 18:36	2
Silver	0.065	J D	0.083	0.066	0.034	mg/Kg	☼	12/06/22 18:36	2
Zinc	28	D	25	6.6	3.3	mg/Kg	☼	12/06/22 18:36	2

Method: SW846 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	0.049	J	0.070	0.047	0.023	mg/Kg	☼	11/21/22 14:01	1

Client Sample ID: NBKK-IDW10-SO-111522

Lab Sample ID: 410-106216-6
Date Collected: 11/15/22 14:40
Matrix: Solid
Date Received: 11/17/22 10:05
Percent Solids: 84.9

Method: SW846 8260D - Volatile Organic Compounds (GC/MS) - TCLP

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Benzene	12	U	20	12	6.0	ug/L		12/04/22 20:40	20
Carbon tetrachloride	12	U	20	12	6.0	ug/L		12/04/22 20:40	20
Chlorobenzene	12	U	20	12	6.0	ug/L		12/04/22 20:40	20
Chloroform	12	U	20	12	6.0	ug/L		12/04/22 20:40	20
1,2-Dichloroethane	12	U	20	12	6.0	ug/L		12/04/22 20:40	20
1,1-Dichloroethene	12	U	20	12	6.0	ug/L		12/04/22 20:40	20
2-Butanone	20	U	200	20	10	ug/L		12/04/22 20:40	20
Tetrachloroethene	12	U	20	12	6.0	ug/L		12/04/22 20:40	20
Trichloroethene	12	U	20	12	6.0	ug/L		12/04/22 20:40	20
Vinyl chloride	10	U	20	10	4.0	ug/L		12/04/22 20:40	20

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*99*		*81 - 118*		*12/04/22 20:40*	*20*
4-Bromofluorobenzene (Surr)	*93*		*85 - 114*		*12/04/22 20:40*	*20*
Dibromofluoromethane (Surr)	*101*		*80 - 119*		*12/04/22 20:40*	*20*
Toluene-d8 (Surr)	*102*		*89 - 112*		*12/04/22 20:40*	*20*

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
1-Methylnaphthalene	0.044	U cn	0.056	0.044	0.022	mg/Kg	☼	12/01/22 00:37	5
2-Methylnaphthalene	0.089	U cn	0.11	0.089	0.044	mg/Kg	☼	12/01/22 00:37	5
Acenaphthene	0.044	U cn	0.056	0.044	0.022	mg/Kg	☼	12/01/22 00:37	5
Acenaphthylene	0.044	U cn	0.056	0.044	0.011	mg/Kg	☼	12/01/22 00:37	5
Anthracene	0.044	U cn	0.056	0.044	0.022	mg/Kg	☼	12/01/22 00:37	5
Benzo[a]anthracene	0.044	U cn	0.056	0.044	0.022	mg/Kg	☼	12/01/22 00:37	5
Benzo[a]pyrene	0.044	U cn	0.056	0.044	0.022	mg/Kg	☼	12/01/22 00:37	5
Benzo[b]fluoranthene	0.044	U cn	0.056	0.044	0.022	mg/Kg	☼	12/01/22 00:37	5
Benzo[g,h,i]perylene	0.044	U cn	0.056	0.044	0.022	mg/Kg	☼	12/01/22 00:37	5
Benzo[k]fluoranthene	0.044	U cn	0.056	0.044	0.022	mg/Kg	☼	12/01/22 00:37	5
Chrysene	0.044	U cn	0.056	0.044	0.011	mg/Kg	☼	12/01/22 00:37	5
Dibenz(a,h)anthracene	0.044	U cn	0.056	0.044	0.022	mg/Kg	☼	12/01/22 00:37	5
Fluoranthene	0.044	U cn	0.056	0.044	0.022	mg/Kg	☼	12/01/22 00:37	5
Fluorene	0.044	U cn	0.056	0.044	0.022	mg/Kg	☼	12/01/22 00:37	5
Indeno[1,2,3-cd]pyrene	0.044	U cn	0.056	0.044	0.022	mg/Kg	☼	12/01/22 00:37	5

Client Sample ID: NBKK-IDW10-SO-111522
Date Collected: 11/15/22 14:40
Date Received: 11/17/22 10:05

Lab Sample ID: 410-106216-6
Matrix: Solid
Percent Solids: 84.9

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Naphthalene	0.089	U cn	0.11	0.089	0.044	mg/Kg	☼	12/01/22 00:37	5
Phenanthrene	0.067	U cn	0.078	0.067	0.033	mg/Kg	☼	12/01/22 00:37	5
Pyrene	0.044	U cn	0.056	0.044	0.022	mg/Kg	☼	12/01/22 00:37	5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Benzo(a)pyrene-d12 (Surr)	*85*	*cn*	*19 - 133*	*11/29/22 15:15*	*12/01/22 00:37*	*5*
Fluoranthene-d10 (Surr)	*75*	*cn*	*22 - 152*	*11/29/22 15:15*	*12/01/22 00:37*	*5*
1-Methylnaphthalene-d10 (Surr)	*77*	*cn*	*26 - 123*	*11/29/22 15:15*	*12/01/22 00:37*	*5*

Method: SW846 8270E - Semivolatile Organic Compounds (GC/MS) - TCLP

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
1,4-Dichlorobenzene	0.0050	U	0.010	0.0050	0.0025	mg/L		12/07/22 20:26	1
2,4,5-Trichlorophenol	0.0050	U	0.010	0.0050	0.0025	mg/L		12/07/22 20:26	1
2,4,6-Trichlorophenol	0.0050	U	0.010	0.0050	0.0025	mg/L		12/07/22 20:26	1
2,4-Dinitrotoluene	0.010	U	0.025	0.010	0.0050	mg/L		12/07/22 20:26	1
2-Methylphenol	0.0050	U	0.010	0.0050	0.0025	mg/L		12/07/22 20:26	1
4-Methylphenol	0.0050	U	0.010	0.0050	0.0025	mg/L		12/07/22 20:26	1
Hexachlorobenzene	0.0011	U	0.0025	0.0011	0.00055	mg/L		12/07/22 20:26	1
Hexachlorobutadiene	0.0050	U	0.010	0.0050	0.0025	mg/L		12/07/22 20:26	1
Hexachloroethane	0.0050	U	0.025	0.0050	0.0025	mg/L		12/07/22 20:26	1
Nitrobenzene	0.0050	U M	0.010	0.0050	0.0025	mg/L		12/07/22 20:26	1
Pentachlorophenol	0.020	U	0.025	0.020	0.0050	mg/L		12/07/22 20:26	1
Pyridine	0.020	U	0.025	0.020	0.010	mg/L		12/07/22 20:26	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*94*		*43 - 140*	*12/07/22 07:57*	*12/07/22 20:26*	*1*
2-Fluorobiphenyl (Surr)	*83*		*44 - 119*	*12/07/22 07:57*	*12/07/22 20:26*	*1*
2-Fluorophenol (Surr)	*50*		*19 - 119*	*12/07/22 07:57*	*12/07/22 20:26*	*1*
Nitrobenzene-d5 (Surr)	*95*		*44 - 120*	*12/07/22 07:57*	*12/07/22 20:26*	*1*
p-Terphenyl-d14 (Surr)	*100*		*50 - 134*	*12/07/22 07:57*	*12/07/22 20:26*	*1*
Phenol-d5 (Surr)	*33*		*10 - 120*	*12/07/22 07:57*	*12/07/22 20:26*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
C7-C12 (1C)	**22**	**J D M cn**	58	5.8	2.7	mg/Kg	☼	11/23/22 16:40	200
C7-C12 (1C)	**0.38**	**J D**	6.8	0.68	0.31	mg/Kg	☼	11/29/22 22:56	25

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*79*		*50 - 150*	*11/20/22 20:31*	*11/23/22 16:40*	*200*
a,a,a-Trifluorotoluene (fid) (1C)	*117*	*M*	*50 - 150*	*11/29/22 16:08*	*11/29/22 22:56*	*25*

Method: SW846 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
PCB-1016 (1C)	0.012	U M	0.020	0.012	0.0062	mg/Kg	☼	11/29/22 21:15	1
PCB-1221 (1C)	0.012	U	0.020	0.012	0.0062	mg/Kg	☼	11/29/22 21:15	1
PCB-1232 (1C)	0.012	U M	0.020	0.012	0.0062	mg/Kg	☼	11/29/22 21:15	1
PCB-1242 (1C)	0.012	U M	0.020	0.012	0.0062	mg/Kg	☼	11/29/22 21:15	1
PCB-1248 (1C)	0.012	U M	0.020	0.012	0.0062	mg/Kg	☼	11/29/22 21:15	1
PCB-1254 (1C)	0.012	U M	0.020	0.012	0.0075	mg/Kg	☼	11/29/22 21:15	1
PCB-1260 (1C)	0.012	U M	0.020	0.012	0.0075	mg/Kg	☼	11/29/22 21:15	1

Client Sample ID: NBKK-IDW10-SO-111522

Date Collected: 11/15/22 14:40
Date Received: 11/17/22 10:05

Lab Sample ID: 410-106216-6

Matrix: Solid
Percent Solids: 84.9

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene (1C)	*96*		*44 - 130*	*11/29/22 09:14*	*11/29/22 21:15*	*1*
Tetrachloro-m-xylene (2C)	*96*		*44 - 130*	*11/29/22 09:14*	*11/29/22 21:15*	*1*
DCB Decachlorobiphenyl (Surr) (1C)	*81*		*66 - 130*	*11/29/22 09:14*	*11/29/22 21:15*	*1*
DCB Decachlorobiphenyl (Surr) (2C)	*101*		*66 - 130*	*11/29/22 09:14*	*11/29/22 21:15*	*1*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
C12-C24	9.3	U M	12	9.3	4.6	mg/Kg	☼	11/29/22 22:36	1
C24-C40	23	U M	35	23	12	mg/Kg	☼	11/29/22 22:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o- terphenyl (Surr)	*96*		*50 - 150*	*11/28/22 09:26*	*11/29/22 22:36*	*1*

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	**2.3**	**D**	0.32	0.25	0.11	mg/Kg	☼	12/06/22 18:32	2
Barium	**53**	**D**	0.32	0.29	0.15	mg/Kg	☼	12/06/22 18:32	2
Cadmium	**0.088**	**D**	0.080	0.064	0.032	mg/Kg	☼	12/06/22 18:32	2
Chromium	**24**	**D**	0.32	0.24	0.12	mg/Kg	☼	12/06/22 18:32	2
Copper	**11**	**D**	0.32	0.24	0.070	mg/Kg	☼	12/06/22 18:32	2
Lead	**3.5**	**D**	0.16	0.13	0.061	mg/Kg	☼	12/06/22 18:32	2
Nickel	**41**	**D**	0.32	0.25	0.13	mg/Kg	☼	12/06/22 18:32	2
Selenium	0.16	U	0.32	0.16	0.080	mg/Kg	☼	12/06/22 18:32	2
Silver	0.064	U	0.080	0.064	0.032	mg/Kg	☼	12/06/22 18:32	2
Zinc	**26**	**D**	24	6.4	3.2	mg/Kg	☼	12/06/22 18:32	2

Method: SW846 6020B - Metals (ICP/MS) - TCLP

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	17	U	20	17	6.8	ug/L		12/09/22 08:26	1
Barium	**300**		20	16	7.5	ug/L		12/09/22 08:26	1
Cadmium	4.0	U	5.0	4.0	1.5	ug/L		12/09/22 08:26	1
Chromium	**7.6**	**J**	20	8.0	3.3	ug/L		12/09/22 08:26	1
Lead	**12**		5.0	2.0	0.71	ug/L		12/09/22 08:26	1
Selenium	6.0	U	10	6.0	2.8	ug/L		12/09/22 08:26	1
Silver	3.0	U	5.0	3.0	1.0	ug/L		12/09/22 08:26	1

Method: SW846 7470A - Mercury (CVAA) - TCLP

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	**0.089**	**J**	0.20	0.16	0.079	ug/L		12/04/22 14:48	1

Method: SW846 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	**0.038**	**J**	0.065	0.044	0.022	mg/Kg	☼	11/21/22 14:03	1

General Chemistry

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Flashpoint (SW846 1010A)	**>201**	**cn**	50.0	50.0	50.0	Degrees F		11/26/22 06:35	1
Cyanide, Reactive (SW846 9012)	49	U Q cn	59	49	20	mg/Kg		11/30/22 17:24	1
Sulfide, Reactive (SW846 9034)	140	U cn	160	140	53	mg/Kg		11/30/22 13:10	1
Percent Moisture (EPA Moisture)	**15.1**		1.0		1.0	%		11/20/22 21:55	1
Percent Solids (EPA Moisture)	**84.9**		1.0		1.0	%		11/20/22 21:55	1

Surrogate Summary

Client: Jacobs Engineering Group, Inc.
Project/Site: NBK Keyport

Job ID: 410-106216-1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Matrix: Solid — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	DBFM	TOL
Lab Sample ID	Client Sample ID	(81-118)	(85-114)	(80-119)	(89-112)
LCS 410-323476/4	Lab Control Sample	100	94	106	104
MB 410-323476/30	Method Blank	97	93	99	101

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)

Method: 8260D - Volatile Organic Compounds (GC/MS)

Matrix: Solid — **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	DBFM	TOL
Lab Sample ID	Client Sample ID	(81-118)	(85-114)	(80-119)	(89-112)
410-106216-1	NBKK-IDW05-SO-111522	102	92	100	100
410-106216-2	NBKK-IDW06-SO-111522	106	92	103	102
410-106216-3	NBKK-IDW07-SO-111522	99	90	101	98
410-106216-4	NBKK-IDW08-SO-111522	98	92	101	102
410-106216-5	NBKK-IDW09-SO-111522	103	94	103	103
410-106216-6	NBKK-IDW10-SO-111522	99	93	101	102

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)

Method: 8270E - Semivolatile Organic Compounds (GC/MS)

Matrix: Solid — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)					
		TBP	FBP	2FP	NBZ	TPHd14	PHL
Lab Sample ID	Client Sample ID	(43-140)	(44-119)	(19-119)	(44-120)	(50-134)	(10-120)
LCS 410-324430/2-A	Lab Control Sample	109	88	54	93	93	36
LCS 410-325576/2-A	Lab Control Sample	70	88	32	90	94	24
MB 410-324430/1-A	Method Blank	76	86	41	91	108	37
MB 410-325576/1-A	Method Blank	71	83	29	87	90	21

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl (Surr)
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
TPHd14 = p-Terphenyl-d14 (Surr)
PHL = Phenol-d5 (Surr)

Surrogate Summary

Client: Jacobs Engineering Group, Inc.
Project/Site: NBK Keyport

Job ID: 410-106216-1

Method: 8270E - Semivolatile Organic Compounds (GC/MS)

Matrix: Solid

Prep Type: TCLP

		Percent Surrogate Recovery (Acceptance Limits)					
Lab Sample ID	Client Sample ID	TBP (43-140)	FBP (44-119)	2FP (19-119)	NBZ (44-120)	TPHd14 (50-134)	PHL (10-120)
410-106216-1	NBKK-IDW05-SO-111522	93	86	40	97	78	28
410-106216-1 MS	NBKK-IDW05-SO-111522	89	80	46	88	98	34
410-106216-1 MSD	NBKK-IDW05-SO-111522	69	51	43	58	71	33
410-106216-2	NBKK-IDW06-SO-111522	74	61	41	67	80	30
410-106216-3	NBKK-IDW07-SO-111522	95	83	39	92	86	27
410-106216-4	NBKK-IDW08-SO-111522	92	84	52	98	112	36
410-106216-5	NBKK-IDW09-SO-111522	0.2 Q cn	0.05 Q cn	0 Q cn	0.1 Q cn	0.9 Q cn	0 Q cn
410-106216-5 - RE	NBKK-IDW09-SO-111522	71	84	32	86	82	23
410-106216-6	NBKK-IDW10-SO-111522	94	83	50	95	100	33

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl (Surr)
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
TPHd14 = p-Terphenyl-d14 (Surr)
PHL = Phenol-d5 (Surr)

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Matrix: Solid

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)		
Lab Sample ID	Client Sample ID	BAPd12 (19-133)	FLN10 (22-152)	MNPd10 (26-123)
410-106216-1	NBKK-IDW05-SO-111522	69	76	75
410-106216-2	NBKK-IDW06-SO-111522	90	83	78
410-106216-3	NBKK-IDW07-SO-111522	84 cn	74 cn	76 cn
410-106216-3 MS	NBKK-IDW07-SO-111522	75	65	70
410-106216-3 MSD	NBKK-IDW07-SO-111522	80	71	75
410-106216-4	NBKK-IDW08-SO-111522	85 cn	77 cn	78 cn
410-106216-5	NBKK-IDW09-SO-111522	80 cn	85 cn	79 cn
410-106216-6	NBKK-IDW10-SO-111522	85 cn	75 cn	77 cn
LCS 410-321761/2-A	Lab Control Sample	86	72	77
MB 410-321761/1-A	Method Blank	75	63	69

Surrogate Legend

BAPd12 = Benzo(a)pyrene-d12 (Surr)
FLN10 = Fluoranthene-d10 (Surr)
MNPd10 = 1-Methylnaphthalene-d10 (Surr)

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Matrix: Solid

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)
Lab Sample ID	Client Sample ID	TFT-F1 (50-150)
410-106216-1	NBKK-IDW05-SO-111522	113
410-106216-2	NBKK-IDW06-SO-111522	116
410-106216-3	NBKK-IDW07-SO-111522	108
410-106216-4	NBKK-IDW08-SO-111522	145
410-106216-5	NBKK-IDW09-SO-111522	102
410-106216-6	NBKK-IDW10-SO-111522	79

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC) (Continued)

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)						
Lab Sample ID	Client Sample ID	TFT-F1 (50-150)						
410-106216-6	NBKK-IDW10-SO-111522	117 M						
LCS 410-319656/6	Lab Control Sample	87						
LCS 410-320618/6	Lab Control Sample	100						
LCS 410-320624/6	Lab Control Sample	109						
LCS 410-321593/6	Lab Control Sample	94						
LCSD 410-319656/7	Lab Control Sample Dup	87						
LCSD 410-320618/7	Lab Control Sample Dup	99						
LCSD 410-320624/7	Lab Control Sample Dup	111						
LCSD 410-321593/7	Lab Control Sample Dup	96						
MB 410-319656/5	Method Blank	97						
MB 410-320618/5	Method Blank	100						
MB 410-320624/5	Method Blank	112						
MB 410-321593/9	Method Blank	108						

Surrogate Legend

TFT-F = a,a,a-Trifluorotoluene (fid)

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)						
Lab Sample ID	Client Sample ID	TCX1 (44-130)	TCX2 (44-130)	DCB1 (66-130)	DCB2 (66-130)			
410-106216-1	NBKK-IDW05-SO-111522	89	90	85	93			
410-106216-2	NBKK-IDW06-SO-111522	93	95	86	99			
410-106216-2 MS	NBKK-IDW06-SO-111522	82	83	76	90			
410-106216-2 MSD	NBKK-IDW06-SO-111522	85	87	77	96			
410-106216-3	NBKK-IDW07-SO-111522	85	87	77	97			
410-106216-4	NBKK-IDW08-SO-111522	92	91	82	97			
410-106216-5	NBKK-IDW09-SO-111522	87	91	57 J1 Q cn	93 J1 cn			
410-106216-6	NBKK-IDW10-SO-111522	96	96	81	101			
LCS 410-321539/2-A	Lab Control Sample	87	88	81	99			
MB 410-321539/1-A	Method Blank	86	87	80	95			

Surrogate Legend

TCX = Tetrachloro-m-xylene

DCB = DCB Decachlorobiphenyl (Surr)

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)						
Lab Sample ID	Client Sample ID	OTP (50-150)						
410-106216-1	NBKK-IDW05-SO-111522	95						
410-106216-2	NBKK-IDW06-SO-111522	101						
410-106216-3	NBKK-IDW07-SO-111522	98						
410-106216-4	NBKK-IDW08-SO-111522	98						
410-106216-5	NBKK-IDW09-SO-111522	105						
410-106216-5 DU	NBKK-IDW09-SO-111522	105						
410-106216-5 MS	NBKK-IDW09-SO-111522	112						

Surrogate Summary

Client: Jacobs Engineering Group, Inc.
Project/Site: NBK Keyport

Job ID: 410-106216-1

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC) (Continued)

Matrix: Solid

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)							
		OTP							
Lab Sample ID	Client Sample ID	(50-150)							
410-106216-6	NBKK-IDW10-SO-111522	96							
LCS 410-321051/2-A	Lab Control Sample	109							
MB 410-321051/1-A	Method Blank	99							

Surrogate Legend

OTP = o- terphenyl (Surr)

Method: 8260D - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 410-323476/30
Matrix: Solid
Analysis Batch: 323476

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Benzene	0.60	U	1.0	0.60	0.30	ug/L		12/04/22 15:43	1
Carbon tetrachloride	0.60	U	1.0	0.60	0.30	ug/L		12/04/22 15:43	1
Chlorobenzene	0.60	U	1.0	0.60	0.30	ug/L		12/04/22 15:43	1
Chloroform	0.60	U	1.0	0.60	0.30	ug/L		12/04/22 15:43	1
1,2-Dichloroethane	0.60	U	1.0	0.60	0.30	ug/L		12/04/22 15:43	1
1,1-Dichloroethene	0.60	U	1.0	0.60	0.30	ug/L		12/04/22 15:43	1
2-Butanone	1.0	U	10	1.0	0.50	ug/L		12/04/22 15:43	1
Tetrachloroethene	0.60	U	1.0	0.60	0.30	ug/L		12/04/22 15:43	1
Trichloroethene	0.60	U	1.0	0.60	0.30	ug/L		12/04/22 15:43	1
Vinyl chloride	0.50	U	1.0	0.50	0.20	ug/L		12/04/22 15:43	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*97*		*81 - 118*		*12/04/22 15:43*	*1*
4-Bromofluorobenzene (Surr)	*93*		*85 - 114*		*12/04/22 15:43*	*1*
Dibromofluoromethane (Surr)	*99*		*80 - 119*		*12/04/22 15:43*	*1*
Toluene-d8 (Surr)	*101*		*89 - 112*		*12/04/22 15:43*	*1*

Lab Sample ID: LCS 410-323476/4
Matrix: Solid
Analysis Batch: 323476

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Benzene	20.0	19.4		ug/L		97	79 - 120
Carbon tetrachloride	20.0	18.2		ug/L		91	72 - 136
Chlorobenzene	20.0	20.2		ug/L		101	82 - 118
Chloroform	20.0	19.0		ug/L		95	79 - 124
1,2-Dichloroethane	20.0	18.6		ug/L		93	73 - 128
1,1-Dichloroethene	20.0	20.2		ug/L		101	71 - 131
2-Butanone	250	222		ug/L		89	56 - 143
Tetrachloroethene	20.0	21.8		ug/L		109	74 - 129
Trichloroethene	20.0	18.2		ug/L		91	79 - 123
Vinyl chloride	20.0	17.7		ug/L		89	58 - 137

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*100*		*81 - 118*
4-Bromofluorobenzene (Surr)	*94*		*85 - 114*
Dibromofluoromethane (Surr)	*106*		*80 - 119*
Toluene-d8 (Surr)	*104*		*89 - 112*

Method: 8270E - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: MB 410-324430/1-A
Matrix: Solid
Analysis Batch: 324707

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 324430

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
1,4-Dichlorobenzene	0.0050	U	0.010	0.0050	0.0025	mg/L		12/07/22 16:54	1
2,4,5-Trichlorophenol	0.0050	U	0.010	0.0050	0.0025	mg/L		12/07/22 16:54	1

Method: 8270E - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 410-324430/1-A
Matrix: Solid
Analysis Batch: 324707

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 324430

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
2,4,6-Trichlorophenol	0.0050	U	0.010	0.0050	0.0025	mg/L		12/07/22 16:54	1
2,4-Dinitrotoluene	0.010	U	0.025	0.010	0.0050	mg/L		12/07/22 16:54	1
2-Methylphenol	0.0050	U	0.010	0.0050	0.0025	mg/L		12/07/22 16:54	1
4-Methylphenol	0.0050	U	0.010	0.0050	0.0025	mg/L		12/07/22 16:54	1
Hexachlorobenzene	0.0011	U	0.0025	0.0011	0.00055	mg/L		12/07/22 16:54	1
Hexachlorobutadiene	0.0050	U	0.010	0.0050	0.0025	mg/L		12/07/22 16:54	1
Hexachloroethane	0.0050	U	0.025	0.0050	0.0025	mg/L		12/07/22 16:54	1
Nitrobenzene	0.0050	U	0.010	0.0050	0.0025	mg/L		12/07/22 16:54	1
Pentachlorophenol	0.020	U	0.025	0.020	0.0050	mg/L		12/07/22 16:54	1
Pyridine	0.020	U	0.025	0.020	0.010	mg/L		12/07/22 16:54	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*76*		*43 - 140*	*12/07/22 07:57*	*12/07/22 16:54*	*1*
2-Fluorobiphenyl (Surr)	*86*		*44 - 119*	*12/07/22 07:57*	*12/07/22 16:54*	*1*
2-Fluorophenol (Surr)	*41*		*19 - 119*	*12/07/22 07:57*	*12/07/22 16:54*	*1*
Nitrobenzene-d5 (Surr)	*91*		*44 - 120*	*12/07/22 07:57*	*12/07/22 16:54*	*1*
p-Terphenyl-d14 (Surr)	*108*		*50 - 134*	*12/07/22 07:57*	*12/07/22 16:54*	*1*
Phenol-d5 (Surr)	*37*		*10 - 120*	*12/07/22 07:57*	*12/07/22 16:54*	*1*

Lab Sample ID: LCS 410-324430/2-A
Matrix: Solid
Analysis Batch: 324707

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 324430

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1,4-Dichlorobenzene	0.250	0.201		mg/L		80	29 - 112
2,4,5-Trichlorophenol	0.250	0.260		mg/L		104	53 - 123
2,4,6-Trichlorophenol	0.250	0.257		mg/L		103	50 - 125
2,4-Dinitrotoluene	0.250	0.295		mg/L		118	57 - 128
2-Methylphenol	0.250	0.200		mg/L		80	30 - 117
4-Methylphenol	0.250	0.194		mg/L		77	25 - 120
Hexachlorobenzene	0.250	0.250		mg/L		100	53 - 125
Hexachlorobutadiene	0.250	0.189		mg/L		76	22 - 124
Hexachloroethane	0.250	0.204		mg/L		82	21 - 115
Nitrobenzene	0.250	0.247		mg/L		99	45 - 121
Pentachlorophenol	0.500	0.560		mg/L		112	35 - 138
Pyridine	0.500	0.241		mg/L		48	23 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*109*		*43 - 140*
2-Fluorobiphenyl (Surr)	*88*		*44 - 119*
2-Fluorophenol (Surr)	*54*		*19 - 119*
Nitrobenzene-d5 (Surr)	*93*		*44 - 120*
p-Terphenyl-d14 (Surr)	*93*		*50 - 134*
Phenol-d5 (Surr)	*36*		*10 - 120*

Method: 8270E - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 410-325576/1-A
Matrix: Solid
Analysis Batch: 325794

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 325576

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
1,4-Dichlorobenzene	0.0050	U	0.010	0.0050	0.0025	mg/L		12/11/22 14:02	1
2,4,5-Trichlorophenol	0.0050	U	0.010	0.0050	0.0025	mg/L		12/11/22 14:02	1
2,4,6-Trichlorophenol	0.0050	U	0.010	0.0050	0.0025	mg/L		12/11/22 14:02	1
2,4-Dinitrotoluene	0.010	U M	0.025	0.010	0.0050	mg/L		12/11/22 14:02	1
2-Methylphenol	0.0050	U	0.010	0.0050	0.0025	mg/L		12/11/22 14:02	1
4-Methylphenol	0.0050	U	0.010	0.0050	0.0025	mg/L		12/11/22 14:02	1
Hexachlorobenzene	0.0011	U	0.0025	0.0011	0.00055	mg/L		12/11/22 14:02	1
Hexachlorobutadiene	0.0050	U	0.010	0.0050	0.0025	mg/L		12/11/22 14:02	1
Hexachloroethane	0.0050	U	0.025	0.0050	0.0025	mg/L		12/11/22 14:02	1
Nitrobenzene	0.0050	U M	0.010	0.0050	0.0025	mg/L		12/11/22 14:02	1
Pentachlorophenol	0.020	U	0.025	0.020	0.0050	mg/L		12/11/22 14:02	1
Pyridine	0.020	U	0.025	0.020	0.010	mg/L		12/11/22 14:02	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*71*		*43 - 140*	*12/09/22 17:20*	*12/11/22 14:02*	*1*
2-Fluorobiphenyl (Surr)	*83*		*44 - 119*	*12/09/22 17:20*	*12/11/22 14:02*	*1*
2-Fluorophenol (Surr)	*29*		*19 - 119*	*12/09/22 17:20*	*12/11/22 14:02*	*1*
Nitrobenzene-d5 (Surr)	*87*		*44 - 120*	*12/09/22 17:20*	*12/11/22 14:02*	*1*
p-Terphenyl-d14 (Surr)	*90*		*50 - 134*	*12/09/22 17:20*	*12/11/22 14:02*	*1*
Phenol-d5 (Surr)	*21*		*10 - 120*	*12/09/22 17:20*	*12/11/22 14:02*	*1*

Lab Sample ID: LCS 410-325576/2-A
Matrix: Solid
Analysis Batch: 325794

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 325576

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1,4-Dichlorobenzene	0.0500	0.0408		mg/L		82	29 - 112
2,4,5-Trichlorophenol	0.0500	0.0370		mg/L		74	53 - 123
2,4,6-Trichlorophenol	0.0500	0.0369		mg/L		74	50 - 125
2,4-Dinitrotoluene	0.0500	0.0616		mg/L		123	57 - 128
2-Methylphenol	0.0500	0.0288		mg/L		58	30 - 117
4-Methylphenol	0.0500	0.0273		mg/L		55	25 - 120
Hexachlorobenzene	0.0500	0.0535		mg/L		107	53 - 125
Hexachlorobutadiene	0.0500	0.0407		mg/L		81	22 - 124
Hexachloroethane	0.0500	0.0417		mg/L		83	21 - 115
Nitrobenzene	0.0500	0.0504		mg/L		101	45 - 121
Pentachlorophenol	0.100	0.0770		mg/L		77	35 - 138
Pyridine	0.100	0.0473		mg/L		47	23 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*70*		*43 - 140*
2-Fluorobiphenyl (Surr)	*88*		*44 - 119*
2-Fluorophenol (Surr)	*32*		*19 - 119*
Nitrobenzene-d5 (Surr)	*90*		*44 - 120*
p-Terphenyl-d14 (Surr)	*94*		*50 - 134*
Phenol-d5 (Surr)	*24*		*10 - 120*

Method: 8270E - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 410-106216-1 MS
Matrix: Solid
Analysis Batch: 324707

Client Sample ID: NBKK-IDW05-SO-111522
Prep Type: TCLP
Prep Batch: 324430

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
1,4-Dichlorobenzene	0.0050	U J1	0.250	0.197		mg/L		79	29 - 112
2,4,5-Trichlorophenol	0.0050	U J1	0.250	0.235		mg/L		94	53 - 123
2,4,6-Trichlorophenol	0.0050	U J1	0.250	0.215		mg/L		86	50 - 125
2,4-Dinitrotoluene	0.010	U J1	0.250	0.257		mg/L		103	57 - 128
2-Methylphenol	0.0050	U	0.250	0.181		mg/L		72	30 - 117
4-Methylphenol	0.0050	U	0.250	0.165		mg/L		66	25 - 120
Hexachlorobenzene	0.0011	U J1	0.250	0.225		mg/L		90	53 - 125
Hexachlorobutadiene	0.0050	U J1	0.250	0.181		mg/L		72	22 - 124
Hexachloroethane	0.0050	U J1	0.250	0.193		mg/L		77	21 - 115
Nitrobenzene	0.0050	U M J1	0.250	0.230		mg/L		92	45 - 121
Pentachlorophenol	0.020	U J1	0.500	0.559		mg/L		112	35 - 138
Pyridine	0.020	U	0.500	0.260		mg/L		52	23 - 120

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*89*		*43 - 140*
2-Fluorobiphenyl (Surr)	*80*		*44 - 119*
2-Fluorophenol (Surr)	*46*		*19 - 119*
Nitrobenzene-d5 (Surr)	*88*		*44 - 120*
p-Terphenyl-d14 (Surr)	*98*		*50 - 134*
Phenol-d5 (Surr)	*34*		*10 - 120*

Lab Sample ID: 410-106216-1 MSD
Matrix: Solid
Analysis Batch: 324707

Client Sample ID: NBKK-IDW05-SO-111522
Prep Type: TCLP
Prep Batch: 324430

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
1,4-Dichlorobenzene	0.0050	U J1	0.250	0.115	J1	mg/L		46	29 - 112	52	20
2,4,5-Trichlorophenol	0.0050	U J1	0.250	0.173	J1	mg/L		69	53 - 123	30	20
2,4,6-Trichlorophenol	0.0050	U J1	0.250	0.163	J1	mg/L		65	50 - 125	28	20
2,4-Dinitrotoluene	0.010	U J1	0.250	0.166	J1	mg/L		66	57 - 128	43	20
2-Methylphenol	0.0050	U	0.250	0.154		mg/L		62	30 - 117	16	20
4-Methylphenol	0.0050	U	0.250	0.151		mg/L		60	25 - 120	9	20
Hexachlorobenzene	0.0011	U J1	0.250	0.151	J1	mg/L		60	53 - 125	39	20
Hexachlorobutadiene	0.0050	U J1	0.250	0.114	J1	mg/L		46	22 - 124	46	20
Hexachloroethane	0.0050	U J1	0.250	0.114	J1	mg/L		45	21 - 115	52	20
Nitrobenzene	0.0050	U M J1	0.250	0.153	J1	mg/L		61	45 - 121	40	20
Pentachlorophenol	0.020	U J1	0.500	0.371	J1	mg/L		74	35 - 138	40	20
Pyridine	0.020	U	0.500	0.219		mg/L		44	23 - 120	17	30

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
2,4,6-Tribromophenol (Surr)	*69*		*43 - 140*
2-Fluorobiphenyl (Surr)	*51*		*44 - 119*
2-Fluorophenol (Surr)	*43*		*19 - 119*
Nitrobenzene-d5 (Surr)	*58*		*44 - 120*
p-Terphenyl-d14 (Surr)	*71*		*50 - 134*
Phenol-d5 (Surr)	*33*		*10 - 120*

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Lab Sample ID: MB 410-321761/1-A
Matrix: Solid
Analysis Batch: 322229

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 321761

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
1-Methylnaphthalene	0.0013	U	0.0017	0.0013	0.00067	mg/Kg		11/30/22 16:46	1
2-Methylnaphthalene	0.0027	U	0.0033	0.0027	0.0013	mg/Kg		11/30/22 16:46	1
Acenaphthene	0.0013	U	0.0017	0.0013	0.00067	mg/Kg		11/30/22 16:46	1
Acenaphthylene	0.0013	U M	0.0017	0.0013	0.00033	mg/Kg		11/30/22 16:46	1
Anthracene	0.0013	U	0.0017	0.0013	0.00067	mg/Kg		11/30/22 16:46	1
Benzo[a]anthracene	0.0013	U	0.0017	0.0013	0.00067	mg/Kg		11/30/22 16:46	1
Benzo[a]pyrene	0.0013	U	0.0017	0.0013	0.00067	mg/Kg		11/30/22 16:46	1
Benzo[b]fluoranthene	0.0013	U	0.0017	0.0013	0.00067	mg/Kg		11/30/22 16:46	1
Benzo[g,h,i]perylene	0.0013	U	0.0017	0.0013	0.00067	mg/Kg		11/30/22 16:46	1
Benzo[k]fluoranthene	0.0013	U	0.0017	0.0013	0.00067	mg/Kg		11/30/22 16:46	1
Chrysene	0.0013	U	0.0017	0.0013	0.00033	mg/Kg		11/30/22 16:46	1
Dibenz(a,h)anthracene	0.0013	U	0.0017	0.0013	0.00067	mg/Kg		11/30/22 16:46	1
Fluoranthene	0.0013	U	0.0017	0.0013	0.00067	mg/Kg		11/30/22 16:46	1
Fluorene	0.0013	U	0.0017	0.0013	0.00067	mg/Kg		11/30/22 16:46	1
Indeno[1,2,3-cd]pyrene	0.0013	U	0.0017	0.0013	0.00067	mg/Kg		11/30/22 16:46	1
Naphthalene	0.0027	U	0.0033	0.0027	0.0013	mg/Kg		11/30/22 16:46	1
Phenanthrene	0.0020	U	0.0023	0.0020	0.0010	mg/Kg		11/30/22 16:46	1
Pyrene	0.0013	U	0.0017	0.0013	0.00067	mg/Kg		11/30/22 16:46	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Benzo(a)pyrene-d12 (Surr)	*75*		*19 - 133*	*11/29/22 15:15*	*11/30/22 16:46*	*1*
Fluoranthene-d10 (Surr)	*63*		*22 - 152*	*11/29/22 15:15*	*11/30/22 16:46*	*1*
1-Methylnaphthalene-d10 (Surr)	*69*		*26 - 123*	*11/29/22 15:15*	*11/30/22 16:46*	*1*

Lab Sample ID: LCS 410-321761/2-A
Matrix: Solid
Analysis Batch: 322229

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 321761

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1-Methylnaphthalene	0.0333	0.0269		mg/Kg		81	43 - 111
2-Methylnaphthalene	0.0333	0.0247		mg/Kg		74	39 - 114
Acenaphthene	0.0333	0.0261		mg/Kg		78	44 - 111
Acenaphthylene	0.0333	0.0252		mg/Kg		76	39 - 116
Anthracene	0.0333	0.0268		mg/Kg		81	50 - 114
Benzo[a]anthracene	0.0333	0.0253		mg/Kg		76	54 - 122
Benzo[a]pyrene	0.0333	0.0268		mg/Kg		80	50 - 125
Benzo[b]fluoranthene	0.0333	0.0267		mg/Kg		80	53 - 128
Benzo[g,h,i]perylene	0.0333	0.0324		mg/Kg		97	49 - 127
Benzo[k]fluoranthene	0.0333	0.0270		mg/Kg		81	56 - 123
Chrysene	0.0333	0.0256		mg/Kg		77	57 - 118
Dibenz(a,h)anthracene	0.0333	0.0332		mg/Kg		100	50 - 129
Fluoranthene	0.0333	0.0253		mg/Kg		76	55 - 119
Fluorene	0.0333	0.0263		mg/Kg		79	47 - 114
Indeno[1,2,3-cd]pyrene	0.0333	0.0332	M	mg/Kg		99	49 - 130
Naphthalene	0.0333	0.0267		mg/Kg		80	38 - 111
Phenanthrene	0.0333	0.0271		mg/Kg		81	49 - 113
Pyrene	0.0333	0.0252		mg/Kg		76	55 - 117

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Lab Sample ID: LCS 410-321761/2-A
Matrix: Solid
Analysis Batch: 322229

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 321761

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Benzo(a)pyrene-d12 (Surr)	86		19 - 133
Fluoranthene-d10 (Surr)	72		22 - 152
1-Methylnaphthalene-d10 (Surr)	77		26 - 123

Lab Sample ID: 410-106216-3 MS
Matrix: Solid
Analysis Batch: 322229

Client Sample ID: NBKK-IDW07-SO-111522
Prep Type: Total/NA
Prep Batch: 321761

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
1-Methylnaphthalene	0.046	U cn	0.213	0.159	D	mg/Kg	☼	75	43 - 111
2-Methylnaphthalene	0.092	U cn	0.213	0.147	D	mg/Kg	☼	69	39 - 114
Acenaphthene	0.046	U cn	0.213	0.145	D	mg/Kg	☼	68	44 - 111
Acenaphthylene	0.046	U cn	0.213	0.142	D	mg/Kg	☼	67	39 - 116
Anthracene	0.046	U cn	0.213	0.149	D	mg/Kg	☼	70	50 - 114
Benzo[a]anthracene	0.046	U cn	0.213	0.149	D	mg/Kg	☼	70	54 - 122
Benzo[a]pyrene	0.046	U cn	0.213	0.146	D	mg/Kg	☼	68	50 - 125
Benzo[b]fluoranthene	0.046	U cn	0.213	0.140	D	mg/Kg	☼	66	53 - 128
Benzo[g,h,i]perylene	0.046	U cn	0.213	0.154	D	mg/Kg	☼	72	49 - 127
Benzo[k]fluoranthene	0.046	U cn	0.213	0.148	D	mg/Kg	☼	70	56 - 123
Chrysene	0.046	U cn	0.213	0.144	D	mg/Kg	☼	68	57 - 118
Dibenz(a,h)anthracene	0.046	U cn	0.213	0.169	D	mg/Kg	☼	80	50 - 129
Fluoranthene	0.046	U cn	0.213	0.149	D	mg/Kg	☼	70	55 - 119
Fluorene	0.046	U cn	0.213	0.151	D	mg/Kg	☼	71	47 - 114
Indeno[1,2,3-cd]pyrene	0.046	U cn	0.213	0.166	D M	mg/Kg	☼	78	49 - 130
Naphthalene	0.092	U cn	0.213	0.149	D	mg/Kg	☼	70	38 - 111
Phenanthrene	0.069	U cn	0.213	0.159	D	mg/Kg	☼	74	49 - 113
Pyrene	0.046	U cn	0.213	0.145	D	mg/Kg	☼	68	55 - 117

Surrogate	MS %Recovery	MS Qualifier	Limits
Benzo(a)pyrene-d12 (Surr)	75		19 - 133
Fluoranthene-d10 (Surr)	65		22 - 152
1-Methylnaphthalene-d10 (Surr)	70		26 - 123

Lab Sample ID: 410-106216-3 MSD
Matrix: Solid
Analysis Batch: 322229

Client Sample ID: NBKK-IDW07-SO-111522
Prep Type: Total/NA
Prep Batch: 321761

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
1-Methylnaphthalene	0.046	U cn	0.214	0.172	D	mg/Kg	☼	80	43 - 111	8	20
2-Methylnaphthalene	0.092	U cn	0.214	0.160	D	mg/Kg	☼	75	39 - 114	8	20
Acenaphthene	0.046	U cn	0.214	0.161	D	mg/Kg	☼	75	44 - 111	11	20
Acenaphthylene	0.046	U cn	0.214	0.153	D	mg/Kg	☼	72	39 - 116	7	20
Anthracene	0.046	U cn	0.214	0.162	D	mg/Kg	☼	76	50 - 114	8	20
Benzo[a]anthracene	0.046	U cn	0.214	0.162	D	mg/Kg	☼	76	54 - 122	8	20
Benzo[a]pyrene	0.046	U cn	0.214	0.157	D	mg/Kg	☼	74	50 - 125	8	20
Benzo[b]fluoranthene	0.046	U cn	0.214	0.154	D	mg/Kg	☼	72	53 - 128	9	20
Benzo[g,h,i]perylene	0.046	U cn	0.214	0.170	D	mg/Kg	☼	79	49 - 127	10	20
Benzo[k]fluoranthene	0.046	U cn	0.214	0.161	D	mg/Kg	☼	75	56 - 123	8	20

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Lab Sample ID: 410-106216-3 MSD
Matrix: Solid
Analysis Batch: 322229

Client Sample ID: NBKK-IDW07-SO-111522
Prep Type: Total/NA
Prep Batch: 321761

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chrysene	0.046	U cn	0.214	0.157	D	mg/Kg	☼	73	57 - 118	8	20
Dibenz(a,h)anthracene	0.046	U cn	0.214	0.181	D	mg/Kg	☼	84	50 - 129	6	20
Fluoranthene	0.046	U cn	0.214	0.159	D	mg/Kg	☼	74	55 - 119	6	20
Fluorene	0.046	U cn	0.214	0.159	D	mg/Kg	☼	74	47 - 114	5	20
Indeno[1,2,3-cd]pyrene	0.046	U cn	0.214	0.183	D M	mg/Kg	☼	86	49 - 130	10	20
Naphthalene	0.092	U cn	0.214	0.160	D	mg/Kg	☼	75	38 - 111	7	20
Phenanthrene	0.069	U cn	0.214	0.167	D	mg/Kg	☼	78	49 - 113	5	20
Pyrene	0.046	U cn	0.214	0.155	D	mg/Kg	☼	73	55 - 117	7	20

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
Benzo(a)pyrene-d12 (Surr)	*80*		*19 - 133*
Fluoranthene-d10 (Surr)	*71*		*22 - 152*
1-Methylnaphthalene-d10 (Surr)	*75*		*26 - 123*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Lab Sample ID: MB 410-319656/5
Matrix: Solid
Analysis Batch: 319656

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
C7-C12 (1C)	0.50	U	5.0	0.50	0.23	mg/Kg		11/21/22 12:44	25

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*97*		*50 - 150*		*11/21/22 12:44*	*25*

Lab Sample ID: LCS 410-319656/6
Matrix: Solid
Analysis Batch: 319656

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
C7-C12 (1C)			11.0	9.28	D	mg/Kg		84	55 - 145		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid) (1C)	*87*		*50 - 150*

Lab Sample ID: LCSD 410-319656/7
Matrix: Solid
Analysis Batch: 319656

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
C7-C12 (1C)			11.0	9.49	D	mg/Kg		86	55 - 145	2	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid) (1C)	*87*		*50 - 150*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC) (Continued)

Lab Sample ID: MB 410-320618/5
Matrix: Solid
Analysis Batch: 320618

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
C7-C12 (1C)	0.50	U	5.0	0.50	0.23	mg/Kg		11/23/22 13:19	25

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*100*		*50 - 150*		*11/23/22 13:19*	*25*

Lab Sample ID: LCS 410-320618/6
Matrix: Solid
Analysis Batch: 320618

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
C7-C12 (1C)			11.0	11.4	D	mg/Kg		104	55 - 145		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid) (1C)	*100*		*50 - 150*

Lab Sample ID: LCSD 410-320618/7
Matrix: Solid
Analysis Batch: 320618

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
C7-C12 (1C)			11.0	11.3	D	mg/Kg		103	55 - 145	1	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid) (1C)	*99*		*50 - 150*

Lab Sample ID: MB 410-320624/5
Matrix: Solid
Analysis Batch: 320624

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
C7-C12 (1C)	0.50	U	5.0	0.50	0.23	mg/Kg		11/23/22 13:28	25

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*112*		*50 - 150*		*11/23/22 13:28*	*25*

Lab Sample ID: LCS 410-320624/6
Matrix: Solid
Analysis Batch: 320624

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
C7-C12 (1C)			11.0	13.0	D	mg/Kg		118	55 - 145		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid) (1C)	*109*		*50 - 150*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC) (Continued)

Lab Sample ID: LCSD 410-320624/7
Matrix: Solid
Analysis Batch: 320624

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
C7-C12 (1C)			11.0	13.2	D	mg/Kg		120	55 - 145	1	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid) (1C)	*111*		*50 - 150*

Lab Sample ID: MB 410-321593/9
Matrix: Solid
Analysis Batch: 321593

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
C7-C12 (1C)	0.50	U	5.0	0.50	0.23	mg/Kg		11/29/22 15:14	25

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*108*		*50 - 150*		*11/29/22 15:14*	*25*

Lab Sample ID: LCS 410-321593/6
Matrix: Solid
Analysis Batch: 321593

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
C7-C12 (1C)			11.0	10.7	D	mg/Kg		98	55 - 145		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid) (1C)	*94*		*50 - 150*

Lab Sample ID: LCSD 410-321593/7
Matrix: Solid
Analysis Batch: 321593

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
C7-C12 (1C)			11.0	11.0	D	mg/Kg		100	55 - 145	2	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid) (1C)	*96*		*50 - 150*

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Lab Sample ID: MB 410-321539/1-A
Matrix: Solid
Analysis Batch: 321845

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 321539

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
PCB-1016 (1C)	0.010	U	0.017	0.010	0.0053	mg/Kg		11/29/22 17:24	1
PCB-1221 (1C)	0.010	U	0.017	0.010	0.0053	mg/Kg		11/29/22 17:24	1
PCB-1232 (1C)	0.010	U	0.017	0.010	0.0053	mg/Kg		11/29/22 17:24	1
PCB-1242 (1C)	0.010	U	0.017	0.010	0.0053	mg/Kg		11/29/22 17:24	1
PCB-1248 (1C)	0.010	U	0.017	0.010	0.0053	mg/Kg		11/29/22 17:24	1
PCB-1254 (1C)	0.010	U	0.017	0.010	0.0064	mg/Kg		11/29/22 17:24	1

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography (Continued)

Lab Sample ID: MB 410-321539/1-A
Matrix: Solid
Analysis Batch: 321845

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 321539

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
PCB-1260 (1C)	0.010	U	0.017	0.010	0.0064	mg/Kg		11/29/22 17:24	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene (1C)	*86*		*44 - 130*	*11/29/22 09:14*	*11/29/22 17:24*	*1*
Tetrachloro-m-xylene (2C)	*87*		*44 - 130*	*11/29/22 09:14*	*11/29/22 17:24*	*1*
DCB Decachlorobiphenyl (Surr) (1C)	*80*		*66 - 130*	*11/29/22 09:14*	*11/29/22 17:24*	*1*
DCB Decachlorobiphenyl (Surr) (2C)	*95*		*66 - 130*	*11/29/22 09:14*	*11/29/22 17:24*	*1*

Lab Sample ID: LCS 410-321539/2-A
Matrix: Solid
Analysis Batch: 321845

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 321539

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
PCB-1016 (1C)			0.167	0.146		mg/Kg		87	47 - 134		
PCB-1260 (1C)			0.167	0.160		mg/Kg		95	53 - 140		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Tetrachloro-m-xylene (1C)	*87*		*44 - 130*
Tetrachloro-m-xylene (2C)	*88*		*44 - 130*
DCB Decachlorobiphenyl (Surr) (1C)	*81*		*66 - 130*
DCB Decachlorobiphenyl (Surr) (2C)	*99*		*66 - 130*

Lab Sample ID: 410-106216-2 MS
Matrix: Solid
Analysis Batch: 321845

Client Sample ID: NBKK-IDW06-SO-111522
Prep Type: Total/NA
Prep Batch: 321539

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
PCB-1016 (1C)	0.012	U	0.201	0.167		mg/Kg	☼	83	47 - 134		
PCB-1260 (1C)	0.012	U M	0.202	0.179		mg/Kg	☼	89	53 - 140		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Tetrachloro-m-xylene (1C)	*82*		*44 - 130*
Tetrachloro-m-xylene (2C)	*83*		*44 - 130*
DCB Decachlorobiphenyl (Surr) (1C)	*76*		*66 - 130*
DCB Decachlorobiphenyl (Surr) (2C)	*90*		*66 - 130*

Lab Sample ID: 410-106216-2 MSD
Matrix: Solid
Analysis Batch: 321845

Client Sample ID: NBKK-IDW06-SO-111522
Prep Type: Total/NA
Prep Batch: 321539

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
PCB-1016 (1C)	0.012	U	0.201	0.169		mg/Kg	☼	84	47 - 134	1	30
PCB-1260 (1C)	0.012	U M	0.201	0.177		mg/Kg	☼	88	53 - 140	1	30

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography (Continued)

Lab Sample ID: 410-106216-2 MSD
Matrix: Solid
Analysis Batch: 321845

Client Sample ID: NBKK-IDW06-SO-111522
Prep Type: Total/NA
Prep Batch: 321539

Surrogate	MSD %Recovery	MSD Qualifier	Limits
Tetrachloro-m-xylene (1C)	*85*		*44 - 130*
Tetrachloro-m-xylene (2C)	*87*		*44 - 130*
DCB Decachlorobiphenyl (Surr) (1C)	*77*		*66 - 130*
DCB Decachlorobiphenyl (Surr) (2C)	*96*		*66 - 130*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Lab Sample ID: MB 410-321051/1-A
Matrix: Solid
Analysis Batch: 321741

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 321051

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
C12-C24	8.0	U M	10	8.0	4.0	mg/Kg		11/29/22 21:17	1
C24-C40	20	U M	30	20	10	mg/Kg		11/29/22 21:17	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
o- terphenyl (Surr)	*99*		*50 - 150*	*11/28/22 09:26*	*11/29/22 21:17*	*1*

Lab Sample ID: LCS 410-321051/2-A
Matrix: Solid
Analysis Batch: 321741

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 321051

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
C12-C24			133	106	M	mg/Kg		79	74 - 115		

Surrogate	LCS %Recovery	LCS Qualifier	Limits
o- terphenyl (Surr)	*109*		*50 - 150*

Lab Sample ID: 410-106216-5 MS
Matrix: Solid
Analysis Batch: 321741

Client Sample ID: NBKK-IDW09-SO-111522
Prep Type: Total/NA
Prep Batch: 321051

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
C12-C24	32	J1 M	154	135	M J1	mg/Kg	☼	67	74 - 115		

Surrogate	MS %Recovery	MS Qualifier	Limits
o- terphenyl (Surr)	*112*		*50 - 150*

Lab Sample ID: 410-106216-5 DU
Matrix: Solid
Analysis Batch: 321741

Client Sample ID: NBKK-IDW09-SO-111522
Prep Type: Total/NA
Prep Batch: 321051

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
C12-C24	32	J1 M		18.3	J1 M	mg/Kg	☼			54	20
C24-C40	250	M		169	J1 M	mg/Kg	☼			40	20

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC) (Continued)

Lab Sample ID: 410-106216-5 DU
Matrix: Solid
Analysis Batch: 321741

Client Sample ID: NBKK-IDW09-SO-111522
Prep Type: Total/NA
Prep Batch: 321051

Surrogate	DU %Recovery	DU Qualifier	Limits
o- terphenyl (Surr)	105		50 - 150

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 410-319529/1-A ^2
Matrix: Solid
Analysis Batch: 324328

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 319529

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	0.32	U	0.40	0.32	0.13	mg/Kg		12/06/22 18:00	2
Barium	0.36	U	0.40	0.36	0.18	mg/Kg		12/06/22 18:00	2
Cadmium	0.080	U	0.10	0.080	0.040	mg/Kg		12/06/22 18:00	2
Chromium	0.30	U	0.40	0.30	0.15	mg/Kg		12/06/22 18:00	2
Copper	0.30	U	0.40	0.30	0.088	mg/Kg		12/06/22 18:00	2
Lead	0.16	U	0.20	0.16	0.076	mg/Kg		12/06/22 18:00	2
Nickel	0.32	U	0.40	0.32	0.16	mg/Kg		12/06/22 18:00	2
Selenium	0.20	U	0.40	0.20	0.10	mg/Kg		12/06/22 18:00	2
Silver	0.080	U	0.10	0.080	0.041	mg/Kg		12/06/22 18:00	2
Zinc	8.0	U	30	8.0	4.0	mg/Kg		12/06/22 18:00	2

Lab Sample ID: LCS 410-319529/2-A ^2
Matrix: Solid
Analysis Batch: 324328

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 319529

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	50.0	47.8	D	mg/Kg		96	82 - 118
Barium	50.0	50.3	D	mg/Kg		101	86 - 116
Cadmium	5.00	4.97	D	mg/Kg		99	84 - 116
Chromium	50.0	50.7	D	mg/Kg		101	83 - 119
Copper	50.0	50.2	D	mg/Kg		100	84 - 119
Lead	5.00	4.96	D	mg/Kg		99	84 - 118
Nickel	50.0	49.4	D	mg/Kg		99	84 - 119
Selenium	10.0	10.0	D	mg/Kg		100	80 - 119
Silver	5.00	4.99	D	mg/Kg		100	83 - 118
Zinc	50.0	49.8	D	mg/Kg		100	82 - 119

Lab Sample ID: MB 410-322927/1-A
Matrix: Solid
Analysis Batch: 325460

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 322927

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	17	U	20	17	6.8	ug/L		12/09/22 08:00	1
Barium	16	U	20	16	7.5	ug/L		12/09/22 08:00	1
Cadmium	4.0	U	5.0	4.0	1.5	ug/L		12/09/22 08:00	1
Chromium	8.0	U	20	8.0	3.3	ug/L		12/09/22 08:00	1
Lead	2.0	U	5.0	2.0	0.71	ug/L		12/09/22 08:00	1
Selenium	6.0	U	10	6.0	2.8	ug/L		12/09/22 08:00	1
Silver	3.0	U	5.0	3.0	1.0	ug/L		12/09/22 08:00	1

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 410-322927/2-A
Matrix: Solid
Analysis Batch: 325460

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 322927

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	5000	4760		ug/L		95	84 - 116
Barium	5000	5020		ug/L		100	86 - 114
Cadmium	500	511		ug/L		102	87 - 115
Chromium	5000	5270		ug/L		105	85 - 116
Lead	500	495		ug/L		99	88 - 115
Selenium	1000	1010		ug/L		101	80 - 120
Silver	500	506		ug/L		101	85 - 116

Lab Sample ID: MB 410-322973/1-A
Matrix: Solid
Analysis Batch: 328034

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 322973

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	17	U	20	17	6.8	ug/L		12/16/22 14:33	1
Barium	16	U	20	16	7.5	ug/L		12/16/22 14:33	1
Cadmium	4.0	U	5.0	4.0	1.5	ug/L		12/16/22 14:33	1
Chromium	8.0	U	20	8.0	3.3	ug/L		12/16/22 14:33	1
Lead	2.0	U	5.0	2.0	0.71	ug/L		12/16/22 14:33	1
Selenium	6.0	U	10	6.0	2.8	ug/L		12/16/22 14:33	1
Silver	3.0	U	5.0	3.0	1.0	ug/L		12/16/22 14:33	1

Lab Sample ID: LCS 410-322973/2-A
Matrix: Solid
Analysis Batch: 328034

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 322973

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	5000	4990		ug/L		100	84 - 116
Barium	5000	5120		ug/L		102	86 - 114
Cadmium	500	515		ug/L		103	87 - 115
Chromium	5000	5210		ug/L		104	85 - 116
Lead	500	532		ug/L		106	88 - 115
Selenium	1000	1040		ug/L		104	80 - 120
Silver	500	484		ug/L		97	85 - 116

Lab Sample ID: LB 410-321569/1-D
Matrix: Solid
Analysis Batch: 325460

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 322927

Analyte	LB Result	LB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	17	U	20	17	6.8	ug/L		12/09/22 08:36	1
Barium	16	U	20	16	7.5	ug/L		12/09/22 08:36	1
Cadmium	4.0	U	5.0	4.0	1.5	ug/L		12/09/22 08:36	1
Chromium	8.0	U	20	8.0	3.3	ug/L		12/09/22 08:36	1
Lead	0.710	J	5.0	2.0	0.71	ug/L		12/09/22 08:36	1
Selenium	6.0	U	10	6.0	2.8	ug/L		12/09/22 08:36	1
Silver	3.0	U	5.0	3.0	1.0	ug/L		12/09/22 08:36	1

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: 410-106216-1 MS
Matrix: Solid
Analysis Batch: 328034

Client Sample ID: NBKK-IDW05-SO-111522
Prep Type: TCLP
Prep Batch: 322973

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	17	U	5000	4310	D	ug/L		86	84 - 116
Barium	450	J1	100000	81600	J1 D	ug/L		81	86 - 114
Cadmium	3.8	J1	1000	819	J1 D	ug/L		82	87 - 115
Chromium	7.1	J	5000	4440	D	ug/L		89	85 - 116
Lead	1300	J1	5000	5290	J1 D	ug/L		81	88 - 115
Selenium	6.0	U	1000	921	J D	ug/L		92	80 - 120
Silver	3.0	U J1	5000	3620	J1 D	ug/L		72	85 - 116

Lab Sample ID: 410-106216-1 MSD
Matrix: Solid
Analysis Batch: 328034

Client Sample ID: NBKK-IDW05-SO-111522
Prep Type: TCLP
Prep Batch: 322973

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic	17	U	5000	5110	D	ug/L		102	84 - 116	17	20
Barium	450	J1	100000	95000	D	ug/L		95	86 - 114	15	20
Cadmium	3.8	J1	1000	965	D	ug/L		96	87 - 115	16	20
Chromium	7.1	J	5000	4890	D	ug/L		98	85 - 116	10	20
Lead	1300	J1	5000	6220	D	ug/L		99	88 - 115	16	20
Selenium	6.0	U	1000	1110	D	ug/L		111	80 - 120	18	20
Silver	3.0	U J1	5000	4260	D	ug/L		85	85 - 116	16	20

Lab Sample ID: 410-106216-1 DU
Matrix: Solid
Analysis Batch: 328034

Client Sample ID: NBKK-IDW05-SO-111522
Prep Type: TCLP
Prep Batch: 322973

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Arsenic	17	U	17	U	ug/L		NC	20
Barium	450	J1	416		ug/L		7	20
Cadmium	3.8	J1	2.94	J	ug/L		25	20
Chromium	7.1	J	12.9	J	ug/L		59	20
Lead	1300	J1	1210		ug/L		4	20
Selenium	6.0	U	6.0	U	ug/L		NC	20
Silver	3.0	U J1	3.0	U	ug/L		NC	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 410-323036/1-A
Matrix: Solid
Analysis Batch: 323493

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 323036

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	0.16	U	0.20	0.16	0.079	ug/L		12/04/22 13:27	1

Lab Sample ID: LCS 410-323036/2-A
Matrix: Solid
Analysis Batch: 323493

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 323036

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	1.00	0.996		ug/L		100	82 - 119

Method: 7470A - Mercury (CVAA) (Continued)

Lab Sample ID: MB 410-323048/1-A
Matrix: Solid
Analysis Batch: 323493

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 323048

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	0.16	U	0.20	0.16	0.079	ug/L		12/04/22 14:15	1

Lab Sample ID: LCS 410-323048/2-A
Matrix: Solid
Analysis Batch: 323493

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 323048

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	1.00	1.05		ug/L		105	82 - 119

Lab Sample ID: 410-106216-1 MS
Matrix: Solid
Analysis Batch: 323493

Client Sample ID: NBKK-IDW05-SO-111522
Prep Type: TCLP
Prep Batch: 323036

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.094	J1	20.0	12.1	J1	ug/L		60	82 - 119

Lab Sample ID: 410-106216-1 MSD
Matrix: Solid
Analysis Batch: 323493

Client Sample ID: NBKK-IDW05-SO-111522
Prep Type: TCLP
Prep Batch: 323036

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	0.094	J1	20.0	12.2	J1	ug/L		61	82 - 119	1	20

Lab Sample ID: 410-106216-1 DU
Matrix: Solid
Analysis Batch: 323493

Client Sample ID: NBKK-IDW05-SO-111522
Prep Type: TCLP
Prep Batch: 323036

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Mercury	0.094	J1	0.102	J	ug/L		8	20

Method: 7471B - Mercury (CVAA)

Lab Sample ID: MB 410-319534/1-A
Matrix: Solid
Analysis Batch: 319866

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 319534

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	0.024	U	0.036	0.024	0.012	mg/Kg		11/21/22 13:46	1

Lab Sample ID: LCS 410-319534/2-A
Matrix: Solid
Analysis Batch: 319866

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 319534

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.100	0.102		mg/Kg		102	80 - 124

Method: 1010A - Ignitability, Pensky-Martens Closed-Cup Method

Lab Sample ID: LCS 410-320896/1
Matrix: Solid
Analysis Batch: 320896

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Flashpoint	81.0	83.00		Degrees F		102	96.9 - 103.1

Lab Sample ID: LCSD 410-320896/2
Matrix: Solid
Analysis Batch: 320896

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Flashpoint	81.0	81.00		Degrees F		100	96.9 - 103.1	2	4

Method: 9012 - Cyanide, Reactive

Lab Sample ID: MB 410-322008/1-A
Matrix: Solid
Analysis Batch: 322479

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 322008

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Cyanide, Reactive	50	U	60	50	20	mg/Kg		11/30/22 17:10	1

Lab Sample ID: LCS 410-322008/2-A
Matrix: Solid
Analysis Batch: 322479

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 322008

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Cyanide, Reactive	1000	500	U	mg/Kg		2	0 - 5.14

Lab Sample ID: 410-106216-6 MS
Matrix: Solid
Analysis Batch: 322479

Client Sample ID: NBKK-IDW10-SO-111522
Prep Type: Total/NA
Prep Batch: 322008

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Cyanide, Reactive	49	U Q cn	973	240	U Q	mg/Kg		0	0 - 44

Lab Sample ID: 410-106216-6 MSD
Matrix: Solid
Analysis Batch: 322479

Client Sample ID: NBKK-IDW10-SO-111522
Prep Type: Total/NA
Prep Batch: 322008

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Cyanide, Reactive	49	U Q cn	975	240	U Q	mg/Kg		0	0 - 44	NC	11

Method: 9034 - Sulfide, Reactive

Lab Sample ID: MB 410-322008/1-A
Matrix: Solid
Analysis Batch: 322194

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 322008

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Sulfide, Reactive	140	U	160	140	54	mg/Kg		11/30/22 13:10	1

Method: 9034 - Sulfide, Reactive (Continued)

Lab Sample ID: LCS 410-322008/25-A
Matrix: Solid
Analysis Batch: 322194

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 322008

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Sulfide, Reactive			538	471		mg/Kg		88	56 - 104		

Lab Sample ID: 410-106216-6 MS
Matrix: Solid
Analysis Batch: 322194

Client Sample ID: NBKK-IDW10-SO-111522
Prep Type: Total/NA
Prep Batch: 322008

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Sulfide, Reactive	140	U cn	532	466		mg/Kg		88	56 - 104		

Lab Sample ID: 410-106216-6 MSD
Matrix: Solid
Analysis Batch: 322194

Client Sample ID: NBKK-IDW10-SO-111522
Prep Type: Total/NA
Prep Batch: 322008

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Sulfide, Reactive	140	U cn	535	459		mg/Kg		86	56 - 104	2	52

GC/MS VOA

Leach Batch: 321687

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-106216-1	NBKK-IDW05-SO-111522	TCLP	Solid	1311	
410-106216-2	NBKK-IDW06-SO-111522	TCLP	Solid	1311	
410-106216-3	NBKK-IDW07-SO-111522	TCLP	Solid	1311	
410-106216-4	NBKK-IDW08-SO-111522	TCLP	Solid	1311	
410-106216-5	NBKK-IDW09-SO-111522	TCLP	Solid	1311	
410-106216-6	NBKK-IDW10-SO-111522	TCLP	Solid	1311	

Analysis Batch: 323476

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-106216-1	NBKK-IDW05-SO-111522	TCLP	Solid	8260D	321687
410-106216-2	NBKK-IDW06-SO-111522	TCLP	Solid	8260D	321687
410-106216-3	NBKK-IDW07-SO-111522	TCLP	Solid	8260D	321687
410-106216-4	NBKK-IDW08-SO-111522	TCLP	Solid	8260D	321687
410-106216-5	NBKK-IDW09-SO-111522	TCLP	Solid	8260D	321687
410-106216-6	NBKK-IDW10-SO-111522	TCLP	Solid	8260D	321687
MB 410-323476/30	Method Blank	Total/NA	Solid	8260D	
LCS 410-323476/4	Lab Control Sample	Total/NA	Solid	8260D	

GC/MS Semi VOA

Leach Batch: 321569

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-106216-1	NBKK-IDW05-SO-111522	TCLP	Solid	1311	
410-106216-2	NBKK-IDW06-SO-111522	TCLP	Solid	1311	
410-106216-3	NBKK-IDW07-SO-111522	TCLP	Solid	1311	
410-106216-4	NBKK-IDW08-SO-111522	TCLP	Solid	1311	
410-106216-5	NBKK-IDW09-SO-111522	TCLP	Solid	1311	
410-106216-5 - RE	NBKK-IDW09-SO-111522	TCLP	Solid	1311	
410-106216-6	NBKK-IDW10-SO-111522	TCLP	Solid	1311	
410-106216-1 MS	NBKK-IDW05-SO-111522	TCLP	Solid	1311	
410-106216-1 MSD	NBKK-IDW05-SO-111522	TCLP	Solid	1311	

Prep Batch: 321761

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-106216-1	NBKK-IDW05-SO-111522	Total/NA	Solid	3546	
410-106216-2	NBKK-IDW06-SO-111522	Total/NA	Solid	3546	
410-106216-3	NBKK-IDW07-SO-111522	Total/NA	Solid	3546	
410-106216-4	NBKK-IDW08-SO-111522	Total/NA	Solid	3546	
410-106216-5	NBKK-IDW09-SO-111522	Total/NA	Solid	3546	
410-106216-6	NBKK-IDW10-SO-111522	Total/NA	Solid	3546	
MB 410-321761/1-A	Method Blank	Total/NA	Solid	3546	
LCS 410-321761/2-A	Lab Control Sample	Total/NA	Solid	3546	
410-106216-3 MS	NBKK-IDW07-SO-111522	Total/NA	Solid	3546	
410-106216-3 MSD	NBKK-IDW07-SO-111522	Total/NA	Solid	3546	

Analysis Batch: 322229

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-106216-1	NBKK-IDW05-SO-111522	Total/NA	Solid	8270E SIM	321761
410-106216-2	NBKK-IDW06-SO-111522	Total/NA	Solid	8270E SIM	321761
410-106216-3	NBKK-IDW07-SO-111522	Total/NA	Solid	8270E SIM	321761
410-106216-4	NBKK-IDW08-SO-111522	Total/NA	Solid	8270E SIM	321761

GC/MS Semi VOA (Continued)

Analysis Batch: 322229 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-106216-5	NBKK-IDW09-SO-111522	Total/NA	Solid	8270E SIM	321761
410-106216-6	NBKK-IDW10-SO-111522	Total/NA	Solid	8270E SIM	321761
MB 410-321761/1-A	Method Blank	Total/NA	Solid	8270E SIM	321761
LCS 410-321761/2-A	Lab Control Sample	Total/NA	Solid	8270E SIM	321761
410-106216-3 MS	NBKK-IDW07-SO-111522	Total/NA	Solid	8270E SIM	321761
410-106216-3 MSD	NBKK-IDW07-SO-111522	Total/NA	Solid	8270E SIM	321761

Prep Batch: 324430

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-106216-1	NBKK-IDW05-SO-111522	TCLP	Solid	3510C	321569
410-106216-2	NBKK-IDW06-SO-111522	TCLP	Solid	3510C	321569
410-106216-3	NBKK-IDW07-SO-111522	TCLP	Solid	3510C	321569
410-106216-4	NBKK-IDW08-SO-111522	TCLP	Solid	3510C	321569
410-106216-5	NBKK-IDW09-SO-111522	TCLP	Solid	3510C	321569
410-106216-6	NBKK-IDW10-SO-111522	TCLP	Solid	3510C	321569
MB 410-324430/1-A	Method Blank	Total/NA	Solid	3510C	
LCS 410-324430/2-A	Lab Control Sample	Total/NA	Solid	3510C	
410-106216-1 MS	NBKK-IDW05-SO-111522	TCLP	Solid	3510C	321569
410-106216-1 MSD	NBKK-IDW05-SO-111522	TCLP	Solid	3510C	321569

Analysis Batch: 324707

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-106216-1	NBKK-IDW05-SO-111522	TCLP	Solid	8270E	324430
410-106216-2	NBKK-IDW06-SO-111522	TCLP	Solid	8270E	324430
410-106216-3	NBKK-IDW07-SO-111522	TCLP	Solid	8270E	324430
410-106216-4	NBKK-IDW08-SO-111522	TCLP	Solid	8270E	324430
410-106216-5	NBKK-IDW09-SO-111522	TCLP	Solid	8270E	324430
410-106216-6	NBKK-IDW10-SO-111522	TCLP	Solid	8270E	324430
MB 410-324430/1-A	Method Blank	Total/NA	Solid	8270E	324430
LCS 410-324430/2-A	Lab Control Sample	Total/NA	Solid	8270E	324430
410-106216-1 MS	NBKK-IDW05-SO-111522	TCLP	Solid	8270E	324430
410-106216-1 MSD	NBKK-IDW05-SO-111522	TCLP	Solid	8270E	324430

Prep Batch: 325576

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-106216-5 - RE	NBKK-IDW09-SO-111522	TCLP	Solid	3510C	321569
MB 410-325576/1-A	Method Blank	Total/NA	Solid	3510C	
LCS 410-325576/2-A	Lab Control Sample	Total/NA	Solid	3510C	

Analysis Batch: 325794

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-106216-5 - RE	NBKK-IDW09-SO-111522	TCLP	Solid	8270E	325576
MB 410-325576/1-A	Method Blank	Total/NA	Solid	8270E	325576
LCS 410-325576/2-A	Lab Control Sample	Total/NA	Solid	8270E	325576

GC VOA

Prep Batch: 319518

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-106216-1	NBKK-IDW05-SO-111522	Total/NA	Solid	5035	
410-106216-2	NBKK-IDW06-SO-111522	Total/NA	Solid	5035	

GC VOA (Continued)

Prep Batch: 319518 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-106216-3	NBKK-IDW07-SO-111522	Total/NA	Solid	5035	
410-106216-4	NBKK-IDW08-SO-111522	Total/NA	Solid	5035	
410-106216-6	NBKK-IDW10-SO-111522	Total/NA	Solid	5035	

Analysis Batch: 319656

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-106216-1	NBKK-IDW05-SO-111522	Total/NA	Solid	NWTPH-Gx	319518
410-106216-2	NBKK-IDW06-SO-111522	Total/NA	Solid	NWTPH-Gx	319518
410-106216-3	NBKK-IDW07-SO-111522	Total/NA	Solid	NWTPH-Gx	319518
410-106216-4	NBKK-IDW08-SO-111522	Total/NA	Solid	NWTPH-Gx	319518
MB 410-319656/5	Method Blank	Total/NA	Solid	NWTPH-Gx	
LCS 410-319656/6	Lab Control Sample	Total/NA	Solid	NWTPH-Gx	
LCSD 410-319656/7	Lab Control Sample Dup	Total/NA	Solid	NWTPH-Gx	

Prep Batch: 319984

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-106216-5	NBKK-IDW09-SO-111522	Total/NA	Solid	5030C	

Analysis Batch: 320618

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-106216-5	NBKK-IDW09-SO-111522	Total/NA	Solid	NWTPH-Gx	319984
MB 410-320618/5	Method Blank	Total/NA	Solid	NWTPH-Gx	
LCS 410-320618/6	Lab Control Sample	Total/NA	Solid	NWTPH-Gx	
LCSD 410-320618/7	Lab Control Sample Dup	Total/NA	Solid	NWTPH-Gx	

Analysis Batch: 320624

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-106216-6	NBKK-IDW10-SO-111522	Total/NA	Solid	NWTPH-Gx	319518
MB 410-320624/5	Method Blank	Total/NA	Solid	NWTPH-Gx	
LCS 410-320624/6	Lab Control Sample	Total/NA	Solid	NWTPH-Gx	
LCSD 410-320624/7	Lab Control Sample Dup	Total/NA	Solid	NWTPH-Gx	

Analysis Batch: 321593

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-106216-6	NBKK-IDW10-SO-111522	Total/NA	Solid	NWTPH-Gx	321805
MB 410-321593/9	Method Blank	Total/NA	Solid	NWTPH-Gx	
LCS 410-321593/6	Lab Control Sample	Total/NA	Solid	NWTPH-Gx	
LCSD 410-321593/7	Lab Control Sample Dup	Total/NA	Solid	NWTPH-Gx	

Prep Batch: 321805

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-106216-6	NBKK-IDW10-SO-111522	Total/NA	Solid	5030C	

GC Semi VOA

Prep Batch: 321051

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-106216-1	NBKK-IDW05-SO-111522	Total/NA	Solid	3550C	
410-106216-2	NBKK-IDW06-SO-111522	Total/NA	Solid	3550C	
410-106216-3	NBKK-IDW07-SO-111522	Total/NA	Solid	3550C	
410-106216-4	NBKK-IDW08-SO-111522	Total/NA	Solid	3550C	

GC Semi VOA (Continued)

Prep Batch: 321051 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-106216-5	NBKK-IDW09-SO-111522	Total/NA	Solid	3550C	
410-106216-6	NBKK-IDW10-SO-111522	Total/NA	Solid	3550C	
MB 410-321051/1-A	Method Blank	Total/NA	Solid	3550C	
LCS 410-321051/2-A	Lab Control Sample	Total/NA	Solid	3550C	
410-106216-5 MS	NBKK-IDW09-SO-111522	Total/NA	Solid	3550C	
410-106216-5 DU	NBKK-IDW09-SO-111522	Total/NA	Solid	3550C	

Prep Batch: 321539

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-106216-1	NBKK-IDW05-SO-111522	Total/NA	Solid	3546	
410-106216-2	NBKK-IDW06-SO-111522	Total/NA	Solid	3546	
410-106216-3	NBKK-IDW07-SO-111522	Total/NA	Solid	3546	
410-106216-4	NBKK-IDW08-SO-111522	Total/NA	Solid	3546	
410-106216-5	NBKK-IDW09-SO-111522	Total/NA	Solid	3546	
410-106216-6	NBKK-IDW10-SO-111522	Total/NA	Solid	3546	
MB 410-321539/1-A	Method Blank	Total/NA	Solid	3546	
LCS 410-321539/2-A	Lab Control Sample	Total/NA	Solid	3546	
410-106216-2 MS	NBKK-IDW06-SO-111522	Total/NA	Solid	3546	
410-106216-2 MSD	NBKK-IDW06-SO-111522	Total/NA	Solid	3546	

Analysis Batch: 321741

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-106216-1	NBKK-IDW05-SO-111522	Total/NA	Solid	NWTPH-Dx	321051
410-106216-2	NBKK-IDW06-SO-111522	Total/NA	Solid	NWTPH-Dx	321051
410-106216-3	NBKK-IDW07-SO-111522	Total/NA	Solid	NWTPH-Dx	321051
410-106216-4	NBKK-IDW08-SO-111522	Total/NA	Solid	NWTPH-Dx	321051
410-106216-5	NBKK-IDW09-SO-111522	Total/NA	Solid	NWTPH-Dx	321051
410-106216-6	NBKK-IDW10-SO-111522	Total/NA	Solid	NWTPH-Dx	321051
MB 410-321051/1-A	Method Blank	Total/NA	Solid	NWTPH-Dx	321051
LCS 410-321051/2-A	Lab Control Sample	Total/NA	Solid	NWTPH-Dx	321051
410-106216-5 MS	NBKK-IDW09-SO-111522	Total/NA	Solid	NWTPH-Dx	321051
410-106216-5 DU	NBKK-IDW09-SO-111522	Total/NA	Solid	NWTPH-Dx	321051

Analysis Batch: 321845

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-106216-1	NBKK-IDW05-SO-111522	Total/NA	Solid	8082A	321539
410-106216-2	NBKK-IDW06-SO-111522	Total/NA	Solid	8082A	321539
410-106216-3	NBKK-IDW07-SO-111522	Total/NA	Solid	8082A	321539
410-106216-4	NBKK-IDW08-SO-111522	Total/NA	Solid	8082A	321539
410-106216-5	NBKK-IDW09-SO-111522	Total/NA	Solid	8082A	321539
410-106216-6	NBKK-IDW10-SO-111522	Total/NA	Solid	8082A	321539
MB 410-321539/1-A	Method Blank	Total/NA	Solid	8082A	321539
LCS 410-321539/2-A	Lab Control Sample	Total/NA	Solid	8082A	321539
410-106216-2 MS	NBKK-IDW06-SO-111522	Total/NA	Solid	8082A	321539
410-106216-2 MSD	NBKK-IDW06-SO-111522	Total/NA	Solid	8082A	321539

Metals

Prep Batch: 319529

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-106216-1	NBKK-IDW05-SO-111522	Total/NA	Solid	3050B	

Metals (Continued)

Prep Batch: 319529 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-106216-2	NBKK-IDW06-SO-111522	Total/NA	Solid	3050B	
410-106216-3	NBKK-IDW07-SO-111522	Total/NA	Solid	3050B	
410-106216-4	NBKK-IDW08-SO-111522	Total/NA	Solid	3050B	
410-106216-5	NBKK-IDW09-SO-111522	Total/NA	Solid	3050B	
410-106216-6	NBKK-IDW10-SO-111522	Total/NA	Solid	3050B	
MB 410-319529/1-A ^2	Method Blank	Total/NA	Solid	3050B	
LCS 410-319529/2-A ^2	Lab Control Sample	Total/NA	Solid	3050B	

Prep Batch: 319534

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-106216-1	NBKK-IDW05-SO-111522	Total/NA	Solid	7471B	
410-106216-2	NBKK-IDW06-SO-111522	Total/NA	Solid	7471B	
410-106216-3	NBKK-IDW07-SO-111522	Total/NA	Solid	7471B	
410-106216-4	NBKK-IDW08-SO-111522	Total/NA	Solid	7471B	
410-106216-5	NBKK-IDW09-SO-111522	Total/NA	Solid	7471B	
410-106216-6	NBKK-IDW10-SO-111522	Total/NA	Solid	7471B	
MB 410-319534/1-A	Method Blank	Total/NA	Solid	7471B	
LCS 410-319534/2-A	Lab Control Sample	Total/NA	Solid	7471B	

Analysis Batch: 319866

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-106216-1	NBKK-IDW05-SO-111522	Total/NA	Solid	7471B	319534
410-106216-2	NBKK-IDW06-SO-111522	Total/NA	Solid	7471B	319534
410-106216-3	NBKK-IDW07-SO-111522	Total/NA	Solid	7471B	319534
410-106216-4	NBKK-IDW08-SO-111522	Total/NA	Solid	7471B	319534
410-106216-5	NBKK-IDW09-SO-111522	Total/NA	Solid	7471B	319534
410-106216-6	NBKK-IDW10-SO-111522	Total/NA	Solid	7471B	319534
MB 410-319534/1-A	Method Blank	Total/NA	Solid	7471B	319534
LCS 410-319534/2-A	Lab Control Sample	Total/NA	Solid	7471B	319534

Leach Batch: 321569

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-106216-1	NBKK-IDW05-SO-111522	TCLP	Solid	1311	
410-106216-2	NBKK-IDW06-SO-111522	TCLP	Solid	1311	
410-106216-3	NBKK-IDW07-SO-111522	TCLP	Solid	1311	
410-106216-4	NBKK-IDW08-SO-111522	TCLP	Solid	1311	
410-106216-5	NBKK-IDW09-SO-111522	TCLP	Solid	1311	
410-106216-6	NBKK-IDW10-SO-111522	TCLP	Solid	1311	
LB 410-321569/1-D	Method Blank	TCLP	Solid	1311	
410-106216-1 MS	NBKK-IDW05-SO-111522	TCLP	Solid	1311	
410-106216-1 MSD	NBKK-IDW05-SO-111522	TCLP	Solid	1311	
410-106216-1 DU	NBKK-IDW05-SO-111522	TCLP	Solid	1311	

Prep Batch: 322927

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-106216-2	NBKK-IDW06-SO-111522	TCLP	Solid	3005A	321569
410-106216-6	NBKK-IDW10-SO-111522	TCLP	Solid	3005A	321569
LB 410-321569/1-D	Method Blank	TCLP	Solid	3005A	321569
MB 410-322927/1-A	Method Blank	Total Recoverable	Solid	3005A	
LCS 410-322927/2-A	Lab Control Sample	Total Recoverable	Solid	3005A	

Metals

Prep Batch: 322973

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-106216-1	NBKK-IDW05-SO-111522	TCLP	Solid	3005A	321569
410-106216-3	NBKK-IDW07-SO-111522	TCLP	Solid	3005A	321569
410-106216-4	NBKK-IDW08-SO-111522	TCLP	Solid	3005A	321569
410-106216-5	NBKK-IDW09-SO-111522	TCLP	Solid	3005A	321569
MB 410-322973/1-A	Method Blank	Total Recoverable	Solid	3005A	
LCS 410-322973/2-A	Lab Control Sample	Total Recoverable	Solid	3005A	
410-106216-1 MS	NBKK-IDW05-SO-111522	TCLP	Solid	3005A	321569
410-106216-1 MSD	NBKK-IDW05-SO-111522	TCLP	Solid	3005A	321569
410-106216-1 DU	NBKK-IDW05-SO-111522	TCLP	Solid	3005A	321569

Prep Batch: 323036

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-106216-1	NBKK-IDW05-SO-111522	TCLP	Solid	7470A	321569
410-106216-3	NBKK-IDW07-SO-111522	TCLP	Solid	7470A	321569
410-106216-4	NBKK-IDW08-SO-111522	TCLP	Solid	7470A	321569
410-106216-5	NBKK-IDW09-SO-111522	TCLP	Solid	7470A	321569
MB 410-323036/1-A	Method Blank	Total/NA	Solid	7470A	
LCS 410-323036/2-A	Lab Control Sample	Total/NA	Solid	7470A	
410-106216-1 MS	NBKK-IDW05-SO-111522	TCLP	Solid	7470A	321569
410-106216-1 MSD	NBKK-IDW05-SO-111522	TCLP	Solid	7470A	321569
410-106216-1 DU	NBKK-IDW05-SO-111522	TCLP	Solid	7470A	321569

Prep Batch: 323048

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-106216-2	NBKK-IDW06-SO-111522	TCLP	Solid	7470A	321569
410-106216-6	NBKK-IDW10-SO-111522	TCLP	Solid	7470A	321569
MB 410-323048/1-A	Method Blank	Total/NA	Solid	7470A	
LCS 410-323048/2-A	Lab Control Sample	Total/NA	Solid	7470A	

Analysis Batch: 323493

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-106216-1	NBKK-IDW05-SO-111522	TCLP	Solid	7470A	323036
410-106216-2	NBKK-IDW06-SO-111522	TCLP	Solid	7470A	323048
410-106216-3	NBKK-IDW07-SO-111522	TCLP	Solid	7470A	323036
410-106216-4	NBKK-IDW08-SO-111522	TCLP	Solid	7470A	323036
410-106216-5	NBKK-IDW09-SO-111522	TCLP	Solid	7470A	323036
410-106216-6	NBKK-IDW10-SO-111522	TCLP	Solid	7470A	323048
MB 410-323036/1-A	Method Blank	Total/NA	Solid	7470A	323036
MB 410-323048/1-A	Method Blank	Total/NA	Solid	7470A	323048
LCS 410-323036/2-A	Lab Control Sample	Total/NA	Solid	7470A	323036
LCS 410-323048/2-A	Lab Control Sample	Total/NA	Solid	7470A	323048
410-106216-1 MS	NBKK-IDW05-SO-111522	TCLP	Solid	7470A	323036
410-106216-1 MSD	NBKK-IDW05-SO-111522	TCLP	Solid	7470A	323036
410-106216-1 DU	NBKK-IDW05-SO-111522	TCLP	Solid	7470A	323036

Analysis Batch: 324328

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-106216-1	NBKK-IDW05-SO-111522	Total/NA	Solid	6020B	319529
410-106216-2	NBKK-IDW06-SO-111522	Total/NA	Solid	6020B	319529
410-106216-3	NBKK-IDW07-SO-111522	Total/NA	Solid	6020B	319529
410-106216-4	NBKK-IDW08-SO-111522	Total/NA	Solid	6020B	319529

Metals (Continued)

Analysis Batch: 324328 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-106216-5	NBKK-IDW09-SO-111522	Total/NA	Solid	6020B	319529
410-106216-6	NBKK-IDW10-SO-111522	Total/NA	Solid	6020B	319529
MB 410-319529/1-A ^2	Method Blank	Total/NA	Solid	6020B	319529
LCS 410-319529/2-A ^2	Lab Control Sample	Total/NA	Solid	6020B	319529

Analysis Batch: 325460

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-106216-2	NBKK-IDW06-SO-111522	TCLP	Solid	6020B	322927
410-106216-6	NBKK-IDW10-SO-111522	TCLP	Solid	6020B	322927
LB 410-321569/1-D	Method Blank	TCLP	Solid	6020B	322927
MB 410-322927/1-A	Method Blank	Total Recoverable	Solid	6020B	322927
LCS 410-322927/2-A	Lab Control Sample	Total Recoverable	Solid	6020B	322927

Analysis Batch: 328034

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-106216-1	NBKK-IDW05-SO-111522	TCLP	Solid	6020B	322973
410-106216-3	NBKK-IDW07-SO-111522	TCLP	Solid	6020B	322973
410-106216-4	NBKK-IDW08-SO-111522	TCLP	Solid	6020B	322973
410-106216-5	NBKK-IDW09-SO-111522	TCLP	Solid	6020B	322973
MB 410-322973/1-A	Method Blank	Total Recoverable	Solid	6020B	322973
LCS 410-322973/2-A	Lab Control Sample	Total Recoverable	Solid	6020B	322973
410-106216-1 MS	NBKK-IDW05-SO-111522	TCLP	Solid	6020B	322973
410-106216-1 MSD	NBKK-IDW05-SO-111522	TCLP	Solid	6020B	322973
410-106216-1 DU	NBKK-IDW05-SO-111522	TCLP	Solid	6020B	322973

General Chemistry

Analysis Batch: 319522

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-106216-1	NBKK-IDW05-SO-111522	Total/NA	Solid	Moisture	
410-106216-2	NBKK-IDW06-SO-111522	Total/NA	Solid	Moisture	
410-106216-3	NBKK-IDW07-SO-111522	Total/NA	Solid	Moisture	
410-106216-4	NBKK-IDW08-SO-111522	Total/NA	Solid	Moisture	
410-106216-5	NBKK-IDW09-SO-111522	Total/NA	Solid	Moisture	
410-106216-6	NBKK-IDW10-SO-111522	Total/NA	Solid	Moisture	

Analysis Batch: 320896

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-106216-1	NBKK-IDW05-SO-111522	Total/NA	Solid	1010A	
410-106216-2	NBKK-IDW06-SO-111522	Total/NA	Solid	1010A	
410-106216-3	NBKK-IDW07-SO-111522	Total/NA	Solid	1010A	
410-106216-4	NBKK-IDW08-SO-111522	Total/NA	Solid	1010A	
410-106216-5	NBKK-IDW09-SO-111522	Total/NA	Solid	1010A	
410-106216-6	NBKK-IDW10-SO-111522	Total/NA	Solid	1010A	
LCS 410-320896/1	Lab Control Sample	Total/NA	Solid	1010A	
LCSD 410-320896/2	Lab Control Sample Dup	Total/NA	Solid	1010A	

Prep Batch: 322008

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-106216-1	NBKK-IDW05-SO-111522	Total/NA	Solid	7.3.4	
410-106216-2	NBKK-IDW06-SO-111522	Total/NA	Solid	7.3.4	

General Chemistry (Continued)

Prep Batch: 322008 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-106216-3	NBKK-IDW07-SO-111522	Total/NA	Solid	7.3.4	
410-106216-4	NBKK-IDW08-SO-111522	Total/NA	Solid	7.3.4	
410-106216-5	NBKK-IDW09-SO-111522	Total/NA	Solid	7.3.4	
410-106216-6	NBKK-IDW10-SO-111522	Total/NA	Solid	7.3.4	
MB 410-322008/1-A	Method Blank	Total/NA	Solid	7.3.4	
LCS 410-322008/25-A	Lab Control Sample	Total/NA	Solid	7.3.4	
LCS 410-322008/2-A	Lab Control Sample	Total/NA	Solid	7.3.4	
410-106216-6 MS	NBKK-IDW10-SO-111522	Total/NA	Solid	7.3.4	
410-106216-6 MS	NBKK-IDW10-SO-111522	Total/NA	Solid	7.3.4	
410-106216-6 MSD	NBKK-IDW10-SO-111522	Total/NA	Solid	7.3.4	
410-106216-6 MSD	NBKK-IDW10-SO-111522	Total/NA	Solid	7.3.4	

Analysis Batch: 322194

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-106216-1	NBKK-IDW05-SO-111522	Total/NA	Solid	9034	322008
410-106216-2	NBKK-IDW06-SO-111522	Total/NA	Solid	9034	322008
410-106216-3	NBKK-IDW07-SO-111522	Total/NA	Solid	9034	322008
410-106216-4	NBKK-IDW08-SO-111522	Total/NA	Solid	9034	322008
410-106216-5	NBKK-IDW09-SO-111522	Total/NA	Solid	9034	322008
410-106216-6	NBKK-IDW10-SO-111522	Total/NA	Solid	9034	322008
MB 410-322008/1-A	Method Blank	Total/NA	Solid	9034	322008
LCS 410-322008/25-A	Lab Control Sample	Total/NA	Solid	9034	322008
410-106216-6 MS	NBKK-IDW10-SO-111522	Total/NA	Solid	9034	322008
410-106216-6 MSD	NBKK-IDW10-SO-111522	Total/NA	Solid	9034	322008

Analysis Batch: 322479

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-106216-1	NBKK-IDW05-SO-111522	Total/NA	Solid	9012	322008
410-106216-2	NBKK-IDW06-SO-111522	Total/NA	Solid	9012	322008
410-106216-3	NBKK-IDW07-SO-111522	Total/NA	Solid	9012	322008
410-106216-4	NBKK-IDW08-SO-111522	Total/NA	Solid	9012	322008
410-106216-5	NBKK-IDW09-SO-111522	Total/NA	Solid	9012	322008
410-106216-6	NBKK-IDW10-SO-111522	Total/NA	Solid	9012	322008
MB 410-322008/1-A	Method Blank	Total/NA	Solid	9012	322008
LCS 410-322008/2-A	Lab Control Sample	Total/NA	Solid	9012	322008
410-106216-6 MS	NBKK-IDW10-SO-111522	Total/NA	Solid	9012	322008
410-106216-6 MSD	NBKK-IDW10-SO-111522	Total/NA	Solid	9012	322008

Client Sample ID: NBKK-IDW05-SO-111522

Lab Sample ID: 410-106216-1

Date Collected: 11/15/22 09:50

Matrix: Solid

Date Received: 11/17/22 10:05

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
TCLP	Leach	1311			321687	UNWS	ELLE	11/29/22 14:00 - 11/30/22 07:20 [1]
TCLP	Analysis	8260D		20	323476	K4WN	ELLE	12/04/22 19:01
TCLP	Leach	1311			321569	UNWS	ELLE	11/29/22 17:28 - 11/30/22 10:04 [1]
TCLP	Prep	3510C			324430	YDF5	ELLE	12/07/22 07:57
TCLP	Analysis	8270E		1	324707	AH7C	ELLE	12/07/22 17:58
TCLP	Leach	1311			321569	UNWS	ELLE	11/29/22 17:28 - 11/30/22 10:04 [1]
TCLP	Prep	3005A			322973	HUH3	ELLE	12/02/22 09:01
TCLP	Analysis	6020B		1	328034	S4PD	ELLE	12/16/22 14:37
TCLP	Leach	1311			321569	UNWS	ELLE	11/29/22 17:28 - 11/30/22 10:04 [1]
TCLP	Prep	7470A			323036	UAMX	ELLE	12/02/22 10:32
TCLP	Analysis	7470A		1	323493	UEFS	ELLE	12/04/22 13:35
Total/NA	Analysis	1010A		1	320896	USAE	ELLE	11/26/22 06:35 - 11/26/22 06:35 [1]
Total/NA	Prep	7.3.4			322008	USE1	ELLE	11/30/22 07:57
Total/NA	Analysis	9012		1	322479	JCG7	ELLE	11/30/22 17:15
Total/NA	Prep	7.3.4			322008	USE1	ELLE	11/30/22 07:57
Total/NA	Analysis	9034		1	322194	USE1	ELLE	11/30/22 13:10
Total/NA	Analysis	Moisture		1	319522	USWF	ELLE	11/20/22 21:55

Client Sample ID: NBKK-IDW05-SO-111522

Lab Sample ID: 410-106216-1

Date Collected: 11/15/22 09:50

Matrix: Solid

Date Received: 11/17/22 10:05

Percent Solids: 87.7

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3546			321761	MD4W	ELLE	11/29/22 15:15
Total/NA	Analysis	8270E SIM		1	322229	UJM0	ELLE	11/30/22 21:52
Total/NA	Prep	5035			319518	D8NM	ELLE	11/20/22 20:22
Total/NA	Analysis	NWTPH-Gx		25	319656	MXX6	ELLE	11/22/22 00:41
Total/NA	Prep	3546			321539	LJG2	ELLE	11/29/22 09:14
Total/NA	Analysis	8082A		1	321845	E9VJ	ELLE	11/29/22 20:22
Total/NA	Prep	3550C			321051	A2VL	ELLE	11/28/22 09:26
Total/NA	Analysis	NWTPH-Dx		1	321741	KP5X	ELLE	11/29/22 21:57
Total/NA	Prep	3050B			319529	UAMX	ELLE	11/21/22 04:08
Total/NA	Analysis	6020B		2	324328	UCIG	ELLE	12/06/22 18:24
Total/NA	Prep	7471B			319534	UAMX	ELLE	11/21/22 04:40
Total/NA	Analysis	7471B		1	319866	UEFS	ELLE	11/21/22 14:18

Client Sample ID: NBKK-IDW06-SO-111522

Lab Sample ID: 410-106216-2

Date Collected: 11/15/22 10:45

Matrix: Solid

Date Received: 11/17/22 10:05

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
TCLP	Leach	1311			321687	UNWS	ELLE	11/29/22 14:00 - 11/30/22 07:20 [1]
TCLP	Analysis	8260D		20	323476	K4WN	ELLE	12/04/22 19:21

Client Sample ID: NBKK-IDW06-SO-111522

Lab Sample ID: 410-106216-2

Date Collected: 11/15/22 10:45

Matrix: Solid

Date Received: 11/17/22 10:05

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
TCLP	Leach	1311			321569	UNWS	ELLE	11/29/22 17:28 - 11/30/22 10:04 [1]
TCLP	Prep	3510C			324430	YDF5	ELLE	12/07/22 07:57
TCLP	Analysis	8270E		1	324707	AH7C	ELLE	12/07/22 19:01
TCLP	Leach	1311			321569	UNWS	ELLE	11/29/22 17:28 - 11/30/22 10:04 [1]
TCLP	Prep	3005A			322927	HUH3	ELLE	12/02/22 08:07
TCLP	Analysis	6020B		1	325460	F7JF	ELLE	12/09/22 08:40
TCLP	Leach	1311			321569	UNWS	ELLE	11/29/22 17:28 - 11/30/22 10:04 [1]
TCLP	Prep	7470A			323048	UAMX	ELLE	12/02/22 10:54
TCLP	Analysis	7470A		1	323493	UEFS	ELLE	12/04/22 15:02
Total/NA	Analysis	1010A		1	320896	USAE	ELLE	11/26/22 06:35 - 11/26/22 06:35 [1]
Total/NA	Prep	7.3.4			322008	USE1	ELLE	11/30/22 07:57
Total/NA	Analysis	9012		1	322479	JCG7	ELLE	11/30/22 17:16
Total/NA	Prep	7.3.4			322008	USE1	ELLE	11/30/22 07:57
Total/NA	Analysis	9034		1	322194	USE1	ELLE	11/30/22 13:10
Total/NA	Analysis	Moisture		1	319522	USWF	ELLE	11/20/22 21:55

Client Sample ID: NBKK-IDW06-SO-111522

Lab Sample ID: 410-106216-2

Date Collected: 11/15/22 10:45

Matrix: Solid

Date Received: 11/17/22 10:05

Percent Solids: 82.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3546			321761	MD4W	ELLE	11/29/22 15:15
Total/NA	Analysis	8270E SIM		1	322229	UJM0	ELLE	11/30/22 22:16
Total/NA	Prep	5035			319518	D8NM	ELLE	11/20/22 20:31
Total/NA	Analysis	NWTPH-Gx		25	319656	MXX6	ELLE	11/22/22 01:17
Total/NA	Prep	3546			321539	LJG2	ELLE	11/29/22 09:14
Total/NA	Analysis	8082A		1	321845	E9VJ	ELLE	11/29/22 20:33
Total/NA	Prep	3550C			321051	A2VL	ELLE	11/28/22 09:26
Total/NA	Analysis	NWTPH-Dx		1	321741	KP5X	ELLE	11/29/22 22:17
Total/NA	Prep	3050B			319529	UAMX	ELLE	11/21/22 04:08
Total/NA	Analysis	6020B		2	324328	UCIG	ELLE	12/06/22 18:28
Total/NA	Prep	7471B			319534	UAMX	ELLE	11/21/22 04:40
Total/NA	Analysis	7471B		1	319866	UEFS	ELLE	11/21/22 14:20

Client Sample ID: NBKK-IDW07-SO-111522

Lab Sample ID: 410-106216-3

Date Collected: 11/15/22 11:45

Matrix: Solid

Date Received: 11/17/22 10:05

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
TCLP	Leach	1311			321687	UNWS	ELLE	11/29/22 14:00 - 11/30/22 07:20 [1]
TCLP	Analysis	8260D		20	323476	K4WN	ELLE	12/04/22 19:41
TCLP	Leach	1311			321569	UNWS	ELLE	11/29/22 17:28 - 11/30/22 10:04 [1]
TCLP	Prep	3510C			324430	YDF5	ELLE	12/07/22 07:57
TCLP	Analysis	8270E		1	324707	AH7C	ELLE	12/07/22 19:22

Client Sample ID: NBKK-IDW07-SO-111522

Lab Sample ID: 410-106216-3

Date Collected: 11/15/22 11:45

Matrix: Solid

Date Received: 11/17/22 10:05

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
TCLP	Leach	1311			321569	UNWS	ELLE	11/29/22 17:28 - 11/30/22 10:04 [1]
TCLP	Prep	3005A			322973	HUH3	ELLE	12/02/22 09:01
TCLP	Analysis	6020B		1	328034	S4PD	ELLE	12/16/22 14:55
TCLP	Leach	1311			321569	UNWS	ELLE	11/29/22 17:28 - 11/30/22 10:04 [1]
TCLP	Prep	7470A			323036	UAMX	ELLE	12/02/22 10:32
TCLP	Analysis	7470A		1	323493	UEFS	ELLE	12/04/22 13:45
Total/NA	Analysis	1010A		1	320896	USAE	ELLE	11/26/22 06:35 - 11/26/22 06:35 [1]
Total/NA	Prep	7.3.4			322008	USE1	ELLE	11/30/22 07:57
Total/NA	Analysis	9012		1	322479	JCG7	ELLE	11/30/22 17:17
Total/NA	Prep	7.3.4			322008	USE1	ELLE	11/30/22 07:57
Total/NA	Analysis	9034		1	322194	USE1	ELLE	11/30/22 13:10
Total/NA	Analysis	Moisture		1	319522	USWF	ELLE	11/20/22 21:55

Client Sample ID: NBKK-IDW07-SO-111522

Lab Sample ID: 410-106216-3

Date Collected: 11/15/22 11:45

Matrix: Solid

Date Received: 11/17/22 10:05

Percent Solids: 86.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3546			321761	MD4W	ELLE	11/29/22 15:15
Total/NA	Analysis	8270E SIM		5	322229	UJM0	ELLE	11/30/22 22:39
Total/NA	Prep	5035			319518	D8NM	ELLE	11/20/22 20:31
Total/NA	Analysis	NWTPH-Gx		25	319656	MXX6	ELLE	11/22/22 02:01
Total/NA	Prep	3546			321539	LJG2	ELLE	11/29/22 09:14
Total/NA	Analysis	8082A		1	321845	E9VJ	ELLE	11/29/22 20:43
Total/NA	Prep	3550C			321051	A2VL	ELLE	11/28/22 09:26
Total/NA	Analysis	NWTPH-Dx		1	321741	KP5X	ELLE	11/29/22 22:56
Total/NA	Prep	3050B			319529	UAMX	ELLE	11/21/22 04:08
Total/NA	Analysis	6020B		2	324328	UCIG	ELLE	12/06/22 18:50
Total/NA	Prep	7471B			319534	UAMX	ELLE	11/21/22 04:40
Total/NA	Analysis	7471B		1	319866	UEFS	ELLE	11/21/22 14:22

Client Sample ID: NBKK-IDW08-SO-111522

Lab Sample ID: 410-106216-4

Date Collected: 11/15/22 13:15

Matrix: Solid

Date Received: 11/17/22 10:05

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
TCLP	Leach	1311			321687	UNWS	ELLE	11/29/22 14:00 - 11/30/22 07:20 [1]
TCLP	Analysis	8260D		20	323476	K4WN	ELLE	12/04/22 20:01
TCLP	Leach	1311			321569	UNWS	ELLE	11/29/22 17:28 - 11/30/22 10:04 [1]
TCLP	Prep	3510C			324430	YDF5	ELLE	12/07/22 07:57
TCLP	Analysis	8270E		1	324707	AH7C	ELLE	12/07/22 19:43
TCLP	Leach	1311			321569	UNWS	ELLE	11/29/22 17:28 - 11/30/22 10:04 [1]
TCLP	Prep	3005A			322973	HUH3	ELLE	12/02/22 09:01
TCLP	Analysis	6020B		1	328034	S4PD	ELLE	12/16/22 14:57

Client Sample ID: NBKK-IDW08-SO-111522

Lab Sample ID: 410-106216-4

Date Collected: 11/15/22 13:15

Matrix: Solid

Date Received: 11/17/22 10:05

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
TCLP	Leach	1311			321569	UNWS	ELLE	11/29/22 17:28 - 11/30/22 10:04 [1]
TCLP	Prep	7470A			323036	UAMX	ELLE	12/02/22 10:32
TCLP	Analysis	7470A		1	323493	UEFS	ELLE	12/04/22 13:47
Total/NA	Analysis	1010A		1	320896	USAE	ELLE	11/26/22 06:35 - 11/26/22 06:35 [1]
Total/NA	Prep	7.3.4			322008	USE1	ELLE	11/30/22 07:57
Total/NA	Analysis	9012		1	322479	JCG7	ELLE	11/30/22 17:22
Total/NA	Prep	7.3.4			322008	USE1	ELLE	11/30/22 07:57
Total/NA	Analysis	9034		1	322194	USE1	ELLE	11/30/22 13:10
Total/NA	Analysis	Moisture		1	319522	USWF	ELLE	11/20/22 21:55

Client Sample ID: NBKK-IDW08-SO-111522

Lab Sample ID: 410-106216-4

Date Collected: 11/15/22 13:15

Matrix: Solid

Date Received: 11/17/22 10:05

Percent Solids: 79.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3546			321761	MD4W	ELLE	11/29/22 15:15
Total/NA	Analysis	8270E SIM		5	322229	UJM0	ELLE	11/30/22 23:50
Total/NA	Prep	5035			319518	D8NM	ELLE	11/20/22 20:31
Total/NA	Analysis	NWTPH-Gx		25	319656	MXX6	ELLE	11/22/22 02:37
Total/NA	Prep	3546			321539	LJG2	ELLE	11/29/22 09:14
Total/NA	Analysis	8082A		1	321845	E9VJ	ELLE	11/29/22 20:54
Total/NA	Prep	3550C			321051	A2VL	ELLE	11/28/22 09:26
Total/NA	Analysis	NWTPH-Dx		1	321741	KP5X	ELLE	11/29/22 23:16
Total/NA	Prep	3050B			319529	UAMX	ELLE	11/21/22 04:08
Total/NA	Analysis	6020B		2	324328	UCIG	ELLE	12/06/22 18:46
Total/NA	Prep	7471B			319534	UAMX	ELLE	11/21/22 04:40
Total/NA	Analysis	7471B		1	319866	UEFS	ELLE	11/21/22 14:24

Client Sample ID: NBKK-IDW09-SO-111522

Lab Sample ID: 410-106216-5

Date Collected: 11/15/22 14:00

Matrix: Solid

Date Received: 11/17/22 10:05

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
TCLP	Leach	1311			321687	UNWS	ELLE	11/29/22 14:00 - 11/30/22 07:20 [1]
TCLP	Analysis	8260D		20	323476	K4WN	ELLE	12/04/22 20:21
TCLP	Leach	1311			321569	UNWS	ELLE	11/29/22 17:28 - 11/30/22 10:04 [1]
TCLP	Prep	3510C			324430	YDF5	ELLE	12/07/22 07:57
TCLP	Analysis	8270E		1	324707	AH7C	ELLE	12/07/22 20:04
TCLP	Leach	1311	RE		321569	UNWS	ELLE	11/29/22 17:28 - 11/30/22 10:04 [1]
TCLP	Prep	3510C	RE		325576	T9CY	ELLE	12/09/22 17:20
TCLP	Analysis	8270E	RE	1	325794	AH7C	ELLE	12/11/22 16:09
TCLP	Leach	1311			321569	UNWS	ELLE	11/29/22 17:28 - 11/30/22 10:04 [1]
TCLP	Prep	3005A			322973	HUH3	ELLE	12/02/22 09:01
TCLP	Analysis	6020B		1	328034	S4PD	ELLE	12/16/22 14:59

Client Sample ID: NBKK-IDW09-SO-111522

Lab Sample ID: 410-106216-5

Date Collected: 11/15/22 14:00

Matrix: Solid

Date Received: 11/17/22 10:05

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
TCLP	Leach	1311			321569	UNWS	ELLE	11/29/22 17:28 - 11/30/22 10:04 [1]
TCLP	Prep	7470A			323036	UAMX	ELLE	12/02/22 10:32
TCLP	Analysis	7470A		1	323493	UEFS	ELLE	12/04/22 13:49
Total/NA	Analysis	1010A		1	320896	USAE	ELLE	11/26/22 06:35 - 11/26/22 06:35 [1]
Total/NA	Prep	7.3.4			322008	USE1	ELLE	11/30/22 07:57
Total/NA	Analysis	9012		1	322479	JCG7	ELLE	11/30/22 17:23
Total/NA	Prep	7.3.4			322008	USE1	ELLE	11/30/22 07:57
Total/NA	Analysis	9034		1	322194	USE1	ELLE	11/30/22 13:10
Total/NA	Analysis	Moisture		1	319522	USWF	ELLE	11/20/22 21:55

Client Sample ID: NBKK-IDW09-SO-111522

Lab Sample ID: 410-106216-5

Date Collected: 11/15/22 14:00

Matrix: Solid

Date Received: 11/17/22 10:05

Percent Solids: 85.5

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3546			321761	MD4W	ELLE	11/29/22 15:15
Total/NA	Analysis	8270E SIM		5	322229	UJM0	ELLE	12/01/22 00:14
Total/NA	Prep	5030C			319984	D8NM	ELLE	11/21/22 18:28
Total/NA	Analysis	NWTPH-Gx		25	320618	MXX6	ELLE	11/23/22 15:51
Total/NA	Prep	3546			321539	LJG2	ELLE	11/29/22 09:14
Total/NA	Analysis	8082A		1	321845	E9VJ	ELLE	11/29/22 21:04
Total/NA	Prep	3550C			321051	A2VL	ELLE	11/28/22 09:26
Total/NA	Analysis	NWTPH-Dx		1	321741	KP5X	ELLE	11/29/22 23:56
Total/NA	Prep	3050B			319529	UAMX	ELLE	11/21/22 04:08
Total/NA	Analysis	6020B		2	324328	UCIG	ELLE	12/06/22 18:36
Total/NA	Prep	7471B			319534	UAMX	ELLE	11/21/22 04:40
Total/NA	Analysis	7471B		1	319866	UEFS	ELLE	11/21/22 14:01

Client Sample ID: NBKK-IDW10-SO-111522

Lab Sample ID: 410-106216-6

Date Collected: 11/15/22 14:40

Matrix: Solid

Date Received: 11/17/22 10:05

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
TCLP	Leach	1311			321687	UNWS	ELLE	11/29/22 14:00 - 11/30/22 07:20 [1]
TCLP	Analysis	8260D		20	323476	K4WN	ELLE	12/04/22 20:40
TCLP	Leach	1311			321569	UNWS	ELLE	11/29/22 17:28 - 11/30/22 10:04 [1]
TCLP	Prep	3510C			324430	YDF5	ELLE	12/07/22 07:57
TCLP	Analysis	8270E		1	324707	AH7C	ELLE	12/07/22 20:26
TCLP	Leach	1311			321569	UNWS	ELLE	11/29/22 17:28 - 11/30/22 10:04 [1]
TCLP	Prep	3005A			322927	HUH3	ELLE	12/02/22 08:07
TCLP	Analysis	6020B		1	325460	F7JF	ELLE	12/09/22 08:26
TCLP	Leach	1311			321569	UNWS	ELLE	11/29/22 17:28 - 11/30/22 10:04 [1]
TCLP	Prep	7470A			323048	UAMX	ELLE	12/02/22 10:54
TCLP	Analysis	7470A		1	323493	UEFS	ELLE	12/04/22 14:48
Total/NA	Analysis	1010A		1	320896	USAE	ELLE	11/26/22 06:35 - 11/26/22 06:35 [1]

Lab Chronicle

Client: Jacobs Engineering Group, Inc.
Project/Site: NBK Keyport

Job ID: 410-106216-1

Client Sample ID: NBKK-IDW10-SO-111522
Date Collected: 11/15/22 14:40
Date Received: 11/17/22 10:05

Lab Sample ID: 410-106216-6
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	7.3.4			322008	USE1	ELLE	11/30/22 07:57
Total/NA	Analysis	9012		1	322479	JCG7	ELLE	11/30/22 17:24
Total/NA	Prep	7.3.4			322008	USE1	ELLE	11/30/22 07:57
Total/NA	Analysis	9034		1	322194	USE1	ELLE	11/30/22 13:10
Total/NA	Analysis	Moisture		1	319522	USWF	ELLE	11/20/22 21:55

Client Sample ID: NBKK-IDW10-SO-111522
Date Collected: 11/15/22 14:40
Date Received: 11/17/22 10:05

Lab Sample ID: 410-106216-6
Matrix: Solid
Percent Solids: 84.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3546			321761	MD4W	ELLE	11/29/22 15:15
Total/NA	Analysis	8270E SIM		5	322229	UJM0	ELLE	12/01/22 00:37
Total/NA	Prep	5035			319518	D8NM	ELLE	11/20/22 20:31
Total/NA	Analysis	NWTPH-Gx		200	320624	MXX6	ELLE	11/23/22 16:40
Total/NA	Prep	5030C			321805	D8NM	ELLE	11/29/22 16:08
Total/NA	Analysis	NWTPH-Gx		25	321593	MXX6	ELLE	11/29/22 22:56
Total/NA	Prep	3546			321539	LJG2	ELLE	11/29/22 09:14
Total/NA	Analysis	8082A		1	321845	E9VJ	ELLE	11/29/22 21:15
Total/NA	Prep	3550C			321051	A2VL	ELLE	11/28/22 09:26
Total/NA	Analysis	NWTPH-Dx		1	321741	KP5X	ELLE	11/29/22 22:36
Total/NA	Prep	3050B			319529	UAMX	ELLE	11/21/22 04:08
Total/NA	Analysis	6020B		2	324328	UCIG	ELLE	12/06/22 18:32
Total/NA	Prep	7471B			319534	UAMX	ELLE	11/21/22 04:40
Total/NA	Analysis	7471B		1	319866	UEFS	ELLE	11/21/22 14:03

[1] Completion dates and times are reported or not reported per method requirements or individual lab discretion.

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Environment Testing, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Accreditation/Certification Summary

Client: Jacobs Engineering Group, Inc. Job ID: 410-106216-1
Project/Site: NBK Keyport

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
A2LA	Dept. of Defense ELAP	0001.01	11-30-24

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
7470A	7470A	Solid	Mercury
9012	7.3.4	Solid	Cyanide, Reactive
Moisture		Solid	Percent Moisture
Moisture		Solid	Percent Solids

Washington	State	C457	04-11-23

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
6020B	3005A	Solid	Arsenic
6020B	3005A	Solid	Barium
6020B	3005A	Solid	Cadmium
6020B	3005A	Solid	Chromium
6020B	3005A	Solid	Lead
6020B	3005A	Solid	Selenium
6020B	3005A	Solid	Silver
6020B	3050B	Solid	Arsenic
6020B	3050B	Solid	Barium
6020B	3050B	Solid	Cadmium
6020B	3050B	Solid	Chromium
6020B	3050B	Solid	Copper
6020B	3050B	Solid	Lead
6020B	3050B	Solid	Nickel
6020B	3050B	Solid	Selenium
6020B	3050B	Solid	Silver
6020B	3050B	Solid	Zinc
7470A	7470A	Solid	Mercury
7471B	7471B	Solid	Mercury
8082A	3546	Solid	PCB-1016 (1C)
8082A	3546	Solid	PCB-1221 (1C)
8082A	3546	Solid	PCB-1232 (1C)
8082A	3546	Solid	PCB-1242 (1C)
8082A	3546	Solid	PCB-1248 (1C)
8082A	3546	Solid	PCB-1254 (1C)
8082A	3546	Solid	PCB-1260 (1C)
8260D		Solid	1,1-Dichloroethene
8260D		Solid	1,2-Dichloroethane
8260D		Solid	2-Butanone
8260D		Solid	Benzene
8260D		Solid	Carbon tetrachloride
8260D		Solid	Chlorobenzene
8260D		Solid	Chloroform
8260D		Solid	Tetrachloroethene
8260D		Solid	Trichloroethene
8260D		Solid	Vinyl chloride
8270E	3510C	Solid	1,4-Dichlorobenzene

Client: Jacobs Engineering Group, Inc. Job ID: 410-106216-1
Project/Site: NBK Keyport

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC (Continued)

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
8270E	3510C	Solid	2,4,5-Trichlorophenol
8270E	3510C	Solid	2,4,6-Trichlorophenol
8270E	3510C	Solid	2,4-Dinitrotoluene
8270E	3510C	Solid	2-Methylphenol
8270E	3510C	Solid	4-Methylphenol
8270E	3510C	Solid	Hexachlorobenzene
8270E	3510C	Solid	Hexachlorobutadiene
8270E	3510C	Solid	Hexachloroethane
8270E	3510C	Solid	Nitrobenzene
8270E	3510C	Solid	Pentachlorophenol
8270E	3510C	Solid	Pyridine
8270E SIM	3546	Solid	1-Methylnaphthalene
8270E SIM	3546	Solid	2-Methylnaphthalene
8270E SIM	3546	Solid	Acenaphthene
8270E SIM	3546	Solid	Acenaphthylene
8270E SIM	3546	Solid	Anthracene
8270E SIM	3546	Solid	Benzo[a]anthracene
8270E SIM	3546	Solid	Benzo[a]pyrene
8270E SIM	3546	Solid	Benzo[b]fluoranthene
8270E SIM	3546	Solid	Benzo[g,h,i]perylene
8270E SIM	3546	Solid	Benzo[k]fluoranthene
8270E SIM	3546	Solid	Chrysene
8270E SIM	3546	Solid	Dibenz(a,h)anthracene
8270E SIM	3546	Solid	Fluoranthene
8270E SIM	3546	Solid	Fluorene
8270E SIM	3546	Solid	Indeno[1,2,3-cd]pyrene
8270E SIM	3546	Solid	Naphthalene
8270E SIM	3546	Solid	Phenanthrene
8270E SIM	3546	Solid	Pyrene
9012	7.3.4	Solid	Cyanide, Reactive
9034	7.3.4	Solid	Sulfide, Reactive
Moisture		Solid	Percent Moisture
Moisture		Solid	Percent Solids

Method Summary

Client: Jacobs Engineering Group, Inc.
Project/Site: NBK Keyport

Job ID: 410-106216-1

Method	Method Description	Protocol	Laboratory
8260D	Volatile Organic Compounds (GC/MS)	SW846	ELLE
8270E	Semivolatile Organic Compounds (GC/MS)	SW846	ELLE
8270E SIM	Semivolatile Organic Compounds (GC/MS SIM)	SW846	ELLE
NWTPH-Gx	Northwest - Volatile Petroleum Products (GC)	NWTPH	ELLE
8082A	Polychlorinated Biphenyls (PCBs) by Gas Chromatography	SW846	ELLE
NWTPH-Dx	Northwest - Semi-Volatile Petroleum Products (GC)	NWTPH	ELLE
6020B	Metals (ICP/MS)	SW846	ELLE
7470A	Mercury (CVAA)	SW846	ELLE
7471B	Mercury (CVAA)	SW846	ELLE
1010A	Ignitability, Pensky-Martens Closed-Cup Method	SW846	ELLE
9012	Cyanide, Reactive	SW846	ELLE
9034	Sulfide, Reactive	SW846	ELLE
Moisture	Percent Moisture	EPA	ELLE
1311	TCLP Extraction	SW846	ELLE
3005A	Preparation, Total Recoverable or Dissolved Metals	SW846	ELLE
3050B	Preparation, Metals	SW846	ELLE
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	ELLE
3546	Microwave Extraction	SW846	ELLE
3550C	Ultrasonic Extraction	SW846	ELLE
5030C	Purge and Trap	SW846	ELLE
5035	Closed System Purge and Trap	SW846	ELLE
7.3.3	Cyanide, Reactive	SW846	ELLE
7.3.4	Sulfide, Reactive	SW846	ELLE
7470A	Preparation, Mercury	SW846	ELLE
7471B	Preparation, Mercury	SW846	ELLE

Protocol References:

EPA = US Environmental Protection Agency

NWTPH = Northwest Total Petroleum Hydrocarbon

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Environment Testing, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Sample Summary

Client: Jacobs Engineering Group, Inc.
Project/Site: NBK Keyport

Job ID: 410-106216-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
410-106216-1	NBKK-IDW05-SO-111522	Solid	11/15/22 09:50	11/17/22 10:05
410-106216-2	NBKK-IDW06-SO-111522	Solid	11/15/22 10:45	11/17/22 10:05
410-106216-3	NBKK-IDW07-SO-111522	Solid	11/15/22 11:45	11/17/22 10:05
410-106216-4	NBKK-IDW08-SO-111522	Solid	11/15/22 13:15	11/17/22 10:05
410-106216-5	NBKK-IDW09-SO-111522	Solid	11/15/22 14:00	11/17/22 10:05
410-106216-6	NBKK-IDW10-SO-111522	Solid	11/15/22 14:40	11/17/22 10:05

410-106216 Chain of Custody

Chain of Custody Record

eurofins | Environment Testing America

Kim Shirodi	Sampler: Nathan Lee	Lab PM: Martin, Elizabeth	Carrier Tracking No(s):	COC No:
	Phone: 541-817-5777	E-Mail: Elizabeth.Martin@Et.eurofinsus.com	State of Origin: WA	Page: 1/3
Company: Jacobs Engineering Group	PWSID:			Job #:

Address: 8735 W Higgins Rd Suite 400	Due Date Requested:	
City: Chicago	TAT Requested (days): Standard (28 days)	
State, Zip: IL, 60631	Compliance Project: Δ Yes Δ No	
Phone: 352-384-7002	PO #: Purchase Order Requested	
Email: Kim.Shirodi@Jacobs.com	WO #:	
Project Name: NBK Keyport	Project #: 41012633	
Site:	SSOW#:	

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	NWTPH GRO (Terra Core)	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
NBKK-IDW05-SO-111522	11/15/22	950	G	S			X	1	
NBKK-IDW06-SO-111522	11/15/22	1145	G	S			X	1	
NBKK-IDW07-SO-111522	11/15/22	1045	G	S			X	1	
NBKK-IDW08-SO-111522	11/15/22	1315	G	S			X	1	
NBKK-IDW09-SO-111522	11/15/22	1400	G	S			X	1	
NBKK-IDW10-SO-111522	11/15/22	1440	G	S			X	1	

Possible Hazard Identification

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Date/Time	Company	Received by	Date/Time	Company
Relinquished by: Nathan Lee Nathan Lee	11/16/22 1200	Jacobs	Fed Ex		
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 11/17/22 1005	Company

Custody Seals Intact: Δ Yes Δ No

Custody Seal No.: -

Cooler Temperature(s) °C and Other Remarks: 4.1

2425 New Holland Pike
Lancaster, PA 17601
Phone (717) 656-2300

Chain of Custody Record

eurofins | Environment Testing America

Client Information	Sampler: Nathan Lee	Lab PM: Martin, Elizabeth	Carrier Tracking No(s):	COC No:
Client Contact: Kim Shiroodi	Phone: 541-817-5777	E-Mail: Elizabeth.Martin@Et.eurofinsUS.com	State of Origin: WA	Page: 2/3
Company: Jacobs Engineering Group, Inc.	PWSID:			Job #:
Address: 8735 W Higgins Rd Suite 400	Due Date Requested:			
City: Chicago	TAT Requested (days): Standard (28 Days)			
State, Zip: IL, 60631	Compliance Project: Δ Yes Δ No			
Phone: 352-384-7002	PO #: Purchase Order Requested			
Email: Kim.Shiroodi@Jacobs.com	WO #:			
Project Name: NBK Keyport	Project #: 41012633			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8270E/6020B/7470A TCLP SVOCs + Metals	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
NBKK-IDW05-SO-111522	11/15/22	950	C	S			X	1	*16 oz containers*
NBKK-IDW07-SO-111522	11/15/22	1145	C	S			X	1	
NBKK-IDW06-SO-111522	11/15/22	1045	C	S			X	1	
NBKK-IDW08-SO-111522	11/15/22	1315	C	S			X	1	
NBKK-IDW10-SO-111522	11/15/22	1400	C	S			X	1	
NBKK-IDW09-SO-111522	11/15/22	1440	C	S			X	1	

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Nathan Lee Nathan Lee	11/16/22 1200	Jacobs	FedEx		
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 11/17/22 1005	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: 4.1

12/22/2022

2425 New Holland Pike
Lancaster, PA 17601
Phone (717) 656-2300

Chain of Custody Record

eurofins | Environment Testing America

Client Information	Sampler: Nathan Lee	Lab PM: Martin, Elizabeth	Carrier Tracking No(s):	COC No:
Client Contact: Kim Shiroodi	Phone: 541-817-5777	E-Mail: Elizabeth.Martin@et.eurofinsus.com	State of Origin: WA	Page: 3/3
Company: Jacobs Engineering Group, Inc.	PWSID:			Job #:
Address: 8735 W Higgins Rd Suite 400	Due Date Requested:	Analysis Requested		Preservation Codes:
City: Chicago	TAT Requested (days): Standard (28 Days)			A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)
State, Zip: IL, 60631	Compliance Project: Δ Yes Δ No			
Phone: 352-384-7002	PO #:			Other:
Email: Kim.Shiroodi@Jacobs.com	WO #:			
Project Name: NBK Keyport	Project #:			
Site:	SSOW#:			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8260D TCLP VOCs	PAH/PCB/NWTPHDx/Met/RCI/Moist											Total Number of containers	Special Instructions/Note:
			Preservation Code:																	
NBKK-IDW05-SO-111522	11/15/22	950	C	S			X	X											3	
NBKK-IDW06-SO-111522	11/15/22	1045	C	S			X	X											3	
NBKK-IDW07-SO-111522	11/15/22	1145	C	S			X	X											3	
NBKK-IDW08-SO-111522	11/15/22	1315	C	S			X	X											3	
NBKK-IDW09-SO-111522	11/15/22	1400	C	S			X	X											3	
NBKK-IDW10-SO-111522	11/15/22	1440	C	S			X	X											3	

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
Nathan Lee Nathan Lee (Jacobs)	11/16/22 1200	Jacobs	FedEx		
				11/17/22 1005	

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: 4.1

Login Sample Receipt Checklist

Client: Jacobs Engineering Group, Inc. Job Number: 410-106216-1

Login Number: 106216 **List Source: Eurofins Lancaster Laboratories Environment Testing, LLC**
List Number: 1
Creator: Foreman, Kai

Question	Answer	Comment
The cooler's custody seal is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable (</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	True	
Sample custody seals are intact.	N/A	
VOA sample vials do not have headspace >6mm in diameter (none, if from WV)?	N/A	

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1 2 3 4 5 6 7 8 9 10 11 12 13 14

ANALYTICAL REPORT

PREPARED FOR

Attn: Juan Acaron
Jacobs Engineering Group, Inc.
3011 SW Willston Road
Gainesville, Florida 32608-3964

Generated 12/9/2022 4:51:21 PM

JOB DESCRIPTION

NBK Keyport

JOB NUMBER

410-106221-1

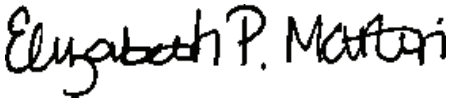
Eurofins Lancaster Laboratories Environment Testing, LLC
2425 New Holland Pike
Lancaster PA 17601

See page two for job notes and contact information.

Job Notes

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Authorization



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12/9/2022 4:51:21 PM

Authorized for release by
Elizabeth Martin, Project Manager
Elizabeth.Martin@et.eurofinsus.com
(717)205-3949

Compliance Statement

Analytical test results meet all requirements of the associated regulatory program (e.g., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis. Data qualifiers are applied to note exceptions. Noncompliant quality control (QC) is further explained in narrative comments.
· QC results that exceed the upper limits and are associated with non-detect samples are qualified but further narration is not required since the bias is high and does not change a non-detect result. Further narration is also not required with QC blank detection when the associated sample concentration is non-detect or more than ten times the level in the blank.
· Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD is performed, unless otherwise specified in the method.
· Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.
Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Measurement uncertainty values, as applicable, are available upon request.

Test results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" and tested in the laboratory are not performed within 15 minutes of collection.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. The foregoing express warranty is exclusive and is given in lieu of all other warranties, expressed or implied, except as otherwise agreed. We disclaim any other warranties, expressed or implied, including a warranty of fitness for particular purpose and warranty of merchantability. In no event shall Eurofins Lancaster Laboratories Environmental, LLC be liable for indirect, special, consequential, or incidental damages including, but not limited to, damages for loss of profit or goodwill regardless of (A) the negligence (either sole or concurrent) of Eurofins Lancaster Laboratories Environmental and (B) whether Eurofins Lancaster Laboratories Environmental has been informed of the possibility of such damages. We accept no legal responsibility for the purposes for which the client uses the test results. Except as otherwise agreed, no purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

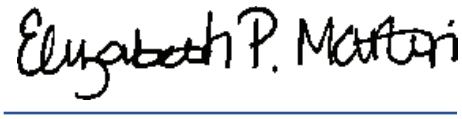

Table of Contents

Qualifiers

Subcontract

Qualifier	Qualifier Description
U	Indicates that the analyte was Not Detected (ND)

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
1C	Result is from the primary column on a dual-column method.
2C	Result is from the confirmation column on a dual-column method.
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 410-106221-1

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC

Narrative

Job Narrative
410-106221-1

Receipt
The samples were received on 11/17/2022 10:05 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 1.9°C

Receipt Exceptions
The container label for the following sample did not match the information listed on the Chain-of-Custody (COC): NBKK-IDW10-SO-111522 (410-106221-6). The container labels list NBKK-IDW10-SO-111522, while the COC lists NBKK-IDW09-SO-111522. Per client instruction 11/21/2022 1:16 PM, the ID listed on the container labels is correct for sample 410-106221-6.

SUBCONTRACTING

The following analysis was subcontracted to ALS Environmental:
Total Organic Halogens - 12-day TAT

Subcontract Lab non-Sister Lab
See attached subcontract report.

Detection Summary

Client: Jacobs Engineering Group, Inc.
Project/Site: NBK Keyport

Job ID: 410-106221-1

Client Sample ID: NBKK-IDW05-SO-111522 — Lab Sample ID: 410-106221-1

No Detections.

Client Sample ID: NBKK-IDW06-SO-111522 — Lab Sample ID: 410-106221-2

No Detections.

Client Sample ID: NBKK-IDW07-SO-111522 — Lab Sample ID: 410-106221-3

No Detections.

Client Sample ID: NBKK-IDW08-SO-111522 — Lab Sample ID: 410-106221-4

No Detections.

Client Sample ID: NBKK-IDW09-SO-111522 — Lab Sample ID: 410-106221-5

No Detections.

Client Sample ID: NBKK-IDW10-SO-111522 — Lab Sample ID: 410-106221-6

No Detections.

This Detection Summary does not include radiochemical test results.

Client Sample ID: NBKK-IDW05-SO-111522
Lab Sample ID: 410-106221-1
Date Collected: 11/15/22 09:40
Matrix: Solid
Date Received: 11/17/22 10:05
Percent Solids: 85.69

Method: EPA 9023 - Extractable Organic Halides (EOX) in Solids
Lab: ALS Environmental - Middletown, PA

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Halogen, Total Organic (TOX)	ND	U	5.7			mg/kg	☼	11/28/22 18:05	1

Client Sample ID: NBKK-IDW06-SO-111522
Lab Sample ID: 410-106221-2
Date Collected: 11/15/22 10:45
Matrix: Solid
Date Received: 11/17/22 10:05
Percent Solids: 84.15

Method: EPA 9023 - Extractable Organic Halides (EOX) in Solids
Lab: ALS Environmental - Middletown, PA

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Halogen, Total Organic (TOX)	ND	U	5.6			mg/kg	☼	11/28/22 18:05	1

Client Sample ID: NBKK-IDW07-SO-111522
Lab Sample ID: 410-106221-3
Date Collected: 11/15/22 11:45
Matrix: Solid
Date Received: 11/17/22 10:05
Percent Solids: 86.67

Method: EPA 9023 - Extractable Organic Halides (EOX) in Solids
Lab: ALS Environmental - Middletown, PA

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Halogen, Total Organic (TOX)	ND	U	5.6			mg/kg	☼	11/28/22 18:05	1

Client Sample ID: NBKK-IDW08-SO-111522
Lab Sample ID: 410-106221-4
Date Collected: 11/15/22 13:15
Matrix: Solid
Date Received: 11/17/22 10:05
Percent Solids: 86

Method: EPA 9023 - Extractable Organic Halides (EOX) in Solids
Lab: ALS Environmental - Middletown, PA

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Halogen, Total Organic (TOX)	ND	U	5.5			mg/kg	☼	11/28/22 18:05	1

Client Sample ID: NBKK-IDW09-SO-111522
Lab Sample ID: 410-106221-5
Date Collected: 11/15/22 14:00
Matrix: Solid
Date Received: 11/17/22 10:05
Percent Solids: 87.3

Method: EPA 9023 - Extractable Organic Halides (EOX) in Solids
Lab: ALS Environmental - Middletown, PA

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Halogen, Total Organic (TOX)	ND	U	5.2			mg/kg	☼	11/28/22 18:05	1

Client Sample ID: NBKK-IDW10-SO-111522
Lab Sample ID: 410-106221-6
Date Collected: 11/15/22 14:40
Matrix: Solid
Date Received: 11/17/22 10:05
Percent Solids: 79.7

Method: EPA 9023 - Extractable Organic Halides (EOX) in Solids
Lab: ALS Environmental - Middletown, PA

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Halogen, Total Organic (TOX)	ND	U	5.8			mg/kg	☼	11/28/22 18:05	1

Method: EPA 9023 - Extractable Organic Halides (EOX) in Solids

Lab Sample ID: 3591983
Matrix: QC-Solid
Analysis Batch: 913902

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 913902_P

Analyte	Blank Result	Blank Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Halogen, Total Organic (TOX)	ND	U	5			mg/kg	☼	11/28/22 18:05	1

Lab Sample ID: 3591989
Matrix: QC-Solid
Analysis Batch: 913902

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 913902_P

Analyte	Blank Result	Blank Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Halogen, Total Organic (TOX)	ND	U	5			mg/kg	☼	11/28/22 18:05	1

Lab Sample ID: 3591991
Matrix: QC-Solid
Analysis Batch: 913902

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 913902_P

Analyte	Blank Result	Blank Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Halogen, Total Organic (TOX)	ND	U	5			mg/kg	☼	11/28/22 18:05	1

Lab Sample ID: 3591984
Matrix: QC-Solid
Analysis Batch: 913902

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 913902_P

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Halogen, Total Organic (TOX)	500	525		mg/kg	☼	105	90 - 110

Lab Sample ID: 3591985
Matrix: QC-Solid
Analysis Batch: 913902

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 913902_P

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Halogen, Total Organic (TOX)	500	499		mg/kg	☼	99.8	90 - 110

Subcontract

Analysis Batch: 913902

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-106221-1	NBKK-IDW05-SO-111522	Total/NA	Solid	EPA 9023	913902_P
410-106221-2	NBKK-IDW06-SO-111522	Total/NA	Solid	EPA 9023	913902_P
410-106221-3	NBKK-IDW07-SO-111522	Total/NA	Solid	EPA 9023	913902_P
410-106221-4	NBKK-IDW08-SO-111522	Total/NA	Solid	EPA 9023	913902_P
410-106221-5	NBKK-IDW09-SO-111522	Total/NA	Solid	EPA 9023	913902_P
410-106221-6	NBKK-IDW10-SO-111522	Total/NA	Solid	EPA 9023	913902_P
3591983	Method Blank	Total/NA	QC-Solid	EPA 9023	913902_P
3591989	Method Blank	Total/NA	QC-Solid	EPA 9023	913902_P
3591991	Method Blank	Total/NA	QC-Solid	EPA 9023	913902_P
3591984	Lab Control Sample	Total/NA	QC-Solid	EPA 9023	913902_P
3591985	Lab Control Sample	Total/NA	QC-Solid	EPA 9023	913902_P

Prep Batch: 913902_P

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-106221-1	NBKK-IDW05-SO-111522	Total/NA	Solid	NA	
410-106221-2	NBKK-IDW06-SO-111522	Total/NA	Solid	NA	
410-106221-3	NBKK-IDW07-SO-111522	Total/NA	Solid	NA	
410-106221-4	NBKK-IDW08-SO-111522	Total/NA	Solid	NA	
410-106221-5	NBKK-IDW09-SO-111522	Total/NA	Solid	NA	
410-106221-6	NBKK-IDW10-SO-111522	Total/NA	Solid	NA	
3591983	Method Blank	Total/NA	QC-Solid	NA	
3591989	Method Blank	Total/NA	QC-Solid	NA	
3591991	Method Blank	Total/NA	QC-Solid	NA	
3591984	Lab Control Sample	Total/NA	QC-Solid	NA	
3591985	Lab Control Sample	Total/NA	QC-Solid	NA	

Lab Chronicle

Client: Jacobs Engineering Group, Inc.
Project/Site: NBK Keyport

Job ID: 410-106221-1

Client Sample ID: NBKK-IDW05-SO-111522
Lab Sample ID: 410-106221-1

Date Collected: 11/15/22 09:40
Matrix: Solid

Date y eceiPed: 11/1A/22 10:05
Rercent Solidv: 75T69

Rrep supe	Batch supe	Batch Method	y Fn	DilFtion . actor	Batch NFmber	z naluvt	Lab	Rrepared or z nalu8ed
Total/NA	Prep	NA		1	913902_P		ALS MTown	11/28/22 18:05
Total/NA	Analysis	EPA 9023		1	913902	PAG	ALS MTown	11/28/22 18:05

Client Sample ID: NBKK-IDW06-SO-111522
Lab Sample ID: 410-106221-2

Date Collected: 11/15/22 10:45
Matrix: Solid

Date y eceiPed: 11/1A/22 10:05
Rercent Solidv: 74T15

Rrep supe	Batch supe	Batch Method	y Fn	DilFtion . actor	Batch NFmber	z naluvt	Lab	Rrepared or z nalu8ed
Total/NA	Prep	NA		1	913902_P		ALS MTown	11/28/22 18:05
Total/NA	Analysis	EPA 9023		1	913902	PAG	ALS MTown	11/28/22 18:05

Client Sample ID: NBKK-IDW0A-SO-111522
Lab Sample ID: 410-106221-3

Date Collected: 11/15/22 11:45
Matrix: Solid

Date y eceiPed: 11/1A/22 10:05
Rercent Solidv: 76T6A

Rrep supe	Batch supe	Batch Method	y Fn	DilFtion . actor	Batch NFmber	z naluvt	Lab	Rrepared or z nalu8ed
Total/NA	Prep	NA		1	913902_P		ALS MTown	11/28/22 18:05
Total/NA	Analysis	EPA 9023		1	913902	PAG	ALS MTown	11/28/22 18:05

Client Sample ID: NBKK-IDW07-SO-111522
Lab Sample ID: 410-106221-4

Date Collected: 11/15/22 13:15
Matrix: Solid

Date y eceiPed: 11/1A/22 10:05
Rercent Solidv: 76

Rrep supe	Batch supe	Batch Method	y Fn	DilFtion . actor	Batch NFmber	z naluvt	Lab	Rrepared or z nalu8ed
Total/NA	Prep	NA		1	913902_P		ALS MTown	11/28/22 18:05
Total/NA	Analysis	EPA 9023		1	913902	PAG	ALS MTown	11/28/22 18:05

Client Sample ID: NBKK-IDW09-SO-111522
Lab Sample ID: 410-106221-5

Date Collected: 11/15/22 14:00
Matrix: Solid

Date y eceiPed: 11/1A/22 10:05
Rercent Solidv: 7AT3

Rrep supe	Batch supe	Batch Method	y Fn	DilFtion . actor	Batch NFmber	z naluvt	Lab	Rrepared or z nalu8ed
Total/NA	Prep	NA		1	913902_P		ALS MTown	11/28/22 18:05
Total/NA	Analysis	EPA 9023		1	913902	PAG	ALS MTown	11/28/22 18:05

Lab Chronicle

Client: Jacobs Engineering Group, Inc.
Project/Site: NBK Keyport

Job ID: 410-106221-1

Client Sample ID: NBKK-IDW10-SO-111522
Date Collected: 11/15/22 14:40
Date y eceiPed: 11/1A/22 10:05

Lab Sample ID: 410-106221-6
Matrix: Solid
Rercent Solidv: A9TA

Rrep supe	Batch supe	Batch Method	y Fn	DilFtion . actor	Batch NFmber	z naluvt	Lab	Rrepared or z nalu8ed
Total/NA	Prep	NA		1	913902_P		ALS MTown	11/28/22 18:05
Total/NA	Analysis	EPA 9023		1	913902	PAG	ALS MTown	11/28/22 18:05

Laboratoru y eferencev:
ALS MTown = ALS Environmental - Middletown, PA, 301 Fulling Mill Road, Middletown, PA 17057

Method Summary

Client: Jacobs Engineering Group, Inc.
Project/Site: NBK Keyport

Job ID: 410-106221-1

Method	Method Description	Protocol	Laboratory
9023	Extractable Organic Halides (EOX) in Solids	SW846	ALS MTown

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

ALS MTown = ALS Environmental - Middletown, PA, 301 Fulling Mill Road, Middletown, PA 17057

Sample Summary

Client: Jacobs Engineering Group, Inc.
Project/Site: NBK Keyport

Job ID: 410-106221-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
410-106221-1	NBKK-IDW05-SO-111522	Solid	11/15/22 09:40	11/17/22 10:05
410-106221-2	NBKK-IDW06-SO-111522	Solid	11/15/22 10:45	11/17/22 10:05
410-106221-3	NBKK-IDW07-SO-111522	Solid	11/15/22 11:45	11/17/22 10:05
410-106221-4	NBKK-IDW08-SO-111522	Solid	11/15/22 13:15	11/17/22 10:05
410-106221-5	NBKK-IDW09-SO-111522	Solid	11/15/22 14:00	11/17/22 10:05
410-106221-6	NBKK-IDW10-SO-111522	Solid	11/15/22 14:40	11/17/22 10:05

301 Fulling Mill Road | Middletown, PA 17057 | Phone: 717-944-5541 | Fax: 717-944-1430 | www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

Analytical Results Report For **Eurofins Lancaster Laboratories Environmental, LLC**

Project 410-106221-1
Workorder 3275239
Report ID 211958 on 12/8/2022

Certificate of Analysis

Enclosed are the analytical results for samples received by the laboratory on Nov 22, 2022.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Sarah Leung (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

ALS Middletown: 301 Fulling Mill Road, Middletown, PA 17057 : 717-944-5541.

Recipient(s):
ENV Subcontracting - Lancaster Laboratories

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Sarah Leung

Sarah Leung *(ALS Digital Signature)*
Project Coordinator

Sample Summary

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collector	Collection Company
3275239001	410-106221-1	Solid	11/15/2022 09:40	11/22/2022 10:00	CBC	Collected By Client
3275239002	410-106221-2	Solid	11/15/2022 10:45	11/22/2022 10:00	CBC	Collected By Client
3275239003	410-106221-3	Solid	11/15/2022 11:45	11/22/2022 10:00	CBC	Collected By Client
3275239004	410-106221-4	Solid	11/15/2022 13:15	11/22/2022 10:00	CBC	Collected By Client
3275239005	410-106221-5	Solid	11/15/2022 14:00	11/22/2022 10:00	CBC	Collected By Client
3275239006	410-106221-6	Solid	11/15/2022 14:40	11/22/2022 10:00	CBC	Collected By Client

Reference

Notes

- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
- Except as qualified, Clean Water Act sample analyses are consistent with methodology requirements in 40 CFR Part 136.
- Except as qualified, Safe Drinking Water Act sample analyses are consistent with methodology requirements in 40 CFR Part 141.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
- Method references listed on this report beginning with the prefix “S” followed by a method number (such as S2310B-97) refer to methods from “Standard Methods for the Examination of Water and Wastewater”.
- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND) above the MDL
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Practical Quantitation Limit for this Project
ND	Not Detected - indicates that the analyte was Not Detected
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits
#	Please reference the result in the Results Section for analyte-level flags.

Project Notations

Sample Notations

Lab ID	Sample ID

Result Notations

Notation Ref.	
1	Analyte was analyzed past the 7 day holding time.
2	The QC sample type DUP for method S2540G-11 was outside the control limits for the analyte Moisture. The RPD was reported as 43 and the upper control limit is 10.
3	The QC sample type DUP for method S2540G-11 was outside the control limits for the analyte Total Solids. The RPD was reported as 9.33 and the upper control limit is 5.

Detected Results Summary

Client Sample ID	410-106221-1	Collected	11/15/2022 09:40
Lab Sample ID	3275239001	Lab Receipt	11/22/2022 10:00

Compound	Result	Units	RDL	Method	Flag
WET CHEMISTRY					
Moisture	14.3	%	0.1	S2540G-11	#
Total Solids	85.7	%	0.1	S2540G-11	#

Detected Results Summary

Client Sample ID	410-106221-2	Collected	11/15/2022 10:45
Lab Sample ID	3275239002	Lab Receipt	11/22/2022 10:00

Compound	Result	Units	RDL	Method	Flag
WET CHEMISTRY					
Moisture	15.8	%	0.1	S2540G-11	#
Total Solids	84.2	%	0.1	S2540G-11	#

Detected Results Summary

Client Sample ID	410-106221-3	Collected	11/15/2022 11:45
Lab Sample ID	3275239003	Lab Receipt	11/22/2022 10:00

Compound	Result	Units	RDL	Method	Flag
WET CHEMISTRY					
Moisture	13.3	%	0.1	S2540G-11	#
Total Solids	86.7	%	0.1	S2540G-11	#

Detected Results Summary

Client Sample ID	410-106221-4	Collected	11/15/2022 13:15
Lab Sample ID	3275239004	Lab Receipt	11/22/2022 10:00

Compound	Result	Units	RDL	Method	Flag
WET CHEMISTRY					
Moisture	14.0	%	0.1	S2540G-11	#
Total Solids	86.0	%	0.1	S2540G-11	#

Detected Results Summary

Client Sample ID	410-106221-5	Collected	11/15/2022 14:00
Lab Sample ID	3275239005	Lab Receipt	11/22/2022 10:00

Compound	Result	Units	RDL	Method	Flag
WET CHEMISTRY					
Moisture	12.7	%	0.1	S2540G-11	#
Total Solids	87.3	%	0.1	S2540G-11	#

Detected Results Summary

Client Sample ID	410-106221-6	Collected	11/15/2022 14:40
Lab Sample ID	3275239006	Lab Receipt	11/22/2022 10:00

Compound	Result	Units	RDL	Method	Flag
WET CHEMISTRY					
Moisture	20.3	%	0.1	S2540G-11	#
Total Solids	79.7	%	0.1	S2540G-11	#

Results

Client Sample ID	410-106221-1	Collected	11/15/2022 09:40
Lab Sample ID	3275239001	Lab Receipt	11/22/2022 10:00

WET CHEMISTRY

Compound	Result	Flag	Units	RDL	Method	Dilution	Analysis Date/Time	By	Cntr
Halogen, Total Organic (TOX)	ND	ND	mg/kg	5.7	SW846 9023	1	11/28/2022 18:05	PAG	A
Moisture	14.3		%	0.1	S2540G-11	1	12/05/2022 14:00	NXL	
Total Solids	85.7	1	%	0.1	S2540G-11	1	12/05/2022 14:00	NXL	

Results

Client Sample ID	410-106221-2	Collected	11/15/2022 10:45
Lab Sample ID	3275239002	Lab Receipt	11/22/2022 10:00

WET CHEMISTRY

Compound	Result	Flag	Units	RDL	Method	Dilution	Analysis Date/Time	By	Cntr
Halogen, Total Organic (TOX)	ND	ND	mg/kg	5.6	SW846 9023	1	11/28/2022 18:05	PAG	A
Moisture	15.8		%	0.1	S2540G-11	1	12/05/2022 14:00	NXL	
Total Solids	84.2	1	%	0.1	S2540G-11	1	12/05/2022 14:00	NXL	

Results

Client Sample ID	410-106221-3	Collected	11/15/2022 11:45
Lab Sample ID	3275239003	Lab Receipt	11/22/2022 10:00

WET CHEMISTRY

Compound	Result	Flag	Units	RDL	Method	Dilution	Analysis Date/Time	By	Cntr
Halogen, Total Organic (TOX)	ND	ND	mg/kg	5.6	SW846 9023	1	11/28/2022 18:05	PAG	A
Moisture	13.3		%	0.1	S2540G-11	1	12/05/2022 14:00	NXL	
Total Solids	86.7	1	%	0.1	S2540G-11	1	12/05/2022 14:00	NXL	

Results

Client Sample ID	410-106221-4	Collected	11/15/2022 13:15
Lab Sample ID	3275239004	Lab Receipt	11/22/2022 10:00

WET CHEMISTRY

Compound	Result	Flag	Units	RDL	Method	Dilution	Analysis Date/Time	By	Cntr
Halogen, Total Organic (TOX)	ND	ND	mg/kg	5.5	SW846 9023	1	11/28/2022 18:05	PAG	A
Moisture	14.0	2	%	0.1	S2540G-11	1	12/05/2022 14:00	NXL	
Total Solids	86.0	1,3	%	0.1	S2540G-11	1	12/05/2022 14:00	NXL	

Results

Client Sample ID	410-106221-5	Collected	11/15/2022 14:00
Lab Sample ID	3275239005	Lab Receipt	11/22/2022 10:00

WET CHEMISTRY

Compound	Result	Flag	Units	RDL	Method	Dilution	Analysis Date/Time	By	Cntr
Halogen, Total Organic (TOX)	ND	ND	mg/kg	5.2	SW846 9023	1	11/28/2022 18:05	PAG	A
Moisture	12.7		%	0.1	S2540G-11	1	12/05/2022 14:00	NXL	
Total Solids	87.3	1	%	0.1	S2540G-11	1	12/05/2022 14:00	NXL	

Results

Client Sample ID	410-106221-6	Collected	11/15/2022 14:40
Lab Sample ID	3275239006	Lab Receipt	11/22/2022 10:00

WET CHEMISTRY

Compound	Result	Flag	Units	RDL	Method	Dilution	Analysis Date/Time	By	Cntr
Halogen, Total Organic (TOX)	ND	ND	mg/kg	5.8	SW846 9023	1	11/28/2022 18:05	PAG	A
Moisture	20.3		%	0.1	S2540G-11	1	12/05/2022 14:00	NXL	
Total Solids	79.7	1	%	0.1	S2540G-11	1	12/05/2022 14:00	NXL	

Sample - Method Cross Reference Table

Lab ID	Sample ID	Analysis Method	Preparation Method	Leachate Method
3275239001	410-106221-1	S2540G-11	N/A	
		SW846 9023	N/A	
3275239002	410-106221-2	S2540G-11	N/A	
		SW846 9023	N/A	
3275239003	410-106221-3	S2540G-11	N/A	
		SW846 9023	N/A	
3275239004	410-106221-4	S2540G-11	N/A	
		SW846 9023	N/A	
3275239005	410-106221-5	S2540G-11	N/A	
		SW846 9023	N/A	
3275239006	410-106221-6	S2540G-11	N/A	
		SW846 9023	N/A	

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Lab ID	Sample ID	Preparation Method	Prep Batch	Prep Date/Time	By	Analysis Method	Anly Batch
3275239001	410-106221-1	N/A	N/A	N/A		S2540G-11	915284
		N/A	N/A	N/A		SW846 9023	913902
3275239002	410-106221-2	N/A	N/A	N/A		S2540G-11	915284
		N/A	N/A	N/A		SW846 9023	913902
3275239003	410-106221-3	N/A	N/A	N/A		S2540G-11	915284
		N/A	N/A	N/A		SW846 9023	913902
3275239004	410-106221-4	N/A	N/A	N/A		S2540G-11	915284
		N/A	N/A	N/A		SW846 9023	913902
3275239005	410-106221-5	N/A	N/A	N/A		S2540G-11	915284
		N/A	N/A	N/A		SW846 9023	913902
3275239006	410-106221-6	N/A	N/A	N/A		S2540G-11	915284
		N/A	N/A	N/A		SW846 9023	913902

Eurofins Lancaster Laboratories Environme
2425 New Holland Pike
Lancaster, PA 17601
Phone: 717-656-2300 Fax: 717-656-2681

Chain of Custody Record

3275239
Logged By: CXW
PM: SSL

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Client Information (Sub Contract Lab)	Sampler:	Lab PM: Martin, Elizabeth	COC No: 410-1799282.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Elizabeth.Martin@et.eurofinsus.com	State of Origin: Washington	Page: Page 1 of 1
Company: ALS Environmental		Accreditations Required (See note): Dept. of Defense ELAP - A2LA; State - Washington	Job #: 410-106221-1
Address: 301 Fulling Mill Road, ,	Due Date Requested: 12/2/2022		
City: Middletown	TAT Requested (days):		
State, Zip: PA, 17057			
Phone:	PO #:		
Email:	WO #:		
Project Name: NBK Keyport	Project #: 41012633		
Site:	SSOW#:		

Analysis Requested

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	SUB (Total Organic Halogens - 12-day TAT)/ EPA 9023	Total Containers
			Preservation Code:					
NBKK-IDW05-SO-111522 (410-106221-1)	11/15/22	09:40 Pacific		Solid			X	
NBKK-IDW06-SO-111522 (410-106221-2)	11/15/22	10:45 Pacific		Solid			X	
NBKK-IDW07-SO-111522 (410-106221-3)	11/15/22	11:45 Pacific		Solid			X	
NBKK-IDW08-SO-111522 (410-106221-4)	11/15/22	13:15 Pacific		Solid			X	
NBKK-IDW09-SO-111522 (410-106221-5)	11/15/22	14:00 Pacific		Solid			X	
NBKK-IDW10-SO-111522 (410-106221-6)	11/15/22	14:40 Pacific		Solid			X	

MJE 11/22/22

Temp Taken By: MJE
WO Temp (°C) 4°C
Therm ID: TH50
Receipt Info Completed By: MJE
Cooler Custody Seal Intact Y N (NA)
Sample Custody Seal Intact Y N (NA)
Received on Ice (Y) N NA
Cooler & Samples Intact (Y) N
Correct Containers Provided (Y) N
Sample Label/COC Agree (Y) N
Adequate Sample Volumes (Y) N
VOA Headspace Present Y N (NA)
Voa Trip Blank Y N (NA)
NJ≤ 4 Days? Y (N)
Rad Screen (uCi)
Courier/Tracking #:

SDWA Compliance Y (N)
PWSID
WV Containers 0-6°C Y N (NA)

Special Instructions/Note:

See Attached Instructions
See Attached Instructions
See Attached Instructions
See Attached Instructions
See Attached Instructions
See Attached Instructions

*NoSampler, G/C-MJE 11/22/22

Preservation Codes:

A - HCL
B - NaOH
C - Zn Acetate
D - Nitric Acid
E - NaHSO4
F - MeOH
G - Amchlor
H - Ascorbic Acid
I - Ice
J - DI Water
K - EDTA
L - EDA
M - Hexane
N - None
O - AsNaO2
P - Na2O4S
Q - Na2SO3
R - Na2S2O3
S - H2SO4
T - TSP Dodecahydrate
U - Acetone
V - MCAA
W - pH 4-5
Y - Trizma
Z - other (specify)
Other:

Note: Since laboratory accreditations are subject to change, Eurofins Lancaster Laboratories Environment Testing, LLC places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Lancaster Laboratories Environment Testing, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Lancaster Laboratories Environment Testing, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins Lancaster Laboratories Environment Testing, LLC.

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:
Relinquished by: A Bauer	Date/Time: 11-21-22 1423	Company: Elle	Received by: Brooke Collins
Relinquished by:	Date/Time:	Company	Received by:
Relinquished by:	Date/Time:	Company	Received by:

Date/Time: 11-22-22 1000 Company: ALS
Date/Time: Company
Date/Time: Company

Custody Seals Intact: Δ Yes Δ No
Custody Seal No.:
Cooler Temperature(s) °C and Other Remarks:

410-106221 Chain of Custody

:nvironme

Chain of Custody Record

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	Sampler: Ilka Dinkelman	Lab PM: Martin, Elizabeth	Carrier Tracking No(s):	COC No: 410-67560-19592.1
Client Contact: Kim Shiroodi	Phone: 775-336-9176	E-Mail: Elizabeth.Martin@et.eurofinsus.com	State of Origin: WA	Page: Page 1 of 1
Company: Jacobs Engineering Group, Inc.	PWSID:	Analysis Requested		Job #:
Address: 8735 W Higgins Road Suite 400	Due Date Requested:			Preservation Codes: A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)
City: Chicago	TAT Requested (days): Standard (28 Days)			
State, Zip: IL, 60631	Compliance Project: Δ Yes Δ No			
Phone: 352-384-7002(Tel)	PO #: Purchase Order Requested			
Email: Kim.Shiroodi@jacobs.com	WO #:			
Project Name: NBK Keyport	Project #: 41012633			
Site:	SSOW#:			Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	SUBCONTRACT - EPA 9023 - TOX (SO)	Total Number of containers	Special Instructions/Note:
			Preservation Code:		X	X	N	X	
NBKK-1DW05-SO-111522	11/15/22	9:40	C	S			1	1	
NBKK-1DW06-SO-111522	11/15/22	10:45	C	S			1	1	
NBKK-1DW07-SO-111522	11/15/22	11:45	C	S			1	1	
NBKK-1DW08-SO-111522	11/15/22	13:15	C	S			1	1	
NBKK-1DW09-SO-111522	11/15/22	14:00	C	S			1	1	
NBKK-1DW09-SO-111522	11/15/22	14:40	C	S			1	1	

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by: | Date: | Time: | Method of Shipment:

	Date/Time	Company	Received by	Date/Time	Company
Relinquished by: Ilka D. Dinkelman	11/15/22 15:15	Jacobs	Nathan Lee Martin	11/15/22 1550	Jacobs
Relinquished by: Nathan Lee Martin	11/16/22 1200	Jacobs	Received by: FedEx	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 11/17/22 1005	Company

Custody Seals Intact: ☒ Yes Δ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: 1.4

K E

Ver: 06/08/2021

12/9/2022

Login Sample Receipt Checklist

Client: Jacobs Engineering Group, Inc. Job Number: 410-106221-1

Login Number: 106221 **List Source: Eurofins Lancaster Laboratories Environment Testing, LLC**
List Number: 1
Creator: Foreman, Kai

Question	Answer	Comment
The cooler's custody seal is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable (</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	False	Refer to Job Narrative for details.
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	True	
Sample custody seals are intact.	N/A	
VOA sample vials do not have headspace >6mm in diameter (none, if from WV)?	N/A	

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ANALYTICAL REPORT

PREPARED FOR

Attn: Juan Acaron
Jacobs Engineering Group, Inc.
3011 SW Willston Road
Gainesville, Florida 32608-3964

Generated 2/24/2023 7:24:44 PM

JOB DESCRIPTION

CTO-4117 NBK Keyport
SDG NUMBER NBK Keyport

JOB NUMBER

410-113811-1

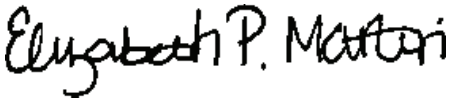
Eurofins Lancaster Laboratories Environment Testing, LLC
2425 New Holland Pike
Lancaster PA 17601

See page two for job notes and contact information.

Job Notes

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Authorization



Generated
2/24/2023 7:24:44 PM

Authorized for release by
Elizabeth Martin, Project Manager
Elizabeth.Martin@et.eurofinsus.com
(717)205-3949

Compliance Statement

Analytical test results meet all requirements of the associated regulatory program (e.g., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis. Data qualifiers are applied to note exceptions. Noncompliant quality control (QC) is further explained in narrative comments.
· QC results that exceed the upper limits and are associated with non-detect samples are qualified but further narration is not required since the bias is high and does not change a non-detect result. Further narration is also not required with QC blank detection when the associated sample concentration is non-detect or more than ten times the level in the blank.
· Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD is performed, unless otherwise specified in the method.
· Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.
Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Measurement uncertainty values, as applicable, are available upon request.

Test results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" and tested in the laboratory are not performed within 15 minutes of collection.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. The foregoing express warranty is exclusive and is given in lieu of all other warranties, expressed or implied, except as otherwise agreed. We disclaim any other warranties, expressed or implied, including a warranty of fitness for particular purpose and warranty of merchantability. In no event shall Eurofins Lancaster Laboratories Environmental, LLC be liable for indirect, special, consequential, or incidental damages including, but not limited to, damages for loss of profit or goodwill regardless of (A) the negligence (either sole or concurrent) of Eurofins Lancaster Laboratories Environmental and (B) whether Eurofins Lancaster Laboratories Environmental has been informed of the possibility of such damages. We accept no legal responsibility for the purposes for which the client uses the test results. Except as otherwise agreed, no purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

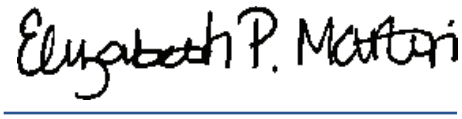


Table of Contents

Definitions/Glossary

Client: Jacobs Engineering Group, Inc.
Project/Site: CTO-4117 NBK Keyport

Job ID: 410-113811-1
SDG: NBK Keyport

Qualifiers

GC/MS SeV i OAc

Qualifier	Qualifier Desprintion
cn	Refer to Case Narrative for further detail
H	Sample was prepped or analyzed beyond the specified holding time
J	Estimated: The analyte was positively identified; the quantitation is an estimation
M	Manual integrated compound.
Q	One or more quality control criteria failed.
U	Undetected at the Limit of Detection.

GC OAc

Qualifier	Qualifier Desprintion
M	Manual integrated compound.
U	Undetected at the Limit of Detection.

GC SeV i OAc

Qualifier	Qualifier Desprintion
cn	Refer to Case Narrative for further detail
J	Estimated: The analyte was positively identified; the quantitation is an estimation
M	Manual integrated compound.
Q	One or more quality control criteria failed.
U	Undetected at the Limit of Detection.

Metals

Qualifier	Qualifier Desprintion
B	Blank contamination: The analyte was detected above one-half the reporting limit in an associated blank.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
U	Undetected at the Limit of Detection.

General CheV istry

Qualifier	Qualifier Desprintion
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
U	Undetected at the Limit of Detection.

Glossary

c bbreviation	These poV V only used abbreviations V ay or V ay not be rresent in this rerort.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)

Glossary (Continued)

c bbreviation	These poV V only used abbreviations V ay or V ay not be rresent in this rerort.
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 410-113811-1

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC

Narrative

Job Narrative
410-113811-1

Receipt
The samples were received on 1/27/2023 9:40 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 5 coolers at receipt time were 1.1°C, 1.2°C, 1.3°C, 2.7°C and 3.8°C.

GC/MS Semi VOA
Method 8270E_SIM_DOD5: Surrogate recovery for the following sample was outside control limits: NBKK-IDW16-AQ-012523 (410-113811-6). Re-extraction and/or re-analysis was performed outside of holding time with acceptable results.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

GC VOA
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

GC Semi VOA
Method NWTPH_Dx: Surrogate recovery for the following sample was outside control limits: NBKK-IDW16-AQ-012523 (410-113811-6). Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

PCBs
Method 8082A_DOD5: The tetrachloro-m-xylene surrogate recovery for the Blank and Laboratory Control Sample Duplicate (LCSD) associated with preparation batch 410-342006 and analytical batch 410-342238 was outside the lower control limits. The associated sample was non detect.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Metals
Method 6020B_DOD5: Due to the matrix, the initial volume(s) used for the following sample deviated from the standard procedure: NBKK-IDW16-AQ-012523 (410-113811-6). The reporting limits (RLs) have been adjusted proportionately.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Detection Summary

Client: Jacobs Engineering Group, Inc.
Project/Site: CTO-4117 NBK Keyport

Job ID: 410-113811-1
SDG: NBK Keyport

Client Sample ID: NBKK-IDW11-AQ-012523 — Lab Sample ID: 410-113811-1

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
C12-C24	74	J M	100	93	47	ug/L	1		NWTPH-Dx	Total/NA
Barium	0.022		0.0020	0.0016	0.00075	mg/L	1		6020B	Total Recoverable
Chromium	0.0029		0.0020	0.00080	0.00033	mg/L	1		6020B	Total Recoverable
Copper	0.0046		0.0010	0.00090	0.00036	mg/L	1		6020B	Total Recoverable
Lead	0.0012		0.00050	0.00020	0.000071	mg/L	1		6020B	Total Recoverable
Nickel	0.0047		0.0015	0.00080	0.00040	mg/L	1		6020B	Total Recoverable
Zinc	0.031		0.015	0.0080	0.0040	mg/L	1		6020B	Total Recoverable
Flashpoint	>200		50.0	50.0	50.0	Degrees F	1		1010	Total/NA
pH	7.5	HF	0.01	0.01	0.01	S.U.	1		9040C	Total/NA
Corrosivity	No	HF	0.01	0.01	0.01	NONE	1		9040C	Total/NA

Client Sample ID: NBKK-IDW12-AQ-012523 — Lab Sample ID: 410-113811-2

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.0024		0.0020	0.0016	0.00075	mg/L	1		6020B	Total Recoverable
Copper	0.00055	J	0.0010	0.00090	0.00036	mg/L	1		6020B	Total Recoverable
Zinc	0.10		0.015	0.0080	0.0040	mg/L	1		6020B	Total Recoverable
Mercury	0.083	J	0.20	0.16	0.079	ug/L	1		7470A	Total/NA
Flashpoint	>200		50.0	50.0	50.0	Degrees F	1		1010	Total/NA
pH	7.7	HF	0.01	0.01	0.01	S.U.	1		9040C	Total/NA
Corrosivity	No	HF	0.01	0.01	0.01	NONE	1		9040C	Total/NA

Client Sample ID: NBKK-IDW13-AQ-012523 — Lab Sample ID: 410-113811-3

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.0035		0.0020	0.0017	0.00068	mg/L	1		6020B	Total Recoverable
Barium	0.011		0.0020	0.0016	0.00075	mg/L	1		6020B	Total Recoverable
Copper	0.0024		0.0010	0.00090	0.00036	mg/L	1		6020B	Total Recoverable
Lead	0.00015	J	0.00050	0.00020	0.000071	mg/L	1		6020B	Total Recoverable
Nickel	0.0015		0.0015	0.00080	0.00040	mg/L	1		6020B	Total Recoverable
Flashpoint	>200		50.0	50.0	50.0	Degrees F	1		1010	Total/NA
pH	7.6	HF	0.01	0.01	0.01	S.U.	1		9040C	Total/NA
Corrosivity	No	HF	0.01	0.01	0.01	NONE	1		9040C	Total/NA

Client Sample ID: NBKK-IDW14-AQ-012523 — Lab Sample ID: 410-113811-4

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.0047		0.0020	0.0017	0.00068	mg/L	1		6020B	Total Recoverable
Barium	0.037		0.0020	0.0016	0.00075	mg/L	1		6020B	Total Recoverable
Copper	0.0013		0.0010	0.00090	0.00036	mg/L	1		6020B	Total Recoverable

This Detection Summary does not include radiochemical test results.

Client Sample ID: NBKK-IDW14-AQ-012523 (Continued) — Lab Sample ID: 410-113811-4

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Lead	0.00012	J	0.00050	0.00020	0.000071	mg/L	1		6020B	Total Recoverable
Nickel	0.0024		0.0015	0.00080	0.00040	mg/L	1		6020B	Total Recoverable
Flashpoint	>200		50.0	50.0	50.0	Degrees F	1		1010	Total/NA
pH	8.1	HF	0.01	0.01	0.01	S.U.	1		9040C	Total/NA
Corrosivity	No	HF	0.01	0.01	0.01	NONE	1		9040C	Total/NA

Client Sample ID: NBKK-IDW15-AQ-012523 — Lab Sample ID: 410-113811-5

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.0043		0.0020	0.0017	0.00068	mg/L	1		6020B	Total Recoverable
Barium	0.023		0.0020	0.0016	0.00075	mg/L	1		6020B	Total Recoverable
Copper	0.00091	J	0.0010	0.00090	0.00036	mg/L	1		6020B	Total Recoverable
Nickel	0.0021		0.0015	0.00080	0.00040	mg/L	1		6020B	Total Recoverable
Zinc	0.0058	J	0.015	0.0080	0.0040	mg/L	1		6020B	Total Recoverable
Flashpoint	>200		50.0	50.0	50.0	Degrees F	1		1010	Total/NA
pH	8.0	HF	0.01	0.01	0.01	S.U.	1		9040C	Total/NA
Corrosivity	No	HF	0.01	0.01	0.01	NONE	1		9040C	Total/NA

Client Sample ID: NBKK-IDW16-AQ-012523 — Lab Sample ID: 410-113811-6

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
1-Methylnaphthalene	5.1	cn	0.053	0.042	0.021	ug/L	1		8270E SIM	Total/NA
2-Methylnaphthalene	4.0	cn	0.053	0.042	0.021	ug/L	1		8270E SIM	Total/NA
Benzo[g,h,i]perylene	0.11	M cn	0.053	0.032	0.011	ug/L	1		8270E SIM	Total/NA
Fluoranthene	0.15	M cn	0.053	0.032	0.011	ug/L	1		8270E SIM	Total/NA
Fluorene	0.39	M cn	0.053	0.032	0.011	ug/L	1		8270E SIM	Total/NA
Indeno[1,2,3-cd]pyrene	0.044	J M cn	0.053	0.042	0.021	ug/L	1		8270E SIM	Total/NA
Naphthalene	1.1	M cn	0.074	0.063	0.032	ug/L	1		8270E SIM	Total/NA
Phenanthrene	0.74	M cn	0.074	0.063	0.032	ug/L	1		8270E SIM	Total/NA
Pyrene	0.38	M cn	0.053	0.032	0.011	ug/L	1		8270E SIM	Total/NA
Benzo[g,h,i]perylene - RE	0.030	J H	0.057	0.034	0.011	ug/L	1		8270E SIM	Total/NA
Pyrene - RE	0.071	H M	0.057	0.034	0.011	ug/L	1		8270E SIM	Total/NA
C7-C12 (1C)	330	M	250	85	43	ug/L	1		NWTPH-Gx	Total/NA
C12-C24	4900	M cn	100	92	46	ug/L	1		NWTPH-Dx	Total/NA
C24-C40	6900	M cn	260	250	100	ug/L	1		NWTPH-Dx	Total/NA
Arsenic	0.045		0.010	0.0085	0.0034	mg/L	1		6020B	Total Recoverable
Barium	1.1	B	0.010	0.0080	0.0037	mg/L	1		6020B	Total Recoverable
Cadmium	0.0033		0.0025	0.0020	0.00076	mg/L	1		6020B	Total Recoverable
Chromium	0.33		0.010	0.0040	0.0017	mg/L	1		6020B	Total Recoverable
Copper	0.30		0.0050	0.0045	0.0018	mg/L	1		6020B	Total Recoverable
Lead	0.12		0.0025	0.0010	0.00036	mg/L	1		6020B	Total Recoverable

This Detection Summary does not include radiochemical test results.

Client Sample ID: NBKK-IDW16-AQ-012523 (Continued) — Lab Sample ID: 410-113811-6

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Nickel	0.40		0.0075	0.0040	0.0020	mg/L	1		6020B	Total Recoverable
Selenium	0.0020	J	0.0050	0.0030	0.0014	mg/L	1		6020B	Total Recoverable
Silver	0.0011	J	0.0025	0.0015	0.00050	mg/L	1		6020B	Total Recoverable
Zinc	0.53		0.075	0.040	0.020	mg/L	1		6020B	Total Recoverable
Mercury	0.58	J	1.0	0.80	0.40	ug/L	1		7470A	Total/NA
Flashpoint	>201		50.0	50.0	50.0	Degrees F	1		1010	Total/NA
pH	7.5	HF	0.01	0.01	0.01	S.U.	1		9040C	Total/NA
Corrosivity	No	HF	0.01	0.01	0.01	NONE	1		9040C	Total/NA

Client Sample ID: NBKK-IDW17-AQ-012523 — Lab Sample ID: 410-113811-7

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.0025		0.0020	0.0017	0.00068	mg/L	1		6020B	Total Recoverable
Barium	0.019		0.0020	0.0016	0.00075	mg/L	1		6020B	Total Recoverable
Chromium	0.0013	J	0.0020	0.00080	0.00033	mg/L	1		6020B	Total Recoverable
Copper	0.0027		0.0010	0.00090	0.00036	mg/L	1		6020B	Total Recoverable
Lead	0.00078		0.00050	0.00020	0.000071	mg/L	1		6020B	Total Recoverable
Nickel	0.0032		0.0015	0.00080	0.00040	mg/L	1		6020B	Total Recoverable
Zinc	0.0094	J	0.015	0.0080	0.0040	mg/L	1		6020B	Total Recoverable
Flashpoint	>200		50.0	50.0	50.0	Degrees F	1		1010	Total/NA
pH	7.8	HF	0.01	0.01	0.01	S.U.	1		9040C	Total/NA
Corrosivity	No	HF	0.01	0.01	0.01	NONE	1		9040C	Total/NA

Client Sample ID: NBKK-IDW18-AQ-012523 — Lab Sample ID: 410-113811-8

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
C12-C24	51	J M	110	95	48	ug/L	1		NWTPH-Dx	Total/NA
Arsenic	0.0041		0.0020	0.0017	0.00068	mg/L	1		6020B	Total Recoverable
Barium	0.042		0.0020	0.0016	0.00075	mg/L	1		6020B	Total Recoverable
Chromium	0.0090		0.0020	0.00080	0.00033	mg/L	1		6020B	Total Recoverable
Copper	0.0096		0.0010	0.00090	0.00036	mg/L	1		6020B	Total Recoverable
Lead	0.0011		0.00050	0.00020	0.000071	mg/L	1		6020B	Total Recoverable
Nickel	0.014		0.0015	0.00080	0.00040	mg/L	1		6020B	Total Recoverable
Zinc	0.026		0.015	0.0080	0.0040	mg/L	1		6020B	Total Recoverable
Flashpoint	>201		50.0	50.0	50.0	Degrees F	1		1010	Total/NA
pH	8.0	HF	0.01	0.01	0.01	S.U.	1		9040C	Total/NA
Corrosivity	No	HF	0.01	0.01	0.01	NONE	1		9040C	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Jacobs Engineering Group, Inc.
Project/Site: CTO-4117 NBK Keyport

Job ID: 410-113811-1
SDG: NBK Keyport

Client Sample ID: NBKK-IDW19-AQ-012523 — Lab Sample ID: 410-113811-9

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
C12-C24	130	M	110	100	50	ug/L	1		NWTPH-Dx	Total/NA
Barium	0.026		0.0020	0.0016	0.00075	mg/L	1		6020B	Total Recoverable
Chromium	0.0019	J	0.0020	0.00080	0.00033	mg/L	1		6020B	Total Recoverable
Copper	0.0027		0.0010	0.00090	0.00036	mg/L	1		6020B	Total Recoverable
Lead	0.00042	J	0.00050	0.00020	0.000071	mg/L	1		6020B	Total Recoverable
Nickel	0.0065		0.0015	0.00080	0.00040	mg/L	1		6020B	Total Recoverable
Zinc	0.0082	J	0.015	0.0080	0.0040	mg/L	1		6020B	Total Recoverable
Flashpoint	>200		50.0	50.0	50.0	Degrees F	1		1010	Total/NA
pH	7.2	HF	0.01	0.01	0.01	S.U.	1		9040C	Total/NA
Corrosivity	No	HF	0.01	0.01	0.01	NONE	1		9040C	Total/NA

Client Sample ID: NBKK-IDW20-AQ-012523 — Lab Sample ID: 410-113811-10

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.0092		0.0020	0.0017	0.00068	mg/L	1		6020B	Total Recoverable
Barium	0.18	B	0.0020	0.0016	0.00075	mg/L	1		6020B	Total Recoverable
Cadmium	0.00075		0.00050	0.00040	0.00015	mg/L	1		6020B	Total Recoverable
Chromium	0.040		0.0020	0.00080	0.00033	mg/L	1		6020B	Total Recoverable
Copper	0.041		0.0010	0.00090	0.00036	mg/L	1		6020B	Total Recoverable
Lead	0.014		0.00050	0.00020	0.000071	mg/L	1		6020B	Total Recoverable
Nickel	0.042		0.0015	0.00080	0.00040	mg/L	1		6020B	Total Recoverable
Selenium	0.00067	J	0.0010	0.00060	0.00028	mg/L	1		6020B	Total Recoverable
Zinc	0.090		0.015	0.0080	0.0040	mg/L	1		6020B	Total Recoverable
Flashpoint	>201		50.0	50.0	50.0	Degrees F	1		1010	Total/NA
pH	7.5	HF	0.01	0.01	0.01	S.U.	1		9040C	Total/NA
Corrosivity	No	HF	0.01	0.01	0.01	NONE	1		9040C	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: Jacobs Engineering Group, Inc.
Project/Site: CTO-4117 NBK Keyport

Job ID: 410-113811-1
SDG: NBK Keyport

Client Sample ID: NBKK-IDW11-5O-01M M6
Date Cclle/ te9: 01RM RM6 16:00
Date Re/ ei8e9: 01RM7RM6 0. :40

Lab Sample ID: 410-116211-1
x atcid: Wateo

x etvc9: SW24h 2M70V SIx - Semi8clatile g o(ani/ Ccmpcun9s G CRx S SIx T

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
1-Methylnaphthalene	0.041	U	0.051	0.041	0.021	ug/L		02/02/23 14:19	1
2-Methylnaphthalene	0.041	U	0.051	0.041	0.021	ug/L		02/02/23 14:19	1
Acenaphthene	0.031	U M	0.051	0.031	0.010	ug/L		02/02/23 14:19	1
Acenaphthylene	0.031	U	0.051	0.031	0.010	ug/L		02/02/23 14:19	1
Anthracene	0.031	U	0.051	0.031	0.010	ug/L		02/02/23 14:19	1
Benzo[a]anthracene	0.031	U	0.051	0.031	0.010	ug/L		02/02/23 14:19	1
Benzo[a]pyrene	0.031	U	0.051	0.031	0.010	ug/L		02/02/23 14:19	1
Benzo[b]fluoranthene	0.031	U	0.051	0.031	0.010	ug/L		02/02/23 14:19	1
Benzo[g,h,i]perylene	0.031	U	0.051	0.031	0.010	ug/L		02/02/23 14:19	1
Benzo[k]fluoranthene	0.031	U	0.051	0.031	0.010	ug/L		02/02/23 14:19	1
Chrysene	0.031	U	0.051	0.031	0.010	ug/L		02/02/23 14:19	1
Dibenz(a,h)anthracene	0.041	U	0.051	0.041	0.021	ug/L		02/02/23 14:19	1
Fluoranthene	0.031	U	0.051	0.031	0.010	ug/L		02/02/23 14:19	1
Fluorene	0.031	U	0.051	0.031	0.010	ug/L		02/02/23 14:19	1
Indeno[1,2,3-cd]pyrene	0.041	U	0.051	0.041	0.021	ug/L		02/02/23 14:19	1
Naphthalene	0.062	U	0.072	0.062	0.031	ug/L		02/02/23 14:19	1
Phenanthrene	0.062	U	0.072	0.062	0.031	ug/L		02/02/23 14:19	1
Pyrene	0.031	U	0.051	0.031	0.010	ug/L		02/02/23 14:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Benzo(a)pyrene-d12 (Surr)	*73*		*10 - 110*	*02/01/23 15:24*	*02/02/23 14:19*	*1*
Fluoranthene-d10 (Surr)	*97*		*47 - 128*	*02/01/23 15:24*	*02/02/23 14:19*	*1*
1-Methylnaphthalene-d10 (Surr)	*88*		*36 - 111*	*02/01/23 15:24*	*02/02/23 14:19*	*1*

x etvc9: NWUf E-) d - NcctvHest - wclatile f etccleum f cc9u/ ts G CT

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
C7-C12 (1C)	85	U M	250	85	43	ug/L		02/01/23 19:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*99*		*50 - 150*		*02/01/23 19:06*	*1*

x etvc9: SW24h 202M5 - f cIQ vIccinate9 BipvenQs G CBsTbQ) as Cvccmatc(capvQ

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
PCB-1016 (1C)	0.21	U M cn	0.26	0.21	0.10	ug/L		02/07/23 11:24	1
PCB-1221 (1C)	0.21	U cn	0.26	0.21	0.10	ug/L		02/07/23 11:24	1
PCB-1232 (1C)	0.21	U M cn	0.26	0.21	0.10	ug/L		02/07/23 11:24	1
PCB-1242 (1C)	0.21	U M cn	0.26	0.21	0.10	ug/L		02/07/23 11:24	1
PCB-1248 (1C)	0.21	U cn	0.26	0.21	0.10	ug/L		02/07/23 11:24	1
PCB-1254 (1C)	0.21	U cn	0.26	0.21	0.080	ug/L		02/07/23 11:24	1
PCB-1260 (1C)	0.21	U Q cn	0.26	0.21	0.080	ug/L		02/07/23 11:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl (Surr) (1C)	*39*	*cn*	*10 - 148*	*02/06/23 15:35*	*02/07/23 11:24*	*1*
DCB Decachlorobiphenyl (Surr) (2C)	*45*	*cn*	*10 - 148*	*02/06/23 15:35*	*02/07/23 11:24*	*1*
Tetrachloro-m-xylene (1C)	*51*	*cn*	*33 - 137*	*02/06/23 15:35*	*02/07/23 11:24*	*1*
Tetrachloro-m-xylene (2C)	*56*	*cn*	*33 - 137*	*02/06/23 15:35*	*02/07/23 11:24*	*1*

x etvc9: NWUf E-Dd - NcctvHest - Semi-wclatile f etccleum f cc9u/ ts G CT

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
C1M-CM4	**74**	**3 x**	100	93	47	ug/L		02/09/23 05:52	1
C24-C40	250	U M	260	250	100	ug/L		02/09/23 05:52	1

Client Sample ID: NBKK-IDW11-5 O-01M r M6
Date Ccll e/ te9: 01 RM r RM6 16:00
Date Re/ ei8e9: 01 RM7 RM6 0. :40

Lab Sample ID: 410-116211-1
x atcid: Wateo

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o- terphenyl (Surr)	87		50 - 150	02/08/23 15:38	02/09/23 05:52	1

x etvc9: SW24h h0M0B - x etals GCf Rx ST- Uctal Re/ c8ecable

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
Arsenic	0.0017	U	0.0020	0.0017	0.00068	mg/L		02/03/23 10:28	1
Badium	0J0MM		0.0020	0.0016	0.00075	mg/L		02/07/23 20:29	1
Cadmium	0.00040	U	0.00050	0.00040	0.00015	mg/L		02/03/23 10:28	1
Cvocmium	0J00M		0.0020	0.00080	0.00033	mg/L		02/03/23 10:28	1
Ccppeo	0J004h		0.0010	0.00090	0.00036	mg/L		02/03/23 10:28	1
Lea9	0J001M		0.00050	0.00020	0.000071	mg/L		02/03/23 10:28	1
Ni/ kel	0J0047		0.0015	0.00080	0.00040	mg/L		02/03/23 10:28	1
Selenium	0.00060	U	0.0010	0.00060	0.00028	mg/L		02/03/23 10:28	1
Silver	0.00030	U	0.00050	0.00030	0.00010	mg/L		02/03/23 10:28	1
Zin/	0J061		0.015	0.0080	0.0040	mg/L		02/03/23 10:28	1

x etvc9: SW24h 74705 - x ed/ ucQ GCw5 5 T

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
Mercury	0.16	U	0.20	0.16	0.079	ug/L		02/03/23 15:54	1

) eneoal CvemistoQ

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
Alasvpcint GSW24h 1010T	>M00		50.0	50.0	50.0	Degrees F		02/08/23 14:00	1
Cyanide, Reactive (SW846 9012)	49	U	59	49	20	mg/Kg		02/09/23 10:17	1
Sulfide, Reactive (SW846 9034)	140	U	160	140	53	mg/Kg		02/08/23 11:57	1
pE GSW24h . 040CT	7Jr	EA	0.01	0.01	0.01	S.U.		01/31/23 17:30	1
Ccoocsi8itQGSW24h . 040CT	Nc	EA	0.01	0.01	0.01	NONE		01/31/23 17:30	1

Client Sample ID: NBKK-IDW1M-5 O-01M r M6
Date Ccll e/ te9: 01 RM r RM6 16:1r
Date Re/ ei8e9: 01 RM7 RM6 0. :40

Lab Sample ID: 410-116211-M
x atcid: Wateo

x etvc9: SW24h 2M70V Slx - Semi8clatile g o(ani/ Ccmpcun9s G CPx S Slx T

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
1-Methylnaphthalene	0.041	U	0.052	0.041	0.021	ug/L		02/02/23 14:40	1
2-Methylnaphthalene	0.041	U	0.052	0.041	0.021	ug/L		02/02/23 14:40	1
Acenaphthene	0.031	U	0.052	0.031	0.010	ug/L		02/02/23 14:40	1
Acenaphthylene	0.031	U	0.052	0.031	0.010	ug/L		02/02/23 14:40	1
Anthracene	0.031	U	0.052	0.031	0.010	ug/L		02/02/23 14:40	1
Benzo[a]anthracene	0.031	U	0.052	0.031	0.010	ug/L		02/02/23 14:40	1
Benzo[a]pyrene	0.031	U	0.052	0.031	0.010	ug/L		02/02/23 14:40	1
Benzo[b]fluoranthene	0.031	U	0.052	0.031	0.010	ug/L		02/02/23 14:40	1
Benzo[g,h,i]perylene	0.031	U	0.052	0.031	0.010	ug/L		02/02/23 14:40	1
Benzo[k]fluoranthene	0.031	U	0.052	0.031	0.010	ug/L		02/02/23 14:40	1
Chrysene	0.031	U	0.052	0.031	0.010	ug/L		02/02/23 14:40	1
Dibenz(a,h)anthracene	0.041	U	0.052	0.041	0.021	ug/L		02/02/23 14:40	1
Fluoranthene	0.031	U	0.052	0.031	0.010	ug/L		02/02/23 14:40	1
Fluorene	0.031	U	0.052	0.031	0.010	ug/L		02/02/23 14:40	1
Indeno[1,2,3-cd]pyrene	0.041	U	0.052	0.041	0.021	ug/L		02/02/23 14:40	1
Naphthalene	0.062	U	0.072	0.062	0.031	ug/L		02/02/23 14:40	1
Phenanthrene	0.062	U	0.072	0.062	0.031	ug/L		02/02/23 14:40	1
Pyrene	0.031	U	0.052	0.031	0.010	ug/L		02/02/23 14:40	1

Client Sample ID: NBKK-IDW1M-5 O-01M r M6
Date Ccile/ te9: 01 M r M6 16:1r
Date Re/ ei8e9: 01 M7 M6 0. :40

Lab Sample ID: 410-116211-M
x atcid: Wateo

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Benzo(a)pyrene-d12 (Surr)	53		10 - 110	02/01/23 15:24	02/02/23 14:40	1
Fluoranthene-d10 (Surr)	94		47 - 128	02/01/23 15:24	02/02/23 14:40	1
1-Methylnaphthalene-d10 (Surr)	90		36 - 111	02/01/23 15:24	02/02/23 14:40	1

x etvc9: NWUf E-) d - NcctvHest - wclatile f etocleum f oc9u/ ts G CT

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
C7-C12 (1C)	85	U M	250	85	43	ug/L		02/01/23 19:32	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
a,a,a-Trifluorotoluene (fid) (1C)	99		50 - 150		02/01/23 19:32	1

x etvc9: SW24h 202M5 - f clQ/ vlccinate9 BipvenQls G CBsTbQ) as Cvoocmatc(oapvQ

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
PCB-1016 (1C)	0.21	U cn	0.27	0.21	0.11	ug/L		02/07/23 11:35	1
PCB-1221 (1C)	0.21	U cn	0.27	0.21	0.11	ug/L		02/07/23 11:35	1
PCB-1232 (1C)	0.21	U cn	0.27	0.21	0.11	ug/L		02/07/23 11:35	1
PCB-1242 (1C)	0.21	U cn	0.27	0.21	0.11	ug/L		02/07/23 11:35	1
PCB-1248 (1C)	0.21	U cn	0.27	0.21	0.11	ug/L		02/07/23 11:35	1
PCB-1254 (1C)	0.21	U cn	0.27	0.21	0.083	ug/L		02/07/23 11:35	1
PCB-1260 (1C)	0.21	U Q cn	0.27	0.21	0.083	ug/L		02/07/23 11:35	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl (Surr) (1C)	56	cn	10 - 148	02/06/23 15:35	02/07/23 11:35	1
DCB Decachlorobiphenyl (Surr) (2C)	64	cn	10 - 148	02/06/23 15:35	02/07/23 11:35	1
Tetrachloro-m-xylene (1C)	47	cn	33 - 137	02/06/23 15:35	02/07/23 11:35	1
Tetrachloro-m-xylene (2C)	52	cn	33 - 137	02/06/23 15:35	02/07/23 11:35	1

x etvc9: NWUf E-Dd - NcctvHest - Semi-wclatile f etocleum f oc9u/ ts G CT

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
C12-C24	92	U M	100	92	46	ug/L		02/09/23 06:15	1
C24-C40	250	U M	260	250	100	ug/L		02/09/23 06:15	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o- terphenyl (Surr)	71		50 - 150	02/08/23 15:38	02/09/23 06:15	1

x etvc9: SW24h h0M0B - x etals GCf Px ST- Uctal Re/ c8eoable

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
Arsenic	0.0017	U	0.0020	0.0017	0.00068	mg/L		02/03/23 11:11	1
Badium	**0.J00M4**		0.0020	0.0016	0.00075	mg/L		02/07/23 20:01	1
Cadmium	0.00040	U	0.00050	0.00040	0.00015	mg/L		02/03/23 11:11	1
Chromium	0.00080	U	0.0020	0.00080	0.00033	mg/L		02/03/23 11:11	1
Ccppeo	**0.J00r r 3**		0.0010	0.00090	0.00036	mg/L		02/03/23 11:11	1
Lead	0.00020	U	0.00050	0.00020	0.000071	mg/L		02/03/23 11:11	1
Nickel	0.00080	U	0.0015	0.00080	0.00040	mg/L		02/03/23 11:11	1
Selenium	0.00060	U	0.0010	0.00060	0.00028	mg/L		02/03/23 11:11	1
Silver	0.00030	U	0.00050	0.00030	0.00010	mg/L		02/03/23 11:11	1
Zin/	**0J10**		0.015	0.0080	0.0040	mg/L		02/03/23 11:11	1

x etvc9: SW24h 74705 - x ed/ ucQ Cw5 5 T

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
x ed/ ucQ	**0J026 3**		0.20	0.16	0.079	ug/L		02/01/23 13:36	1

Client Sample ID: NBKK-IDW1M-5 O-01Mr M6
Date Ccile/ te9: 01RMr RM6 16:1r
Date Re/ ei8e9: 01RM7RM6 0. :40

Lab Sample ID: 410-116211-M
x atcid: Wateo

) eneoal CvemistoQ

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
Alasvpcint G SW24h 1010T	>M00		50.0	50.0	50.0	Degrees F		02/08/23 14:00	1
Cyanide, Reactive (SW846 9012)	48	U	57	48	19	mg/Kg		02/09/23 10:18	1
Sulfide, Reactive (SW846 9034)	140	U	150	140	51	mg/Kg		02/08/23 11:57	1
pE G SW24h . 040CT	7J7	EA	0.01	0.01	0.01	S.U.		01/31/23 17:30	1
Ccoccsi8itQG SW24h . 040CT	Nc	EA	0.01	0.01	0.01	NONE		01/31/23 17:30	1

Client Sample ID: NBKK-IDW16-5 O-01Mr M6
Date Ccile/ te9: 01RMr RM6 16:60
Date Re/ ei8e9: 01RM7RM6 0. :40

Lab Sample ID: 410-116211-6
x atcid: Wateo

x etvc9: SW24h 2M70V Slx - Semi8clatile g c(ani/ Ccmpcun9s G CPx S Slx T

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
1-Methylnaphthalene	0.042	U	0.052	0.042	0.021	ug/L		02/02/23 20:13	1
2-Methylnaphthalene	0.042	U	0.052	0.042	0.021	ug/L		02/02/23 20:13	1
Acenaphthene	0.031	U	0.052	0.031	0.010	ug/L		02/02/23 20:13	1
Acenaphthylene	0.031	U	0.052	0.031	0.010	ug/L		02/02/23 20:13	1
Anthracene	0.031	U	0.052	0.031	0.010	ug/L		02/02/23 20:13	1
Benzo[a]anthracene	0.031	U	0.052	0.031	0.010	ug/L		02/02/23 20:13	1
Benzo[a]pyrene	0.031	U	0.052	0.031	0.010	ug/L		02/02/23 20:13	1
Benzo[b]fluoranthene	0.031	U	0.052	0.031	0.010	ug/L		02/02/23 20:13	1
Benzo[g,h,i]perylene	0.031	U	0.052	0.031	0.010	ug/L		02/02/23 20:13	1
Benzo[k]fluoranthene	0.031	U	0.052	0.031	0.010	ug/L		02/02/23 20:13	1
Chrysene	0.031	U	0.052	0.031	0.010	ug/L		02/02/23 20:13	1
Dibenz(a,h)anthracene	0.042	U	0.052	0.042	0.021	ug/L		02/02/23 20:13	1
Fluoranthene	0.031	U	0.052	0.031	0.010	ug/L		02/02/23 20:13	1
Fluorene	0.031	U	0.052	0.031	0.010	ug/L		02/02/23 20:13	1
Indeno[1,2,3-cd]pyrene	0.042	U	0.052	0.042	0.021	ug/L		02/02/23 20:13	1
Naphthalene	0.063	U	0.073	0.063	0.031	ug/L		02/02/23 20:13	1
Phenanthrene	0.063	U	0.073	0.063	0.031	ug/L		02/02/23 20:13	1
Pyrene	0.031	U	0.052	0.031	0.010	ug/L		02/02/23 20:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Benzo(a)pyrene-d12 (Surr)	*56*		*10 - 110*	*02/01/23 15:24*	*02/02/23 20:13*	*1*
Fluoranthene-d10 (Surr)	*90*		*47 - 128*	*02/01/23 15:24*	*02/02/23 20:13*	*1*
1-Methylnaphthalene-d10 (Surr)	*88*		*36 - 111*	*02/01/23 15:24*	*02/02/23 20:13*	*1*

x etvc9: NWUf E-) d - NcctvHest - wclatile f etocleum f oc9u/ ts G CT

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
C7-C12 (1C)	85	U M	250	85	43	ug/L		02/01/23 19:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*99*		*50 - 150*		*02/01/23 19:57*	*1*

x etvc9: SW24h 202M5 - f clQ/ vlcdnate9 BipvenQls G CBsTbQ) as Cvoccmatc(oapvQ

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
PCB-1016 (1C)	0.21	U M cn	0.26	0.21	0.10	ug/L		02/07/23 11:47	1
PCB-1221 (1C)	0.21	U cn	0.26	0.21	0.10	ug/L		02/07/23 11:47	1
PCB-1232 (1C)	0.21	U M cn	0.26	0.21	0.10	ug/L		02/07/23 11:47	1
PCB-1242 (1C)	0.21	U M cn	0.26	0.21	0.10	ug/L		02/07/23 11:47	1
PCB-1248 (1C)	0.21	U cn	0.26	0.21	0.10	ug/L		02/07/23 11:47	1
PCB-1254 (1C)	0.21	U cn	0.26	0.21	0.081	ug/L		02/07/23 11:47	1

Client Sample ID: NBKK-IDW16-5 O-01M r M6
Date Ccll e/ te9: 01 RM r RM6 16:60
Date Re/ ei8e9: 01 RM7 RM6 0. :40

Lab Sample ID: 410-116211-6
x atcid: Wateo

x etvc9: SW24h 202M5 - f clQ/ vlccinate9 BipvenQls G CBsTbQ) as Cvoccmatc(capvQGCcntinue9T

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
PCB-1260 (1C)	0.21	U Q cn	0.26	0.21	0.081	ug/L		02/07/23 11:47	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl (Surr) (1C)	*53*	*cn*	*10 - 148*	*02/06/23 15:35*	*02/07/23 11:47*	*1*
DCB Decachlorobiphenyl (Surr) (2C)	*62*	*cn*	*10 - 148*	*02/06/23 15:35*	*02/07/23 11:47*	*1*
Tetrachloro-m-xylene (1C)	*45*	*cn*	*33 - 137*	*02/06/23 15:35*	*02/07/23 11:47*	*1*
Tetrachloro-m-xylene (2C)	*49*	*cn*	*33 - 137*	*02/06/23 15:35*	*02/07/23 11:47*	*1*

x etvc9: NWUf E-Dd - NcctvHest - Semi-wclatile f etocleum f cc9u/ ts G CT

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
C12-C24	96	U M	110	96	48	ug/L		02/09/23 06:38	1
C24-C40	260	U M	270	260	110	ug/L		02/09/23 06:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o- terphenyl (Surr)	*78*		*50 - 150*	*02/08/23 15:38*	*02/09/23 06:38*	*1*

x etvc9: SW24h h0M0B - x etals GCf Rx ST- Uctal Re/ c8ecable

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
5 cseni/	0.J06r		0.0020	0.0017	0.00068	mg/L		02/08/23 08:44	1
Badum	0.J11		0.0020	0.0016	0.00075	mg/L		02/08/23 08:44	1
Cadmium	0.00040	U	0.00050	0.00040	0.00015	mg/L		02/08/23 08:44	1
Chromium	0.00080	U	0.0020	0.00080	0.00033	mg/L		02/08/23 08:44	1
Ccppeo	0.J0M4		0.0010	0.00090	0.00036	mg/L		02/08/23 08:44	1
Lea9	0.J001r	3	0.00050	0.00020	0.000071	mg/L		02/08/23 08:44	1
Ni/ kel	0.J01r		0.0015	0.00080	0.00040	mg/L		02/08/23 08:44	1
Selenium	0.00060	U	0.0010	0.00060	0.00028	mg/L		02/08/23 08:44	1
Silver	0.00030	U	0.00050	0.00030	0.00010	mg/L		02/08/23 08:44	1
Zinc	0.0080	U	0.015	0.0080	0.0040	mg/L		02/08/23 08:44	1

x etvc9: SW24h 74705 - x ed/ uoQGCw5 5 T

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
Mercury	0.16	U	0.20	0.16	0.079	ug/L		02/01/23 13:34	1

) eneoal CvemistoQ

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
Alasvpcint GSW24h 1010T	>M00		50.0	50.0	50.0	Degrees F		02/08/23 14:00	1
Cyanide, Reactive (SW846 9012)	49	U	59	49	20	mg/Kg		02/09/23 10:20	1
Sulfide, Reactive (SW846 9034)	140	U	160	140	52	mg/Kg		02/08/23 11:57	1
pE GSW24h . 040CT	7.h	EA	0.01	0.01	0.01	S.U.		01/31/23 17:30	1
Ccoccsi8itQGSW24h . 040CT	Nc	EA	0.01	0.01	0.01	NONE		01/31/23 17:30	1

Client Sample ID: NBKK-IDW14-5 O-01M r M6
Date Ccll e/ te9: 01 RM r RM6 16:4r
Date Re/ ei8e9: 01 RM7 RM6 0. :40

Lab Sample ID: 410-116211-4
x atcid: Wateo

x etvc9: SW24h 2M70V Slx - Semi8clatile g c(ani/ Ccmpcun9s G CRx S Slx T

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
1-Methylnaphthalene	0.044	U	0.055	0.044	0.022	ug/L		02/02/23 20:34	1
2-Methylnaphthalene	0.044	U	0.055	0.044	0.022	ug/L		02/02/23 20:34	1
Acenaphthene	0.033	U	0.055	0.033	0.011	ug/L		02/02/23 20:34	1
Acenaphthylene	0.033	U	0.055	0.033	0.011	ug/L		02/02/23 20:34	1

Client Sample Results

Client: Jacobs Engineering Group, Inc.
Project/Site: CTO-4117 NBK Keyport

Job ID: 410-113811-1
SDG: NBK Keyport

Client Sample ID: NBKK-IDW14-5O-01M M6

Lab Sample ID: 410-116211-4

Date Cclle/ te9: 01RM RM6 16:4r

x atcid: Wateo

Date Re/ ei8e9: 01RM7RM6 0. :40

x etvc9: SW24h 2M70V SIx - Semi8clatile g c(ani/ Ccmpcun9s G; CP x S SIx T(Ccntinue9T

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
Anthracene	0.033	U	0.055	0.033	0.011	ug/L		02/02/23 20:34	1
Benzo[a]anthracene	0.033	U	0.055	0.033	0.011	ug/L		02/02/23 20:34	1
Benzo[a]pyrene	0.033	U	0.055	0.033	0.011	ug/L		02/02/23 20:34	1
Benzo[b]fluoranthene	0.033	U	0.055	0.033	0.011	ug/L		02/02/23 20:34	1
Benzo[g,h,i]perylene	0.033	U	0.055	0.033	0.011	ug/L		02/02/23 20:34	1
Benzo[k]fluoranthene	0.033	U	0.055	0.033	0.011	ug/L		02/02/23 20:34	1
Chrysene	0.033	U	0.055	0.033	0.011	ug/L		02/02/23 20:34	1
Dibenz(a,h)anthracene	0.044	U	0.055	0.044	0.022	ug/L		02/02/23 20:34	1
Fluoranthene	0.033	U	0.055	0.033	0.011	ug/L		02/02/23 20:34	1
Fluorene	0.033	U	0.055	0.033	0.011	ug/L		02/02/23 20:34	1
Indeno[1,2,3-cd]pyrene	0.044	U	0.055	0.044	0.022	ug/L		02/02/23 20:34	1
Naphthalene	0.066	U	0.077	0.066	0.033	ug/L		02/02/23 20:34	1
Phenanthrene	0.066	U	0.077	0.066	0.033	ug/L		02/02/23 20:34	1
Pyrene	0.033	U	0.055	0.033	0.011	ug/L		02/02/23 20:34	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Benzo(a)pyrene-d12 (Surr)	*72*		*10 - 110*	*02/01/23 15:24*	*02/02/23 20:34*	*1*
Fluoranthene-d10 (Surr)	*94*		*47 - 128*	*02/01/23 15:24*	*02/02/23 20:34*	*1*
1-Methylnaphthalene-d10 (Surr)	*87*		*36 - 111*	*02/01/23 15:24*	*02/02/23 20:34*	*1*

x etvc9: NWUf E-) d - NcctvHest - wclatile f etccleum f cc9u/ ts G; CT

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
C7-C12 (1C)	85	U M	250	85	43	ug/L		02/01/23 20:23	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*99*		*50 - 150*		*02/01/23 20:23*	*1*

x etvc9: SW24h 202M5 - f clQ/ vlcdinate9 BipvenQls G; CBsTbQ) as Cvccmatc(capvQ

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
PCB-1016 (1C)	0.21	U cn	0.27	0.21	0.11	ug/L		02/07/23 11:59	1
PCB-1221 (1C)	0.21	U cn	0.27	0.21	0.11	ug/L		02/07/23 11:59	1
PCB-1232 (1C)	0.21	U cn	0.27	0.21	0.11	ug/L		02/07/23 11:59	1
PCB-1242 (1C)	0.21	U cn	0.27	0.21	0.11	ug/L		02/07/23 11:59	1
PCB-1248 (1C)	0.21	U cn	0.27	0.21	0.11	ug/L		02/07/23 11:59	1
PCB-1254 (1C)	0.21	U cn	0.27	0.21	0.083	ug/L		02/07/23 11:59	1
PCB-1260 (1C)	0.21	U Q cn	0.27	0.21	0.083	ug/L		02/07/23 11:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl (Surr) (1C)	*56*	*cn*	*10 - 148*	*02/06/23 15:35*	*02/07/23 11:59*	*1*
DCB Decachlorobiphenyl (Surr) (2C)	*65*	*cn*	*10 - 148*	*02/06/23 15:35*	*02/07/23 11:59*	*1*
Tetrachloro-m-xylene (1C)	*46*	*cn*	*33 - 137*	*02/06/23 15:35*	*02/07/23 11:59*	*1*
Tetrachloro-m-xylene (2C)	*52*	*cn*	*33 - 137*	*02/06/23 15:35*	*02/07/23 11:59*	*1*

x etvc9: NWUf E-Dd - NcctvHest - Semi-wclatile f etccleum f cc9u/ ts G; CT

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
C12-C24	96	U M	110	96	48	ug/L		02/09/23 07:23	1
C24-C40	260	U M	270	260	110	ug/L		02/09/23 07:23	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o- terphenyl (Surr)	*72*		*50 - 150*	*02/08/23 15:38*	*02/09/23 07:23*	*1*

Client Sample ID: NBKK-IDW14-5 O-01Mr M6 Lab Sample ID: 410-116211-4

Date Cclle/ te9: 01RMr RM6 16:4r **x atcid: Wateo**
Date Re/ ei8e9: 01RM7RM6 0. :40

x etvc9: SW24h h0M0B - x etals GCf Px ST- Uctal Re/ c8eoable

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	Fnit	D	5 nalQye9	Dil Aa/
5 oseni/	**0J0047**		0.0020	0.0017	0.00068	mg/L		02/03/23 10:53	1
Badum	**0J067**		0.0020	0.0016	0.00075	mg/L		02/07/23 20:21	1
Cadmium	0.00040	U	0.00050	0.00040	0.00015	mg/L		02/03/23 10:53	1
Chromium	0.00080	U	0.0020	0.00080	0.00033	mg/L		02/03/23 10:53	1
Ccppeo	**0J016**		0.0010	0.00090	0.00036	mg/L		02/03/23 10:53	1
Lea9	**0J001M**	**3**	0.00050	0.00020	0.000071	mg/L		02/03/23 10:53	1
Ni/ kel	**0J00M4**		0.0015	0.00080	0.00040	mg/L		02/03/23 10:53	1
Selenium	0.00060	U	0.0010	0.00060	0.00028	mg/L		02/03/23 10:53	1
Silver	0.00030	U	0.00050	0.00030	0.00010	mg/L		02/03/23 10:53	1
Zinc	0.0080	U	0.015	0.0080	0.0040	mg/L		02/03/23 10:53	1

x etvc9: SW24h 74705 - x eo/ uoQ GCw5 5 T

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	Fnit	D	5 nalQye9	Dil Aa/
Mercury	0.16	U	0.20	0.16	0.079	ug/L		02/01/23 13:19	1

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5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	Fnit	D	5 nalQye9	Dil Aa/
Alasvpcint GSW24h 1010T	**>M00**		50.0	50.0	50.0	Degrees F		02/08/23 14:00	1
Cyanide, Reactive (SW846 9012)	50	U	60	50	20	mg/Kg		02/09/23 10:25	1
Sulfide, Reactive (SW846 9034)	140	U	160	140	53	mg/Kg		02/08/23 11:57	1
pE GSW24h . 040CT	**2J**	**EA**	0.01	0.01	0.01	S.U.		01/31/23 17:30	1
Ccccsi8itQ GSW24h . 040CT	**Nc**	**EA**	0.01	0.01	0.01	NONE		01/31/23 17:30	1

Client Sample ID: NBKK-IDW1r -5 O-01Mr M6 Lab Sample ID: 410-116211-r

Date Cclle/ te9: 01RMr RM6 1M4r **x atcid: Wateo**
Date Re/ ei8e9: 01RM7RM6 0. :40

x etvc9: SW24h 2M70V SIx - Semi8clatile g o(ani/ Ccmpcun9s G CPx S SIx T

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	Fnit	D	5 nalQye9	Dil Aa/
1-Methylnaphthalene	0.042	U	0.052	0.042	0.021	ug/L		02/02/23 20:55	1
2-Methylnaphthalene	0.042	U	0.052	0.042	0.021	ug/L		02/02/23 20:55	1
Acenaphthene	0.031	U	0.052	0.031	0.010	ug/L		02/02/23 20:55	1
Acenaphthylene	0.031	U	0.052	0.031	0.010	ug/L		02/02/23 20:55	1
Anthracene	0.031	U	0.052	0.031	0.010	ug/L		02/02/23 20:55	1
Benzo[a]anthracene	0.031	U	0.052	0.031	0.010	ug/L		02/02/23 20:55	1
Benzo[a]pyrene	0.031	U	0.052	0.031	0.010	ug/L		02/02/23 20:55	1
Benzo[b]fluoranthene	0.031	U	0.052	0.031	0.010	ug/L		02/02/23 20:55	1
Benzo[g,h,i]perylene	0.031	U	0.052	0.031	0.010	ug/L		02/02/23 20:55	1
Benzo[k]fluoranthene	0.031	U	0.052	0.031	0.010	ug/L		02/02/23 20:55	1
Chrysene	0.031	U	0.052	0.031	0.010	ug/L		02/02/23 20:55	1
Dibenz(a,h)anthracene	0.042	U	0.052	0.042	0.021	ug/L		02/02/23 20:55	1
Fluoranthene	0.031	U	0.052	0.031	0.010	ug/L		02/02/23 20:55	1
Fluorene	0.031	U	0.052	0.031	0.010	ug/L		02/02/23 20:55	1
Indeno[1,2,3-cd]pyrene	0.042	U	0.052	0.042	0.021	ug/L		02/02/23 20:55	1
Naphthalene	0.063	U	0.073	0.063	0.031	ug/L		02/02/23 20:55	1
Phenanthrene	0.063	U	0.073	0.063	0.031	ug/L		02/02/23 20:55	1
Pyrene	0.031	U M	0.052	0.031	0.010	ug/L		02/02/23 20:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Benzo(a)pyrene-d12 (Surr)	*62*		*10 - 110*	*02/01/23 15:24*	*02/02/23 20:55*	*1*
Fluoranthene-d10 (Surr)	*89*		*47 - 128*	*02/01/23 15:24*	*02/02/23 20:55*	*1*

Client Sample ID: NBKK-IDW1r-5 O-01MrM6
Date Ccile/ te9: 01RMrRM6 1M4r
Date Re/ ei8e9: 01RM7RM6 0. :40

Lab Sample ID: 410-116211-r
x atcid: Wateo

x etvc9: SW24h 2M70V Slx - Semi8clatile g c(ani/ Ccmpcun9s G; CRx S Slx TGCcntinue9T

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene-d10 (Surr)	75		36 - 111	02/01/23 15:24	02/02/23 20:55	1

x etvc9: NWUf E-) d - NcctvHest - wclatile f etocleum f oc9u/ ts G; CT

5 nalQte	Result	Qualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
C7-C12 (1C)	85	U M	250	85	43	ug/L		02/01/23 20:48	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
a,a,a-Trifluorotoluene (fid) (1C)	99		50 - 150		02/01/23 20:48	1

x etvc9: SW24h 202M5 - f clQ/ vlccinate9 BipvenQls G CBsTbQ) as Cvoccmatc(oapvQ

5 nalQte	Result	Qualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
PCB-1016 (1C)	0.21	U cn	0.26	0.21	0.10	ug/L		02/07/23 12:11	1
PCB-1221 (1C)	0.21	U cn	0.26	0.21	0.10	ug/L		02/07/23 12:11	1
PCB-1232 (1C)	0.21	U cn	0.26	0.21	0.10	ug/L		02/07/23 12:11	1
PCB-1242 (1C)	0.21	U cn	0.26	0.21	0.10	ug/L		02/07/23 12:11	1
PCB-1248 (1C)	0.21	U cn	0.26	0.21	0.10	ug/L		02/07/23 12:11	1
PCB-1254 (1C)	0.21	U cn	0.26	0.21	0.081	ug/L		02/07/23 12:11	1
PCB-1260 (1C)	0.21	U Q cn	0.26	0.21	0.081	ug/L		02/07/23 12:11	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl (Surr) (1C)	62	cn	10 - 148	02/06/23 15:35	02/07/23 12:11	1
DCB Decachlorobiphenyl (Surr) (2C)	68	cn	10 - 148	02/06/23 15:35	02/07/23 12:11	1
Tetrachloro-m-xylene (1C)	45	cn	33 - 137	02/06/23 15:35	02/07/23 12:11	1
Tetrachloro-m-xylene (2C)	52	cn	33 - 137	02/06/23 15:35	02/07/23 12:11	1

x etvc9: NWUf E-Dd - NcctvHest - Semi-wclatile f etocleum f oc9u/ ts G; CT

5 nalQte	Result	Qualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
C12-C24	97	U M	110	97	49	ug/L		02/09/23 08:31	1
C24-C40	260	U M	270	260	110	ug/L		02/09/23 08:31	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o- terphenyl (Surr)	79		50 - 150	02/08/23 15:38	02/09/23 08:31	1

x etvc9: SW24h h0M0B - x etals GCf Rx ST- Uctal Re/ c8ecable

5 nalQte	Result	Qualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
5 cseni/	**0.J046**		0.0020	0.0017	0.00068	mg/L		02/03/23 11:15	1
Bacium	**0.J0M6**		0.0020	0.0016	0.00075	mg/L		02/07/23 20:23	1
Cadmium	0.00040	U	0.00050	0.00040	0.00015	mg/L		02/03/23 11:15	1
Chromium	0.00080	U	0.0020	0.00080	0.00033	mg/L		02/03/23 11:15	1
Ccppeo	**0.J00. 1 3**		0.0010	0.00090	0.00036	mg/L		02/03/23 11:15	1
Lead	0.00020	U	0.00050	0.00020	0.000071	mg/L		02/03/23 11:15	1
Ni/ kel	**0.J0M1**		0.0015	0.00080	0.00040	mg/L		02/03/23 11:15	1
Selenium	0.00060	U	0.0010	0.00060	0.00028	mg/L		02/03/23 11:15	1
Silver	0.00030	U	0.00050	0.00030	0.00010	mg/L		02/03/23 11:15	1
Zin/	**0.J0r 2 3**		0.015	0.0080	0.0040	mg/L		02/03/23 11:15	1

x etvc9: SW24h 74705 - x ed/ ucQ Cw5 5 T

5 nalQte	Result	Qualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
Mercury	0.16	U	0.20	0.16	0.079	ug/L		02/01/23 13:38	1

Client Sample ID: NBKK-IDW1r-5 O-01Mr M6
Lab Sample ID: 410-116211-r

Date Ccll e/ te9: 01RMr RM6 1M4r
x atdid: Wateo
Date Re/ ei8e9: 01RM7RM6 0. :40

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5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
Alasvpcint G SW24h 1010T	>M00		50.0	50.0	50.0	Degrees F		02/08/23 14:00	1
Cyanide, Reactive (SW846 9012)	50	U	60	50	20	mg/Kg		02/09/23 10:27	1
Sulfide, Reactive (SW846 9034)	140	U	160	140	53	mg/Kg		02/08/23 11:57	1
pE G SW24h . 040CT	2J0	EA	0.01	0.01	0.01	S.U.		01/31/23 17:30	1
Ccoccsi8itQG SW24h . 040CT	Nc	EA	0.01	0.01	0.01	NONE		01/31/23 17:30	1

Client Sample ID: NBKK-IDW1h-5 O-01Mr M6
Lab Sample ID: 410-116211-h

Date Ccll e/ te9: 01RMr RM6 1M60
x atdid: Wateo
Date Re/ ei8e9: 01RM7RM6 0. :40

x etvc9: SW24h 2M70V Slx - Semi8clatile g q(ani/ Ccmpcun9s G CRx S Slx T

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
1-x etvQnapvtvalene	r J1	/ n	0.053	0.042	0.021	ug/L		02/02/23 21:17	1
Mx etvQnapvtvalene	4J0	/ n	0.053	0.042	0.021	ug/L		02/02/23 21:17	1
Acenaphthene	0.032	U M cn	0.053	0.032	0.011	ug/L		02/02/23 21:17	1
Acenaphthylene	0.032	U M cn	0.053	0.032	0.011	ug/L		02/02/23 21:17	1
Anthracene	0.032	U M cn	0.053	0.032	0.011	ug/L		02/02/23 21:17	1
Benzo[a]anthracene	0.032	U M cn	0.053	0.032	0.011	ug/L		02/02/23 21:17	1
Benzo[a]pyrene	0.032	U M cn	0.053	0.032	0.011	ug/L		02/02/23 21:17	1
Benzo[b]fluoranthene	0.032	U M cn	0.053	0.032	0.011	ug/L		02/02/23 21:17	1
Benyc[( ]v]i,pecQene	0J11	x / n	0.053	0.032	0.011	ug/L		02/02/23 21:17	1
Benzo[k]fluoranthene	0.032	U M cn	0.053	0.032	0.011	ug/L		02/02/23 21:17	1
Chrysene	0.032	U M cn	0.053	0.032	0.011	ug/L		02/02/23 21:17	1
Dibenz(a,h)anthracene	0.042	U M cn	0.053	0.042	0.021	ug/L		02/02/23 21:17	1
Alucœantvene	0J1r	x / n	0.053	0.032	0.011	ug/L		02/02/23 21:17	1
Alucœene	0J6.	x / n	0.053	0.032	0.011	ug/L		02/02/23 21:17	1
In9enc[1]M6-/ 9,pQœene	0J044	3 x / n	0.053	0.042	0.021	ug/L		02/02/23 21:17	1
Napvtvalene	1J1	x / n	0.074	0.063	0.032	ug/L		02/02/23 21:17	1
f venantvœene	0J74	x / n	0.074	0.063	0.032	ug/L		02/02/23 21:17	1
f Qœene	0J62	x / n	0.053	0.032	0.011	ug/L		02/02/23 21:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Benzo(a)pyrene-d12 (Surr)	*9*	*M Q cn*	*10 - 110*	*02/01/23 15:24*	*02/02/23 21:17*	*1*
Fluoranthene-d10 (Surr)	*38*	*Q cn*	*47 - 128*	*02/01/23 15:24*	*02/02/23 21:17*	*1*
1-Methylnaphthalene-d10 (Surr)	*49*	*M cn*	*36 - 111*	*02/01/23 15:24*	*02/02/23 21:17*	*1*

x etvc9: SW24h 2M70V Slx - Semi8clatile g q(ani/ Ccmpcun9s G CRx S Slx T- RV

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
1-Methylnaphthalene	0.046	U H M	0.057	0.046	0.023	ug/L		02/08/23 04:36	1
2-Methylnaphthalene	0.046	U H M Q	0.057	0.046	0.023	ug/L		02/08/23 04:36	1
Acenaphthene	0.034	U H M	0.057	0.034	0.011	ug/L		02/08/23 04:36	1
Acenaphthylene	0.034	U H M	0.057	0.034	0.011	ug/L		02/08/23 04:36	1
Anthracene	0.034	U H M	0.057	0.034	0.011	ug/L		02/08/23 04:36	1
Benzo[a]anthracene	0.034	U H M	0.057	0.034	0.011	ug/L		02/08/23 04:36	1
Benzo[a]pyrene	0.034	U H M	0.057	0.034	0.011	ug/L		02/08/23 04:36	1
Benzo[b]fluoranthene	0.034	U H M	0.057	0.034	0.011	ug/L		02/08/23 04:36	1
Benyc[( ]v]i,pecQene	0J060	3 E	0.057	0.034	0.011	ug/L		02/08/23 04:36	1
Benzo[k]fluoranthene	0.034	U H M Q	0.057	0.034	0.011	ug/L		02/08/23 04:36	1
Chrysene	0.034	U H M	0.057	0.034	0.011	ug/L		02/08/23 04:36	1
Dibenz(a,h)anthracene	0.046	U H	0.057	0.046	0.023	ug/L		02/08/23 04:36	1

Client Sample ID: NBKK-IDW1h-5 O-01MrM6
Date Ccile/ te9: 01RMrRM6 1M60
Date Re/ ei8e9: 01RM7RM6 0. :40

Lab Sample ID: 410-116211-h
x atcid: Wateo

x etvc9: SW24h 2M70V Slx - Semi8clatile g c(ani/ Ccmpcun9s G CRx S Slx T- RV GCcntinue9T

5nalQte	Result	Oualizieo	Lg O	Lg D	DL	Fnit	D	5nalQye9	Dil Aa/
Fluoranthene	0.034	U H M	0.057	0.034	0.011	ug/L		02/08/23 04:36	1
Fluorene	0.034	U H M	0.057	0.034	0.011	ug/L		02/08/23 04:36	1
Indeno[1,2,3-cd]pyrene	0.046	U H M	0.057	0.046	0.023	ug/L		02/08/23 04:36	1
Naphthalene	0.068	U H M Q	0.080	0.068	0.034	ug/L		02/08/23 04:36	1
Phenanthrene	0.068	U H M Q	0.080	0.068	0.034	ug/L		02/08/23 04:36	1
f Qcene	0.071	E x	0.057	0.034	0.011	ug/L		02/08/23 04:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Benzo(a)pyrene-d12 (Surr)	*53*		*10 - 110*	*02/07/23 15:34*	*02/08/23 04:36*	*1*
Fluoranthene-d10 (Surr)	*79*		*47 - 128*	*02/07/23 15:34*	*02/08/23 04:36*	*1*
1-Methylnaphthalene-d10 (Surr)	*93*		*36 - 111*	*02/07/23 15:34*	*02/08/23 04:36*	*1*

x etvc9: NWUf E-) d - NcctvHest - wclatile f etocleum f oc9u/ ts G CT

5nalQte	Result	Oualizieo	Lg O	Lg D	DL	Fnit	D	5nalQye9	Dil Aa/
C7-C1MG CT	660	x	250	85	43	ug/L		02/01/23 21:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*96*		*50 - 150*		*02/01/23 21:13*	*1*

x etvc9: SW24h 202M5 - f clQ/ vlccinate9 BipvenQls G CBsTbQ) as Cvoocmatc(oapvQ

5nalQte	Result	Oualizieo	Lg O	Lg D	DL	Fnit	D	5nalQye9	Dil Aa/
PCB-1016 (1C)	0.22	U cn	0.28	0.22	0.11	ug/L		02/07/23 12:58	1
PCB-1221 (1C)	0.22	U cn	0.28	0.22	0.11	ug/L		02/07/23 12:58	1
PCB-1232 (1C)	0.22	U cn	0.28	0.22	0.11	ug/L		02/07/23 12:58	1
PCB-1242 (1C)	0.22	U cn	0.28	0.22	0.11	ug/L		02/07/23 12:58	1
PCB-1248 (1C)	0.22	U cn	0.28	0.22	0.11	ug/L		02/07/23 12:58	1
PCB-1254 (1C)	0.22	U cn	0.28	0.22	0.087	ug/L		02/07/23 12:58	1
PCB-1260 (1C)	0.22	U Q cn	0.28	0.22	0.087	ug/L		02/07/23 12:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl (Surr) (1C)	*44*	*cn*	*10 - 148*	*02/06/23 15:35*	*02/07/23 12:58*	*1*
DCB Decachlorobiphenyl (Surr) (2C)	*47*	*cn*	*10 - 148*	*02/06/23 15:35*	*02/07/23 12:58*	*1*
Tetrachloro-m-xylene (1C)	*43*	*cn*	*33 - 137*	*02/06/23 15:35*	*02/07/23 12:58*	*1*
Tetrachloro-m-xylene (2C)	*49*	*cn*	*33 - 137*	*02/06/23 15:35*	*02/07/23 12:58*	*1*

x etvc9: NWUf E-Dd - NcctvHest - Semi-wclatile f etocleum f oc9u/ ts G CT

5nalQte	Result	Oualizieo	Lg O	Lg D	DL	Fnit	D	5nalQye9	Dil Aa/
C1M-CM4	4. 00	x / n	100	92	46	ug/L		02/09/23 08:53	1
CM4-C40	h. 00	x / n	260	250	100	ug/L		02/09/23 08:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o- terphenyl (Surr)	*18*	*Q cn*	*50 - 150*	*02/08/23 15:38*	*02/09/23 08:53*	*1*

x etvc9: SW24h h0MDB - x etals GCf Rx ST- Uctal Re/ c8ecable

5nalQte	Result	Oualizieo	Lg O	Lg D	DL	Fnit	D	5nalQye9	Dil Aa/
5 oseni/	0.004r		0.010	0.0085	0.0034	mg/L		02/03/23 11:17	1
Bacium	1.1	B	0.010	0.0080	0.0037	mg/L		02/03/23 11:17	1
Ca9mium	0.00066		0.0025	0.0020	0.00076	mg/L		02/03/23 11:17	1
Cvoocmium	0.66		0.010	0.0040	0.0017	mg/L		02/03/23 11:17	1
Ccppeo	0.60		0.0050	0.0045	0.0018	mg/L		02/03/23 11:17	1
Lea9	0.1M		0.0025	0.0010	0.00036	mg/L		02/03/23 11:17	1

Client Sample ID: NBKK-IDW1h-5 O-01Mr M6
Date Ccll e/ te9: 01PMr PM6 1M60
Date Re/ ei8e9: 01PM7 PM6 0. :40

Lab Sample ID: 410-116211-h
x atcid: Wateo

x etvc9: SW24h h0MDB - x etals GCf Px ST- Uctal Re/ c8ecable GCcntinue9T

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
Ni/ kel	0J40		0.0075	0.0040	0.0020	mg/L		02/03/23 11:17	1
Selenium	0J00M0	3	0.0050	0.0030	0.0014	mg/L		02/03/23 11:17	1
Sil8eo	0J0011	3	0.0025	0.0015	0.00050	mg/L		02/03/23 11:17	1
Zin/	0Jr6		0.075	0.040	0.020	mg/L		02/03/23 11:17	1

x etvc9: SW24h 74705 - x ed/ ucQ GCw55T

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
x ed/ ucQ	0Jr2	3	1.0	0.80	0.40	ug/L		02/01/23 13:26	1

) eneoal CvemistoQ

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
Alasvpcint GSW24h 1010T	>M01		50.0	50.0	50.0	Degrees F		02/21/23 06:46	1
Cyanide, Reactive (SW846 9012)	49	U	59	49	20	mg/Kg		02/20/23 16:20	1
Sulfide, Reactive (SW846 9034)	140	U	160	140	52	mg/Kg		02/20/23 13:15	1
pE GSW24h . 040CT	7Jr	EA	0.01	0.01	0.01	S.U.		01/31/23 17:30	1
Ccoccsi8itQGSW24h . 040CT	Nc	EA	0.01	0.01	0.01	NONE		01/31/23 17:30	1

Client Sample ID: NBKK-IDW17-5 O-01Mr M6
Date Ccll e/ te9: 01PMr PM6 1M1r
Date Re/ ei8e9: 01PM7 PM6 0. :40

Lab Sample ID: 410-116211-7
x atcid: Wateo

x etvc9: SW24h 2M70V Slx - Semi8clatile g o(ani/ Ccmpcun9s G; CPx S Slx T

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
1-Methylnaphthalene	0.041	U	0.051	0.041	0.021	ug/L		02/02/23 21:38	1
2-Methylnaphthalene	0.041	U	0.051	0.041	0.021	ug/L		02/02/23 21:38	1
Acenaphthene	0.031	U	0.051	0.031	0.010	ug/L		02/02/23 21:38	1
Acenaphthylene	0.031	U M	0.051	0.031	0.010	ug/L		02/02/23 21:38	1
Anthracene	0.031	U M	0.051	0.031	0.010	ug/L		02/02/23 21:38	1
Benzo[a]anthracene	0.031	U	0.051	0.031	0.010	ug/L		02/02/23 21:38	1
Benzo[a]pyrene	0.031	U	0.051	0.031	0.010	ug/L		02/02/23 21:38	1
Benzo[b]fluoranthene	0.031	U	0.051	0.031	0.010	ug/L		02/02/23 21:38	1
Benzo[g,h,i]perylene	0.031	U	0.051	0.031	0.010	ug/L		02/02/23 21:38	1
Benzo[k]fluoranthene	0.031	U	0.051	0.031	0.010	ug/L		02/02/23 21:38	1
Chrysene	0.031	U M	0.051	0.031	0.010	ug/L		02/02/23 21:38	1
Dibenz(a,h)anthracene	0.041	U	0.051	0.041	0.021	ug/L		02/02/23 21:38	1
Fluoranthene	0.031	U M	0.051	0.031	0.010	ug/L		02/02/23 21:38	1
Fluorene	0.031	U	0.051	0.031	0.010	ug/L		02/02/23 21:38	1
Indeno[1,2,3-cd]pyrene	0.041	U M	0.051	0.041	0.021	ug/L		02/02/23 21:38	1
Naphthalene	0.062	U	0.072	0.062	0.031	ug/L		02/02/23 21:38	1
Phenanthrene	0.062	U	0.072	0.062	0.031	ug/L		02/02/23 21:38	1
Pyrene	0.031	U M	0.051	0.031	0.010	ug/L		02/02/23 21:38	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Benzo(a)pyrene-d12 (Surr)	*37*		*10 - 110*	*02/01/23 15:24*	*02/02/23 21:38*	*1*
Fluoranthene-d10 (Surr)	*98*		*47 - 128*	*02/01/23 15:24*	*02/02/23 21:38*	*1*
1-Methylnaphthalene-d10 (Surr)	*87*		*36 - 111*	*02/01/23 15:24*	*02/02/23 21:38*	*1*

x etvc9: NWUf E-) d - NcotvHest - wclatile f etocleum f oc9u/ ts G; CT

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
C7-C12 (1C)	85	U M	250	85	43	ug/L		02/01/23 21:38	1

Client Sample Results

Client: Jacobs Engineering Group, Inc. — Job ID: 410-113811-1
Project/Site: CTO-4117 NBK Keyport — SDG: NBK Keyport

Client Sample ID: NBKK-IDW17-5O-01M M6 — Lab Sample ID: 410-116211-7

Date Cclle/ te9: 01RM RM6 1M1r — **x atcid: Wateo**
Date Re/ ei8e9: 01RM7RM6 0. :40

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*98*		*50 - 150*		*02/01/23 21:38*	*1*

x etvc9: SW24h 202M5 - f clQ/ vlcdnate9 BipvenQls G CBsTbQ) as Cvccmatc(capvQ

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
PCB-1016 (1C)	0.22	U cn	0.28	0.22	0.11	ug/L		02/07/23 13:09	1
PCB-1221 (1C)	0.22	U cn	0.28	0.22	0.11	ug/L		02/07/23 13:09	1
PCB-1232 (1C)	0.22	U cn	0.28	0.22	0.11	ug/L		02/07/23 13:09	1
PCB-1242 (1C)	0.22	U cn	0.28	0.22	0.11	ug/L		02/07/23 13:09	1
PCB-1248 (1C)	0.22	U cn	0.28	0.22	0.11	ug/L		02/07/23 13:09	1
PCB-1254 (1C)	0.22	U cn	0.28	0.22	0.086	ug/L		02/07/23 13:09	1
PCB-1260 (1C)	0.22	U Q cn	0.28	0.22	0.086	ug/L		02/07/23 13:09	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl (Surr) (1C)	*67*	*cn*	*10 - 148*	*02/06/23 15:35*	*02/07/23 13:09*	*1*
DCB Decachlorobiphenyl (Surr) (2C)	*70*	*cn*	*10 - 148*	*02/06/23 15:35*	*02/07/23 13:09*	*1*
Tetrachloro-m-xylene (1C)	*48*	*cn*	*33 - 137*	*02/06/23 15:35*	*02/07/23 13:09*	*1*
Tetrachloro-m-xylene (2C)	*54*	*cn*	*33 - 137*	*02/06/23 15:35*	*02/07/23 13:09*	*1*

x etvc9: NWUf E-Dd - NcdvHest - Semi-wclatile f etccleum f cc9u/ ts G CT

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
C12-C24	95	U M	110	95	47	ug/L		02/09/23 09:16	1
C24-C40	250	U M	260	250	110	ug/L		02/09/23 09:16	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o- terphenyl (Surr)	*75*		*50 - 150*	*02/08/23 15:38*	*02/09/23 09:16*	*1*

x etvc9: SW24h h0M0B - x etals GCf Rx ST- Uctal Re/ c8ecable

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
5 cseni/	**0J00Mr**		0.0020	0.0017	0.00068	mg/L		02/08/23 08:42	1
Badum	**0J01.**		0.0020	0.0016	0.00075	mg/L		02/08/23 08:42	1
Cadmium	0.00040	U	0.00050	0.00040	0.00015	mg/L		02/08/23 08:42	1
Cvccmium	**0J0016**	**3**	0.0020	0.00080	0.00033	mg/L		02/08/23 08:42	1
Ccppeo	**0J00M7**		0.0010	0.00090	0.00036	mg/L		02/08/23 08:42	1
Lea9	**0J00072**		0.00050	0.00020	0.000071	mg/L		02/08/23 08:42	1
Ni/ kel	**0J006M**		0.0015	0.00080	0.00040	mg/L		02/08/23 08:42	1
Selenium	0.00060	U	0.0010	0.00060	0.00028	mg/L		02/08/23 08:42	1
Silver	0.00030	U	0.00050	0.00030	0.00010	mg/L		02/08/23 08:42	1
Zin/	**0J0. 4**	**3**	0.015	0.0080	0.0040	mg/L		02/08/23 08:42	1

x etvc9: SW24h 74705 - x ec/ uoQ GCw5 5 T

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
Mercury	0.16	U	0.20	0.16	0.079	ug/L		02/01/23 13:28	1

) enecal CvemistoQ

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
Alasvpcint GSW24h 1010T	**>M00**		50.0	50.0	50.0	Degrees F		02/21/23 06:46	1
Cyanide, Reactive (SW846 9012)	49	U	58	49	19	mg/Kg		02/20/23 16:20	1
Sulfide, Reactive (SW846 9034)	140	U	160	140	52	mg/Kg		02/20/23 13:15	1
pE GSW24h . 040CT	**7J2**	**EA**	0.01	0.01	0.01	S.U.		01/31/23 17:30	1
Cccocsi8itQGSW24h . 040CT	**Nc**	**EA**	0.01	0.01	0.01	NONE		01/31/23 17:30	1

Client Sample ID: NBKK-IDW12-5 O-01M r M6
Date Ccile/ te9: 01 M r M6 1M00
Date Re/ ei8e9: 01 M7 M6 0. :40

Lab Sample ID: 410-116211-2
x atcid: Wateo

x etvc9: SW24h 2M70V Slx - Semi8clatile g c(ani/ Ccmpcun9s G CRx S Slx T

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
1-Methylnaphthalene	0.042	U	0.052	0.042	0.021	ug/L		02/02/23 22:00	1
2-Methylnaphthalene	0.042	U	0.052	0.042	0.021	ug/L		02/02/23 22:00	1
Acenaphthene	0.031	U	0.052	0.031	0.010	ug/L		02/02/23 22:00	1
Acenaphthylene	0.031	U	0.052	0.031	0.010	ug/L		02/02/23 22:00	1
Anthracene	0.031	U	0.052	0.031	0.010	ug/L		02/02/23 22:00	1
Benzo[a]anthracene	0.031	U	0.052	0.031	0.010	ug/L		02/02/23 22:00	1
Benzo[a]pyrene	0.031	U	0.052	0.031	0.010	ug/L		02/02/23 22:00	1
Benzo[b]fluoranthene	0.031	U	0.052	0.031	0.010	ug/L		02/02/23 22:00	1
Benzo[g,h,i]perylene	0.031	U	0.052	0.031	0.010	ug/L		02/02/23 22:00	1
Benzo[k]fluoranthene	0.031	U	0.052	0.031	0.010	ug/L		02/02/23 22:00	1
Chrysene	0.031	U	0.052	0.031	0.010	ug/L		02/02/23 22:00	1
Dibenz(a,h)anthracene	0.042	U	0.052	0.042	0.021	ug/L		02/02/23 22:00	1
Fluoranthene	0.031	U	0.052	0.031	0.010	ug/L		02/02/23 22:00	1
Fluorene	0.031	U	0.052	0.031	0.010	ug/L		02/02/23 22:00	1
Indeno[1,2,3-cd]pyrene	0.042	U M	0.052	0.042	0.021	ug/L		02/02/23 22:00	1
Naphthalene	0.062	U	0.073	0.062	0.031	ug/L		02/02/23 22:00	1
Phenanthrene	0.062	U	0.073	0.062	0.031	ug/L		02/02/23 22:00	1
Pyrene	0.031	U	0.052	0.031	0.010	ug/L		02/02/23 22:00	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Benzo(a)pyrene-d12 (Surr)	*45*		*10 - 110*	*02/01/23 15:24*	*02/02/23 22:00*	*1*
Fluoranthene-d10 (Surr)	*102*		*47 - 128*	*02/01/23 15:24*	*02/02/23 22:00*	*1*
1-Methylnaphthalene-d10 (Surr)	*86*		*36 - 111*	*02/01/23 15:24*	*02/02/23 22:00*	*1*

x etvc9: NWUf E-) d - NcctvHest - wclatile f etocleum f cc9u/ ts G CT

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
C7-C12 (1C)	85	U M	250	85	43	ug/L		02/01/23 22:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*98*		*50 - 150*		*02/01/23 22:04*	*1*

x etvc9: SW24h 202M5 - f clQ/ vlccinate9 BipvenQls G CBsTbQ) as Cvoccmatc(capvQ

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
PCB-1016 (1C)	0.23	U cn	0.28	0.23	0.11	ug/L		02/07/23 13:21	1
PCB-1221 (1C)	0.23	U cn	0.28	0.23	0.11	ug/L		02/07/23 13:21	1
PCB-1232 (1C)	0.23	U cn	0.28	0.23	0.11	ug/L		02/07/23 13:21	1
PCB-1242 (1C)	0.23	U cn	0.28	0.23	0.11	ug/L		02/07/23 13:21	1
PCB-1248 (1C)	0.23	U cn	0.28	0.23	0.11	ug/L		02/07/23 13:21	1
PCB-1254 (1C)	0.23	U cn	0.28	0.23	0.089	ug/L		02/07/23 13:21	1
PCB-1260 (1C)	0.23	U Q cn	0.28	0.23	0.089	ug/L		02/07/23 13:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl (Surr) (1C)	*51*	*cn*	*10 - 148*	*02/06/23 15:35*	*02/07/23 13:21*	*1*
DCB Decachlorobiphenyl (Surr) (2C)	*54*	*cn*	*10 - 148*	*02/06/23 15:35*	*02/07/23 13:21*	*1*
Tetrachloro-m-xylene (1C)	*46*	*cn*	*33 - 137*	*02/06/23 15:35*	*02/07/23 13:21*	*1*
Tetrachloro-m-xylene (2C)	*52*	*cn*	*33 - 137*	*02/06/23 15:35*	*02/07/23 13:21*	*1*

x etvc9: NWUf E-Dd - NcctvHest - Semi-wclatile f etocleum f cc9u/ ts G CT

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
C1M-CM4	r1	3 x	110	95	48	ug/L		02/09/23 09:39	1
C24-C40	250	U M	270	250	110	ug/L		02/09/23 09:39	1

Client Sample ID: NBKK-IDW12-5 O-01MrM6
Date Ccll e/ te9: 01RMrRM6 1M00
Date Re/ ei8e9: 01RM7RM6 0. :40

Lab Sample ID: 410-116211-2
x atdid: Wateo

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o- terphenyl (Surr)	54		50 - 150	02/08/23 15:38	02/09/23 09:39	1

x etvc9: SW24h h0M0B - x etals GCf Rx ST- Uctal Re/ c8ecable

5 nalQte	Result	Qualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
5 cseni/	0.0041		0.0020	0.0017	0.00068	mg/L		02/03/23 10:38	1
Badium	0.04M		0.0020	0.0016	0.00075	mg/L		02/07/23 20:25	1
Cadmium	0.00040	U	0.00050	0.00040	0.00015	mg/L		02/03/23 10:38	1
Cvccmium	0.00. 0		0.0020	0.00080	0.00033	mg/L		02/03/23 10:38	1
Ccppeo	0.00. h		0.0010	0.00090	0.00036	mg/L		02/03/23 10:38	1
Lea9	0.0011		0.00050	0.00020	0.000071	mg/L		02/03/23 10:38	1
Ni/ kel	0.014		0.0015	0.00080	0.00040	mg/L		02/03/23 10:38	1
Selenium	0.00060	U	0.0010	0.00060	0.00028	mg/L		02/03/23 10:38	1
Silver	0.00030	U	0.00050	0.00030	0.00010	mg/L		02/03/23 10:38	1
Zin/	0.0Mh		0.015	0.0080	0.0040	mg/L		02/03/23 10:38	1

x etvc9: SW24h 74705 - x ed/ ucQ GCw5 5 T

5 nalQte	Result	Qualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
Mercury	0.16	U	0.20	0.16	0.079	ug/L		02/01/23 13:24	1

) eneoal CvemistoQ

5 nalQte	Result	Qualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
Alasvpcint GSW24h 1010T	>M01		50.0	50.0	50.0	Degrees F		02/21/23 06:46	1
Cyanide, Reactive (SW846 9012)	51	U	61	51	20	mg/Kg		02/20/23 16:20	1
Sulfide, Reactive (SW846 9034)	140	U	160	140	54	mg/Kg		02/20/23 13:15	1
pE GSW24h . 040CT	2.0 EA		0.01	0.01	0.01	S.U.		01/31/23 17:30	1
Ccoocsi8itQGSW24h . 040CT	Nc EA		0.01	0.01	0.01	NONE		01/31/23 17:30	1

Client Sample ID: NBKK-IDW1. -5 O-01MrM6
Date Ccll e/ te9: 01RMrRM6 11:4r
Date Re/ ei8e9: 01RM7RM6 0. :40

Lab Sample ID: 410-116211-.
x atdid: Wateo

x etvc9: SW24h 2M70V Slx - Semi8clatile g o(ani/ Ccmpcun9s G CPx S Slx T

5 nalQte	Result	Qualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
1-Methylnaphthalene	0.045	U	0.056	0.045	0.023	ug/L		02/02/23 22:21	1
2-Methylnaphthalene	0.045	U	0.056	0.045	0.023	ug/L		02/02/23 22:21	1
Acenaphthene	0.034	U M	0.056	0.034	0.011	ug/L		02/02/23 22:21	1
Acenaphthylene	0.034	U M	0.056	0.034	0.011	ug/L		02/02/23 22:21	1
Anthracene	0.034	U M	0.056	0.034	0.011	ug/L		02/02/23 22:21	1
Benzo[a]anthracene	0.034	U M	0.056	0.034	0.011	ug/L		02/02/23 22:21	1
Benzo[a]pyrene	0.034	U	0.056	0.034	0.011	ug/L		02/02/23 22:21	1
Benzo[b]fluoranthene	0.034	U	0.056	0.034	0.011	ug/L		02/02/23 22:21	1
Benzo[g,h,i]perylene	0.034	U	0.056	0.034	0.011	ug/L		02/02/23 22:21	1
Benzo[k]fluoranthene	0.034	U	0.056	0.034	0.011	ug/L		02/02/23 22:21	1
Chrysene	0.034	U	0.056	0.034	0.011	ug/L		02/02/23 22:21	1
Dibenz(a,h)anthracene	0.045	U	0.056	0.045	0.023	ug/L		02/02/23 22:21	1
Fluoranthene	0.034	U M	0.056	0.034	0.011	ug/L		02/02/23 22:21	1
Fluorene	0.034	U M	0.056	0.034	0.011	ug/L		02/02/23 22:21	1
Indeno[1,2,3-cd]pyrene	0.045	U	0.056	0.045	0.023	ug/L		02/02/23 22:21	1
Naphthalene	0.068	U	0.079	0.068	0.034	ug/L		02/02/23 22:21	1
Phenanthrene	0.068	U	0.079	0.068	0.034	ug/L		02/02/23 22:21	1
Pyrene	0.034	U M	0.056	0.034	0.011	ug/L		02/02/23 22:21	1

Client Sample Results

Client: Jacobs Engineering Group, Inc.
Project/Site: CTO-4117 NBK Keyport

Job ID: 410-113811-1
SDG: NBK Keyport

Client Sample ID: NBKK-IDW1. -5 O-01Mr M6

Lab Sample ID: 410-116211-.

Date Cclle/ te9: 01FMr FM6 11:4r
Date Re/ ei8e9: 01FM7FM6 0. :40

x atcid: Wateo

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Benzo(a)pyrene-d12 (Surr)	49		10 - 110	02/01/23 15:24	02/02/23 22:21	1
Fluoranthene-d10 (Surr)	98		47 - 128	02/01/23 15:24	02/02/23 22:21	1
1-Methylnaphthalene-d10 (Surr)	80		36 - 111	02/01/23 15:24	02/02/23 22:21	1

x etvc9: NWUf E-) d - NcdvHest - wclatile f etocleum f oc9u/ ts G CT

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
C7-C12 (1C)	85	U M	250	85	43	ug/L		02/01/23 22:29	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
a,a,a-Trifluorotoluene (fid) (1C)	95		50 - 150		02/01/23 22:29	1

x etvc9: SW24h 202M5 - f clQ/ vlcdinate9 BipvenQls G CBsTbQ) as Cvocmatc(oapvQ

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
PCB-1016 (1C)	0.23	U	0.28	0.23	0.11	ug/L		02/24/23 09:07	1
PCB-1221 (1C)	0.23	U	0.28	0.23	0.11	ug/L		02/24/23 09:07	1
PCB-1232 (1C)	0.23	U	0.28	0.23	0.11	ug/L		02/24/23 09:07	1
PCB-1242 (1C)	0.23	U	0.28	0.23	0.11	ug/L		02/24/23 09:07	1
PCB-1248 (1C)	0.23	U	0.28	0.23	0.11	ug/L		02/24/23 09:07	1
PCB-1254 (1C)	0.23	U	0.28	0.23	0.088	ug/L		02/24/23 09:07	1
PCB-1260 (1C)	0.23	U	0.28	0.23	0.088	ug/L		02/24/23 09:07	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl (Surr) (1C)	63		10 - 148	02/23/23 16:56	02/24/23 09:07	1
DCB Decachlorobiphenyl (Surr) (2C)	78		10 - 148	02/23/23 16:56	02/24/23 09:07	1
Tetrachloro-m-xylene (1C)	60		33 - 137	02/23/23 16:56	02/24/23 09:07	1
Tetrachloro-m-xylene (2C)	72		33 - 137	02/23/23 16:56	02/24/23 09:07	1

x etvc9: NWUf E-Dd - NcdvHest - Semi-wclatile f etocleum f oc9u/ ts G CT

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
C1M-CM4	**160**	**x**	110	100	50	ug/L		02/09/23 10:01	1
C24-C40	270	U M	280	270	110	ug/L		02/09/23 10:01	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o- terphenyl (Surr)	80		50 - 150	02/08/23 15:38	02/09/23 10:01	1

x etvc9: SW24h h0M0B - x etals G Cf Rx ST- Uctal Re/ c8ecable

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
Arsenic	0.0017	U	0.0020	0.0017	0.00068	mg/L		02/03/23 10:30	1
Badum	**0.J0Mh**		0.0020	0.0016	0.00075	mg/L		02/07/23 20:27	1
Cadmium	0.00040	U	0.00050	0.00040	0.00015	mg/L		02/03/23 10:30	1
Cvocmium	**0.J01.**	**3**	0.0020	0.00080	0.00033	mg/L		02/03/23 10:30	1
Ccppeo	**0.J00M7**		0.0010	0.00090	0.00036	mg/L		02/03/23 10:30	1
Lea9	**0.J004M**	**3**	0.00050	0.00020	0.000071	mg/L		02/03/23 10:30	1
Ni/ kel	**0.J00hr**		0.0015	0.00080	0.00040	mg/L		02/03/23 10:30	1
Selenium	0.00060	U	0.0010	0.00060	0.00028	mg/L		02/03/23 10:30	1
Silver	0.00030	U	0.00050	0.00030	0.00010	mg/L		02/03/23 10:30	1
Zin/	**0.J002M**	**3**	0.015	0.0080	0.0040	mg/L		02/03/23 10:30	1

x etvc9: SW24h 74705 - x ed uoQ Cw5 5 T

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
Mercury	0.16	U	0.20	0.16	0.079	ug/L		02/01/23 13:22	1

Client Sample ID: NBKK-IDW1. -5 O-01MrM6
Lab Sample ID: 410-116211-.

Date Ccl le/ te9: 01RMrRM6 11:4r
x atcid: Wateo
Date Re/ ei8e9: 01RM7RM6 0. :40

) eneoal CvemistoQ

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
Alasvpcint GSW24h 1010T	>M00		50.0	50.0	50.0	Degrees F		02/21/23 06:46	1
Cyanide, Reactive (SW846 9012)	48	U	57	48	19	mg/Kg		02/20/23 16:21	1
Sulfide, Reactive (SW846 9034)	140	U	150	140	51	mg/Kg		02/20/23 13:15	1
pE GSW24h . 040CT	7.M EA		0.01	0.01	0.01	S.U.		01/31/23 17:30	1
Ccoccsi8itQGSW24h . 040CT	Nc EA		0.01	0.01	0.01	NONE		01/31/23 17:30	1

Client Sample ID: NBKK-IDWM0-5 O-01MrM6
Lab Sample ID: 410-116211-10

Date Ccl le/ te9: 01RMrRM6 11:M0
x atcid: Wateo
Date Re/ ei8e9: 01RM7RM6 0. :40

x etvc9: SW24h 2M70V Slx - Semi8clatile g c(ani/ Ccmpcun9s GC Rx S Slx T

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
1-Methylnaphthalene	0.042	U	0.053	0.042	0.021	ug/L		02/02/23 22:43	1
2-Methylnaphthalene	0.042	U	0.053	0.042	0.021	ug/L		02/02/23 22:43	1
Acenaphthene	0.032	U	0.053	0.032	0.011	ug/L		02/02/23 22:43	1
Acenaphthylene	0.032	U	0.053	0.032	0.011	ug/L		02/02/23 22:43	1
Anthracene	0.032	U M	0.053	0.032	0.011	ug/L		02/02/23 22:43	1
Benzo[a]anthracene	0.032	U M	0.053	0.032	0.011	ug/L		02/02/23 22:43	1
Benzo[a]pyrene	0.032	U	0.053	0.032	0.011	ug/L		02/02/23 22:43	1
Benzo[b]fluoranthene	0.032	U	0.053	0.032	0.011	ug/L		02/02/23 22:43	1
Benzo[g,h,i]perylene	0.032	U	0.053	0.032	0.011	ug/L		02/02/23 22:43	1
Benzo[k]fluoranthene	0.032	U	0.053	0.032	0.011	ug/L		02/02/23 22:43	1
Chrysene	0.032	U	0.053	0.032	0.011	ug/L		02/02/23 22:43	1
Dibenz(a,h)anthracene	0.042	U	0.053	0.042	0.021	ug/L		02/02/23 22:43	1
Fluoranthene	0.032	U M	0.053	0.032	0.011	ug/L		02/02/23 22:43	1
Fluorene	0.032	U	0.053	0.032	0.011	ug/L		02/02/23 22:43	1
Indeno[1,2,3-cd]pyrene	0.042	U M	0.053	0.042	0.021	ug/L		02/02/23 22:43	1
Naphthalene	0.063	U	0.074	0.063	0.032	ug/L		02/02/23 22:43	1
Phenanthrene	0.063	U	0.074	0.063	0.032	ug/L		02/02/23 22:43	1
Pyrene	0.032	U M	0.053	0.032	0.011	ug/L		02/02/23 22:43	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Benzo(a)pyrene-d12 (Surr)	*40*		*10 - 110*	*02/01/23 15:24*	*02/02/23 22:43*	*1*
Fluoranthene-d10 (Surr)	*97*		*47 - 128*	*02/01/23 15:24*	*02/02/23 22:43*	*1*
1-Methylnaphthalene-d10 (Surr)	*77*		*36 - 111*	*02/01/23 15:24*	*02/02/23 22:43*	*1*

x etvc9: NWUf E-) d - NcctvHest - wclatile f etocleum f oc9u/ ts GC CT

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
C7-C12 (1C)	85	U M	250	85	43	ug/L		02/01/23 23:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*97*		*50 - 150*		*02/01/23 23:19*	*1*

x etvc9: SW24h 202M5 - f clQ/ vlcdnate9 BipvenQls GC CBsTbQ) as Cvoccmatc(oapvQ

5 nalQte	Result	Oualizieo	Lg O	Lg D	DL	F nit	D	5 nalQye9	Dil Aa/
PCB-1016 (1C)	0.21	U cn	0.27	0.21	0.11	ug/L		02/07/23 13:46	1
PCB-1221 (1C)	0.21	U cn	0.27	0.21	0.11	ug/L		02/07/23 13:46	1
PCB-1232 (1C)	0.21	U cn	0.27	0.21	0.11	ug/L		02/07/23 13:46	1
PCB-1242 (1C)	0.21	U cn	0.27	0.21	0.11	ug/L		02/07/23 13:46	1
PCB-1248 (1C)	0.21	U cn	0.27	0.21	0.11	ug/L		02/07/23 13:46	1
PCB-1254 (1C)	0.21	U cn	0.27	0.21	0.083	ug/L		02/07/23 13:46	1

Client Sample ID: NBKK-IDWM0-5 O-01Mr M6
Date Ccile/ te9: 01RMr RM6 11:M0
Date Re/ ei8e9: 01RM7RM6 0. :40

Lab Sample ID: 410-116211-10
x atcid: Wateo

x etvc9: SW24h 202M5 - f clQ/ vlccinate9 BipvenQls G CBsTbQ) as Cvoccmatc(capvQGCcntinue9T

5nalQte	Result	Oualizieo	Lg O	Lg D	DL	Fnit	D	5nalQye9	Dil Aa/
PCB-1260 (1C)	0.21	U Q cn	0.27	0.21	0.083	ug/L		02/07/23 13:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl (Surr) (1C)	*53*	*cn*	*10 - 148*	*02/06/23 15:35*	*02/07/23 13:46*	*1*
DCB Decachlorobiphenyl (Surr) (2C)	*54*	*cn*	*10 - 148*	*02/06/23 15:35*	*02/07/23 13:46*	*1*
Tetrachloro-m-xylene (1C)	*59*	*cn*	*33 - 137*	*02/06/23 15:35*	*02/07/23 13:46*	*1*
Tetrachloro-m-xylene (2C)	*64*	*cn*	*33 - 137*	*02/06/23 15:35*	*02/07/23 13:46*	*1*

x etvc9: NWUf E-Dd - NcctvHest - Semi-wclatile f etocleum f cc9u/ ts G CT

5nalQte	Result	Oualizieo	Lg O	Lg D	DL	Fnit	D	5nalQye9	Dil Aa/
C12-C24	100	U M	110	100	52	ug/L		02/09/23 10:46	1
C24-C40	270	U M	290	270	110	ug/L		02/09/23 10:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o- terphenyl (Surr)	*73*		*50 - 150*	*02/08/23 15:38*	*02/09/23 10:46*	*1*

x etvc9: SW24h h0M0B - x etals GCf Rx ST- Uctal Re/ c8ecable

5nalQte	Result	Oualizieo	Lg O	Lg D	DL	Fnit	D	5nalQye9	Dil Aa/
5 cseni/	**0.J0. M**		0.0020	0.0017	0.00068	mg/L		02/03/23 10:40	1
Badium	**0.J12**	**B**	0.0020	0.0016	0.00075	mg/L		02/03/23 10:40	1
Ca9mium	**0.J007r**		0.00050	0.00040	0.00015	mg/L		02/03/23 10:40	1
Cvoccmium	**0.J40**		0.0020	0.00080	0.00033	mg/L		02/03/23 10:40	1
Ccppeo	**0.J41**		0.0010	0.00090	0.00036	mg/L		02/03/23 10:40	1
Lea9	**0.J14**		0.00050	0.00020	0.000071	mg/L		02/03/23 10:40	1
Ni/ kel	**0.J4M**		0.0015	0.00080	0.00040	mg/L		02/03/23 10:40	1
Selenium	**0.J00h7**	**3**	0.0010	0.00060	0.00028	mg/L		02/03/23 10:40	1
Silver	0.00030	U	0.00050	0.00030	0.00010	mg/L		02/03/23 10:40	1
Zin/	**0.J. 0**		0.015	0.0080	0.0040	mg/L		02/03/23 10:40	1

x etvc9: SW24h 74705 - x ec/ uoQGCw5 5T

5nalQte	Result	Oualizieo	Lg O	Lg D	DL	Fnit	D	5nalQye9	Dil Aa/
Mercury	0.16	U	0.20	0.16	0.079	ug/L		02/01/23 13:40	1

) eneoal CvemistoQ

5nalQte	Result	Oualizieo	Lg O	Lg D	DL	Fnit	D	5nalQye9	Dil Aa/
Alasvpcint GSW24h 1010T	**>M01**		50.0	50.0	50.0	Degrees F		02/21/23 06:46	1
Cyanide, Reactive (SW846 9012)	49	U	59	49	20	mg/Kg		02/20/23 16:22	1
Sulfide, Reactive (SW846 9034)	140	U	160	140	53	mg/Kg		02/20/23 13:15	1
pE GSW24h . 040CT	**7Jr**	**EA**	0.01	0.01	0.01	S.U.		01/31/23 17:30	1
CcoccsiBitQGSW24h . 040CT	**Nc**	**EA**	0.01	0.01	0.01	NONE		01/31/23 17:30	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)		
Lab Sample ID	Client Sample ID	BAPd12 (10-110)	FLN10 (47-128)	MNPd10 (36-111)
410-113811-1	NBKK-IDW11-AQ-012523	73	97	88
410-113811-2	NBKK-IDW12-AQ-012523	53	94	90
410-113811-3	NBKK-IDW13-AQ-012523	56	90	88
410-113811-4	NBKK-IDW14-AQ-012523	72	94	87
410-113811-5	NBKK-IDW15-AQ-012523	62	89	75
410-113811-6	NBKK-IDW16-AQ-012523	9 M Q cn	38 Q cn	49 M cn
410-113811-6 - RE	NBKK-IDW16-AQ-012523	53	79	93
410-113811-7	NBKK-IDW17-AQ-012523	37	98	87
410-113811-8	NBKK-IDW18-AQ-012523	45	102	86
410-113811-9	NBKK-IDW19-AQ-012523	49	98	80
410-113811-10	NBKK-IDW20-AQ-012523	40	97	77
LCS 410-340624/2-A	Lab Control Sample	94	95	75
LCS 410-342372/2-A	Lab Control Sample	96	95	84
LCSD 410-340624/3-A	Lab Control Sample Dup	98	96	80
LCSD 410-342372/3-A	Lab Control Sample Dup	99	98	88
MB 410-340624/1-A	Method Blank	92	96	91
MB 410-342372/1-A	Method Blank	93	94	91

Surrogate Legend

BAPd12 = Benzo(a)pyrene-d12 (Surr)
FLN10 = Fluoranthene-d10 (Surr)
MNPd10 = 1-Methylnaphthalene-d10 (Surr)

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
Lab Sample ID	Client Sample ID	TFT-F1 (50-150)
410-113811-1	NBKK-IDW11-AQ-012523	99
410-113811-2	NBKK-IDW12-AQ-012523	99
410-113811-3	NBKK-IDW13-AQ-012523	99
410-113811-4	NBKK-IDW14-AQ-012523	99
410-113811-5	NBKK-IDW15-AQ-012523	99
410-113811-6	NBKK-IDW16-AQ-012523	96
410-113811-7	NBKK-IDW17-AQ-012523	98
410-113811-8	NBKK-IDW18-AQ-012523	98
410-113811-9	NBKK-IDW19-AQ-012523	95
410-113811-10	NBKK-IDW20-AQ-012523	97
LCS 410-340603/6	Lab Control Sample	83
LCSD 410-340603/7	Lab Control Sample Dup	83
MB 410-340603/5	Method Blank	99

Surrogate Legend

TFT-F = a,a,a-Trifluorotoluene (fid)

Surrogate Summary

Client: Jacobs Engineering Group, Inc.
Project/Site: CTO-4117 NBK Keyport

Job ID: 410-113811-1
SDG: NBK Keyport

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
		DCB1	DCB2	TCX1	TCX2
Lab Sample ID	Client Sample ID	(10-148)	(10-148)	(33-137)	(33-137)
410-113811-1	NBKK-IDW11-AQ-012523	39 cn	45 cn	51 cn	56 cn
410-113811-2	NBKK-IDW12-AQ-012523	56 cn	64 cn	47 cn	52 cn
410-113811-3	NBKK-IDW13-AQ-012523	53 cn	62 cn	45 cn	49 cn
410-113811-4	NBKK-IDW14-AQ-012523	56 cn	65 cn	46 cn	52 cn
410-113811-5	NBKK-IDW15-AQ-012523	62 cn	68 cn	45 cn	52 cn
410-113811-6	NBKK-IDW16-AQ-012523	44 cn	47 cn	43 cn	49 cn
410-113811-7	NBKK-IDW17-AQ-012523	67 cn	70 cn	48 cn	54 cn
410-113811-8	NBKK-IDW18-AQ-012523	51 cn	54 cn	46 cn	52 cn
410-113811-9	NBKK-IDW19-AQ-012523	63	78	60	72
410-113811-10	NBKK-IDW20-AQ-012523	53 cn	54 cn	59 cn	64 cn
LCS 410-342006/2-A	Lab Control Sample	76	74	45	49
LCS 410-347500/2-A	Lab Control Sample	32	38	46	61
LCSD 410-342006/3-A	Lab Control Sample Dup	39	40	27 Q	32 Q
MB 410-342006/1-A	Method Blank	69	69	20 Q	23 Q
MB 410-347500/1-A	Method Blank	53	63	45	59

Surrogate Legend

DCB = DCB Decachlorobiphenyl (Surr)
TCX = Tetrachloro-m-xylene

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)
		OTP
Lab Sample ID	Client Sample ID	(50-150)
410-113811-1	NBKK-IDW11-AQ-012523	87
410-113811-2	NBKK-IDW12-AQ-012523	71
410-113811-3	NBKK-IDW13-AQ-012523	78
410-113811-3 DU	NBKK-IDW13-AQ-012523	70
410-113811-4	NBKK-IDW14-AQ-012523	72
410-113811-5	NBKK-IDW15-AQ-012523	79
410-113811-6	NBKK-IDW16-AQ-012523	18 Q cn
410-113811-7	NBKK-IDW17-AQ-012523	75
410-113811-8	NBKK-IDW18-AQ-012523	54
410-113811-9	NBKK-IDW19-AQ-012523	80
410-113811-9 DU	NBKK-IDW19-AQ-012523	79
410-113811-10	NBKK-IDW20-AQ-012523	73
LCS 410-342797/2-A	Lab Control Sample	77
LCSD 410-342797/3-A	Lab Control Sample Dup	83
MB 410-342797/1-A	Method Blank	81

Surrogate Legend

OTP = o- terphenyl (Surr)

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Lab Sample ID: MB 410-340624/1-A
Matrix: Water
Analysis Batch: 340790

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 340624

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
1-Methylnaphthalene	0.040	U	0.050	0.040	0.020	ug/L		02/02/23 05:23	1
2-Methylnaphthalene	0.040	U	0.050	0.040	0.020	ug/L		02/02/23 05:23	1
Acenaphthene	0.030	U	0.050	0.030	0.010	ug/L		02/02/23 05:23	1
Acenaphthylene	0.030	U	0.050	0.030	0.010	ug/L		02/02/23 05:23	1
Anthracene	0.030	U	0.050	0.030	0.010	ug/L		02/02/23 05:23	1
Benzo[a]anthracene	0.030	U	0.050	0.030	0.010	ug/L		02/02/23 05:23	1
Benzo[a]pyrene	0.030	U	0.050	0.030	0.010	ug/L		02/02/23 05:23	1
Benzo[b]fluoranthene	0.030	U	0.050	0.030	0.010	ug/L		02/02/23 05:23	1
Benzo[g,h,i]perylene	0.030	U	0.050	0.030	0.010	ug/L		02/02/23 05:23	1
Benzo[k]fluoranthene	0.030	U	0.050	0.030	0.010	ug/L		02/02/23 05:23	1
Chrysene	0.030	U	0.050	0.030	0.010	ug/L		02/02/23 05:23	1
Dibenz(a,h)anthracene	0.040	U	0.050	0.040	0.020	ug/L		02/02/23 05:23	1
Fluoranthene	0.030	U	0.050	0.030	0.010	ug/L		02/02/23 05:23	1
Fluorene	0.030	U	0.050	0.030	0.010	ug/L		02/02/23 05:23	1
Indeno[1,2,3-cd]pyrene	0.040	U	0.050	0.040	0.020	ug/L		02/02/23 05:23	1
Naphthalene	0.060	U	0.070	0.060	0.030	ug/L		02/02/23 05:23	1
Phenanthrene	0.060	U	0.070	0.060	0.030	ug/L		02/02/23 05:23	1
Pyrene	0.030	U	0.050	0.030	0.010	ug/L		02/02/23 05:23	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Benzo(a)pyrene-d12 (Surr)	*72*		*13 - 113*	*320310 2/ 15:24*	*320320 2/ 35:2/*	*1*
Fluoranthene-d13 (Surr)	*79*		*48 - 12M*	*320310 2/ 15:24*	*320320 2/ 35:2/*	*1*
1-6 ethylnaphthalene-d13 (Surr)	*71*		*/ 9 - 111*	*320310 2/ 15:24*	*320320 2/ 35:2/*	*1*

Lab Sample ID: LCS 410-340624/2-A
Matrix: Water
Analysis Batch: 340790

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 340624

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1-Methylnaphthalene	1.00	0.720		ug/L		72	41 - 115
2-Methylnaphthalene	1.00	0.670		ug/L		67	39 - 114
Acenaphthene	1.00	0.923		ug/L		92	48 - 114
Acenaphthylene	1.00	0.872		ug/L		87	35 - 121
Anthracene	1.00	0.963		ug/L		96	53 - 119
Benzo[a]anthracene	1.00	0.912		ug/L		91	59 - 120
Benzo[a]pyrene	1.00	0.975		ug/L		98	53 - 120
Benzo[b]fluoranthene	1.00	0.933		ug/L		93	53 - 126
Benzo[g,h,i]perylene	1.00	0.902		ug/L		90	44 - 128
Benzo[k]fluoranthene	1.00	1.06		ug/L		106	54 - 125
Chrysene	1.00	0.911		ug/L		91	57 - 120
Dibenz(a,h)anthracene	1.00	0.902		ug/L		90	44 - 131
Fluoranthene	1.00	0.932		ug/L		93	58 - 120
Fluorene	1.00	0.888		ug/L		89	50 - 118
Indeno[1,2,3-cd]pyrene	1.00	0.939	M	ug/L		94	48 - 130
Naphthalene	1.00	0.815		ug/L		82	43 - 114
Phenanthrene	1.00	0.983		ug/L		98	53 - 115
Pyrene	1.00	0.869		ug/L		87	53 - 121

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Lab Sample ID: LCS 410-340624/2-A
Matrix: Water
Analysis Batch: 340790

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 340624

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Benzo(a)pyrene-d12 (Surr)	*74*		*13 - 113*
Fluoranthene-d13 (Surr)	*75*		*48 - 12M*
1-6 ethylnaphthalene-d13 (Surr)	*85*		*/ 9 - 111*

Lab Sample ID: LCSD 410-340624/3-A
Matrix: Water
Analysis Batch: 340790

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 340624

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
1-Methylnaphthalene			1.00	0.755		ug/L		76	41 - 115	5	20
2-Methylnaphthalene			1.00	0.712		ug/L		71	39 - 114	6	20
Acenaphthene			1.00	0.950		ug/L		95	48 - 114	3	20
Acenaphthylene			1.00	0.895		ug/L		90	35 - 121	3	20
Anthracene			1.00	1.00		ug/L		100	53 - 119	4	20
Benzo[a]anthracene			1.00	0.976		ug/L		98	59 - 120	7	20
Benzo[a]pyrene			1.00	1.01		ug/L		101	53 - 120	3	20
Benzo[b]fluoranthene			1.00	0.944		ug/L		94	53 - 126	1	20
Benzo[g,h,i]perylene			1.00	0.913		ug/L		91	44 - 128	1	20
Benzo[k]fluoranthene			1.00	1.11		ug/L		111	54 - 125	5	20
Chrysene			1.00	0.921		ug/L		92	57 - 120	1	20
Dibenz(a,h)anthracene			1.00	0.911		ug/L		91	44 - 131	1	20
Fluoranthene			1.00	0.949		ug/L		95	58 - 120	2	20
Fluorene			1.00	0.905		ug/L		91	50 - 118	2	20
Indeno[1,2,3-cd]pyrene			1.00	0.957	M	ug/L		96	48 - 130	2	20
Naphthalene			1.00	0.865		ug/L		86	43 - 114	6	20
Phenanthrene			1.00	1.00		ug/L		100	53 - 115	2	20
Pyrene			1.00	0.899		ug/L		90	53 - 121	3	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Benzo(a)pyrene-d12 (Surr)	*7M*		*13 - 113*
Fluoranthene-d13 (Surr)	*79*		*48 - 12M*
1-6 ethylnaphthalene-d13 (Surr)	*M*		*/ 9 - 111*

Lab Sample ID: MB 410-342372/1-A
Matrix: Water
Analysis Batch: 342434

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 342372

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
1-Methylnaphthalene	0.040	U	0.050	0.040	0.020	ug/L		02/08/23 03:32	1
2-Methylnaphthalene	0.040	U	0.050	0.040	0.020	ug/L		02/08/23 03:32	1
Acenaphthene	0.030	U	0.050	0.030	0.010	ug/L		02/08/23 03:32	1
Acenaphthylene	0.030	U	0.050	0.030	0.010	ug/L		02/08/23 03:32	1
Anthracene	0.030	U	0.050	0.030	0.010	ug/L		02/08/23 03:32	1
Benzo[a]anthracene	0.030	U	0.050	0.030	0.010	ug/L		02/08/23 03:32	1
Benzo[a]pyrene	0.030	U	0.050	0.030	0.010	ug/L		02/08/23 03:32	1
Benzo[b]fluoranthene	0.030	U	0.050	0.030	0.010	ug/L		02/08/23 03:32	1
Benzo[g,h,i]perylene	0.030	U	0.050	0.030	0.010	ug/L		02/08/23 03:32	1
Benzo[k]fluoranthene	0.030	U	0.050	0.030	0.010	ug/L		02/08/23 03:32	1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Lab Sample ID: MB 410-342372/1-A
Matrix: Water
Analysis Batch: 342434

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 342372

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Chrysene	0.030	U	0.050	0.030	0.010	ug/L		02/08/23 03:32	1
Dibenz(a,h)anthracene	0.040	U	0.050	0.040	0.020	ug/L		02/08/23 03:32	1
Fluoranthene	0.030	U	0.050	0.030	0.010	ug/L		02/08/23 03:32	1
Fluorene	0.030	U	0.050	0.030	0.010	ug/L		02/08/23 03:32	1
Indeno[1,2,3-cd]pyrene	0.040	U	0.050	0.040	0.020	ug/L		02/08/23 03:32	1
Naphthalene	0.060	U	0.070	0.060	0.030	ug/L		02/08/23 03:32	1
Phenanthrene	0.060	U	0.070	0.060	0.030	ug/L		02/08/23 03:32	1
Pyrene	0.030	U	0.050	0.030	0.010	ug/L		02/08/23 03:32	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Benzo(a)pyrene-d12 (Surr)	*7/*		*13 - 113*	*320380 2/ 15:/ 4*	*320380 2/ 3/ :/ 2*	*1*
Fluoranthene-d13 (Surr)	*74*		*48 - 12M*	*320380 2/ 15:/ 4*	*320380 2/ 3/ :/ 2*	*1*
1-6 ethylnaphthalene-d13 (Surr)	*71*		*/ 9 - 111*	*320380 2/ 15:/ 4*	*320380 2/ 3/ :/ 2*	*1*

Lab Sample ID: LCS 410-342372/2-A
Matrix: Water
Analysis Batch: 342434

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 342372

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1-Methylnaphthalene	1.00	0.776		ug/L		78	41 - 115
2-Methylnaphthalene	1.00	0.738		ug/L		74	39 - 114
Acenaphthene	1.00	0.946		ug/L		95	48 - 114
Acenaphthylene	1.00	0.949		ug/L		95	35 - 121
Anthracene	1.00	1.00		ug/L		100	53 - 119
Benzo[a]anthracene	1.00	0.975		ug/L		97	59 - 120
Benzo[a]pyrene	1.00	0.997		ug/L		100	53 - 120
Benzo[b]fluoranthene	1.00	1.00		ug/L		100	53 - 126
Benzo[g,h,i]perylene	1.00	0.682		ug/L		68	44 - 128
Benzo[k]fluoranthene	1.00	1.09		ug/L		109	54 - 125
Chrysene	1.00	0.907		ug/L		91	57 - 120
Dibenz(a,h)anthracene	1.00	0.632		ug/L		63	44 - 131
Fluoranthene	1.00	0.948		ug/L		95	58 - 120
Fluorene	1.00	0.913		ug/L		91	50 - 118
Indeno[1,2,3-cd]pyrene	1.00	0.705	M	ug/L		70	48 - 130
Naphthalene	1.00	0.887		ug/L		89	43 - 114
Phenanthrene	1.00	0.982		ug/L		98	53 - 115
Pyrene	1.00	0.900		ug/L		90	53 - 121

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Benzo(a)pyrene-d12 (Surr)	*79*		*13 - 113*
Fluoranthene-d13 (Surr)	*75*		*48 - 12M*
1-6 ethylnaphthalene-d13 (Surr)	*M4*		*/ 9 - 111*

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Lab Sample ID: LCSD 410-342372/3-A
Matrix: Water
Analysis Batch: 342434

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 342372

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
1-Methylnaphthalene			1.00	0.794		ug/L		79	41 - 115	2	20
2-Methylnaphthalene			1.00	0.741		ug/L		74	39 - 114	0	20
Acenaphthene			1.00	0.987		ug/L		99	48 - 114	4	20
Acenaphthylene			1.00	0.972		ug/L		97	35 - 121	2	20
Anthracene			1.00	1.01		ug/L		101	53 - 119	1	20
Benzo[a]anthracene			1.00	0.982		ug/L		98	59 - 120	1	20
Benzo[a]pyrene			1.00	1.02		ug/L		102	53 - 120	3	20
Benzo[b]fluoranthene			1.00	1.03		ug/L		103	53 - 126	3	20
Benzo[g,h,i]perylene			1.00	0.721		ug/L		72	44 - 128	6	20
Benzo[k]fluoranthene			1.00	1.12		ug/L		112	54 - 125	2	20
Chrysene			1.00	0.930		ug/L		93	57 - 120	3	20
Dibenz(a,h)anthracene			1.00	0.668		ug/L		67	44 - 131	6	20
Fluoranthene			1.00	0.968		ug/L		97	58 - 120	2	20
Fluorene			1.00	0.930		ug/L		93	50 - 118	2	20
Indeno[1,2,3-cd]pyrene			1.00	0.725	M	ug/L		72	48 - 130	3	20
Naphthalene			1.00	0.926		ug/L		93	43 - 114	4	20
Phenanthrene			1.00	0.989		ug/L		99	53 - 115	1	20
Pyrene			1.00	0.921		ug/L		92	53 - 121	2	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Benzo(a)pyrene-d12 (Surr)	*77*		*13 - 113*
Fluoranthene-d13 (Surr)	*7M*		*48 - 12M*
1-6 ethylnaphthalene-d13 (Surr)	*MM*		*/ 9 - 111*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Lab Sample ID: MB 410-340603/5
Matrix: Water
Analysis Batch: 340603

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
C7-C12 (1C)	85	U M	250	85	43	ug/L		02/01/23 17:24	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*77*		*53 - 153*		*320302/ 18:24*	*1*

Lab Sample ID: LCS 410-340603/6
Matrix: Water
Analysis Batch: 340603

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
C7-C12 (1C)			1100	1030	M	ug/L		94	64 - 131		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid) (1C)	*M*		*53 - 153*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC) (Continued)

Lab Sample ID: LCSD 410-340603/7
Matrix: Water
Analysis Batch: 340603

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
C7-C12 (1C)			1100	1040	M	ug/L		94	64 - 131	1	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid) (1C)	*M*		*53 - 153*

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Lab Sample ID: MB 410-342006/1-A
Matrix: Water
Analysis Batch: 342238

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 342006

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
PCB-1016 (1C)	0.20	U	0.25	0.20	0.10	ug/L		02/07/23 08:16	1
PCB-1221 (1C)	0.20	U	0.25	0.20	0.10	ug/L		02/07/23 08:16	1
PCB-1232 (1C)	0.20	U	0.25	0.20	0.10	ug/L		02/07/23 08:16	1
PCB-1242 (1C)	0.20	U	0.25	0.20	0.10	ug/L		02/07/23 08:16	1
PCB-1248 (1C)	0.20	U	0.25	0.20	0.10	ug/L		02/07/23 08:16	1
PCB-1254 (1C)	0.20	U	0.25	0.20	0.078	ug/L		02/07/23 08:16	1
PCB-1260 (1C)	0.20	U	0.25	0.20	0.078	ug/L		02/07/23 08:16	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl (Surr) (1C)	*97*		*13 - 14M*	*320390 02/ 15:/ 5*	*320380 02/ 3M19*	*1*
DCB Decachlorobiphenyl (Surr) (2C)	*97*		*13 - 14M*	*320390 02/ 15:/ 5*	*320380 02/ 3M19*	*1*
Tetrachloro-x -Qylene (1C)	*23*	*m*	*/ / - 1/ 8*	*320390 02/ 15:/ 5*	*320380 02/ 3M19*	*1*
Tetrachloro-x -Qylene (2C)	*2/*	*m*	*/ / - 1/ 8*	*320390 02/ 15:/ 5*	*320380 02/ 3M19*	*1*

Lab Sample ID: LCS 410-342006/2-A
Matrix: Water
Analysis Batch: 342238

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 342006

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
PCB-1016 (1C)			5.01	4.32		ug/L		86	46 - 129
PCB-1260 (1C)			5.02	3.97		ug/L		79	45 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
DCB Decachlorobiphenyl (Surr) (1C)	*89*		*13 - 14M*
DCB Decachlorobiphenyl (Surr) (2C)	*84*		*13 - 14M*
Tetrachloro-x -Qylene (1C)	*45*		*/ / - 1/ 8*
Tetrachloro-x -Qylene (2C)	*47*		*/ / - 1/ 8*

Lab Sample ID: LCSD 410-342006/3-A
Matrix: Water
Analysis Batch: 342238

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 342006

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
PCB-1016 (1C)			5.01	4.00		ug/L		80	46 - 129	8	30

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography (Continued)

Lab Sample ID: LCSD 410-342006/3-A
Matrix: Water
Analysis Batch: 342238

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 342006

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
PCB-1260 (1C)			5.02	2.53	Q	ug/L		50	45 - 134	44	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
DCB Decachlorobiphenyl (Surr) (1C)	*/ 7*		*13 - 14M*
DCB Decachlorobiphenyl (Surr) (2C)	*43*		*13 - 14M*
Tetrachloro-x -Qylene (1C)	*28*	*m*	*/ / - 1/ 8*
Tetrachloro-x -Qylene (2C)	*/ 2*	*m*	*/ / - 1/ 8*

Lab Sample ID: MB 410-347500/1-A
Matrix: Water
Analysis Batch: 347667

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 347500

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
PCB-1016 (1C)	0.20	U	0.25	0.20	0.10	ug/L		02/24/23 08:20	1
PCB-1221 (1C)	0.20	U	0.25	0.20	0.10	ug/L		02/24/23 08:20	1
PCB-1232 (1C)	0.20	U	0.25	0.20	0.10	ug/L		02/24/23 08:20	1
PCB-1242 (1C)	0.20	U	0.25	0.20	0.10	ug/L		02/24/23 08:20	1
PCB-1248 (1C)	0.20	U	0.25	0.20	0.10	ug/L		02/24/23 08:20	1
PCB-1254 (1C)	0.20	U	0.25	0.20	0.078	ug/L		02/24/23 08:20	1
PCB-1260 (1C)	0.20	U M	0.25	0.20	0.078	ug/L		02/24/23 08:20	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl (Surr) (1C)	*5/*		*13 - 14M*	*3202/ 02/ 19:59*	*3202402/ 3M23*	*1*
DCB Decachlorobiphenyl (Surr) (2C)	*9/*		*13 - 14M*	*3202/ 02/ 19:59*	*3202402/ 3M23*	*1*
Tetrachloro-x -Qylene (1C)	*45*		*/ / - 1/ 8*	*3202/ 02/ 19:59*	*3202402/ 3M23*	*1*
Tetrachloro-x -Qylene (2C)	*57*		*/ / - 1/ 8*	*3202/ 02/ 19:59*	*3202402/ 3M23*	*1*

Lab Sample ID: LCS 410-347500/2-A
Matrix: Water
Analysis Batch: 347667

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 347500

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
PCB-1016 (1C)			5.01	3.44		ug/L		69	46 - 129
PCB-1260 (1C)			5.02	2.56		ug/L		51	45 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
DCB Decachlorobiphenyl (Surr) (1C)	*/ 2*		*13 - 14M*
DCB Decachlorobiphenyl (Surr) (2C)	*/ M*		*13 - 14M*
Tetrachloro-x -Qylene (1C)	*49*		*/ / - 1/ 8*
Tetrachloro-x -Qylene (2C)	*91*		*/ / - 1/ 8*

QC Sample Results

Client: Jacobs Engineering Group, Inc.
Project/Site: CTO-4117 NBK Keyport

Job ID: 410-113811-1
SDG: NBK Keyport

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Lab Sample ID: MB 410-342797/1-A
Matrix: Water
Analysis Batch: 342917

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 342797

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
C12-C24	90	U M	100	90	45	ug/L		02/09/23 04:22	1
C24-C40	240	U M	250	240	100	ug/L		02/09/23 04:22	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o- terphenyl (Surr)	*M1*		*53 - 153*	*3203M02/ 15:/ M*	*3203702/ 34:22*	*1*

Lab Sample ID: LCS 410-342797/2-A
Matrix: Water
Analysis Batch: 342917

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 342797

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
C12-C24	604	245		ug/L		41	14 - 115

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
o- terphenyl (Surr)	*88*		*53 - 153*

Lab Sample ID: LCSD 410-342797/3-A
Matrix: Water
Analysis Batch: 342917

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 342797

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
C12-C24	604	284		ug/L		47	14 - 115	14	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
o- terphenyl (Surr)	*M/*		*53 - 153*

Lab Sample ID: 410-113811-3 DU
Matrix: Water
Analysis Batch: 342917

Client Sample ID: NBKK-IDW13-AQ-012523
Prep Type: Total/NA
Prep Batch: 342797

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
C12-C24	96	U M	96	U M	ug/L		NC	20
C24-C40	260	U M	260	U M	ug/L		NC	20

Surrogate	*DU %Recovery*	*DU Qualifier*	*Limits*
o- terphenyl (Surr)	*83*		*53 - 153*

Lab Sample ID: 410-113811-9 DU
Matrix: Water
Analysis Batch: 342917

Client Sample ID: NBKK-IDW19-AQ-012523
Prep Type: Total/NA
Prep Batch: 342797

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
C12-C24	130	M	132	M	ug/L		5	20
C24-C40	270	U M	280	U M	ug/L		NC	20

Surrogate	*DU %Recovery*	*DU Qualifier*	*Limits*
o- terphenyl (Surr)	*87*		*53 - 153*

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 410-340849/1-A
Matrix: Water
Analysis Batch: 341439

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 340849

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	0.0017	U	0.0020	0.0017	0.00068	mg/L		02/03/23 10:16	1
Cadmium	0.00040	U	0.00050	0.00040	0.00015	mg/L		02/03/23 10:16	1
Chromium	0.00080	U	0.0020	0.00080	0.00033	mg/L		02/03/23 10:16	1
Copper	0.00090	U	0.0010	0.00090	0.00036	mg/L		02/03/23 10:16	1
Lead	0.00020	U	0.00050	0.00020	0.000071	mg/L		02/03/23 10:16	1
Nickel	0.00080	U	0.0015	0.00080	0.00040	mg/L		02/03/23 10:16	1
Selenium	0.00060	U	0.0010	0.00060	0.00028	mg/L		02/03/23 10:16	1
Silver	0.00030	U	0.00050	0.00030	0.00010	mg/L		02/03/23 10:16	1
Zinc	0.00482	J	0.015	0.0080	0.0040	mg/L		02/03/23 10:16	1

Lab Sample ID: LCS 410-340849/2-A
Matrix: Water
Analysis Batch: 341439

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 340849

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	0.500	0.505		mg/L		101	84 - 116
Barium	0.500	0.536		mg/L		107	86 - 114
Cadmium	0.0500	0.0530		mg/L		106	87 - 115
Chromium	0.500	0.527		mg/L		105	85 - 116
Copper	0.500	0.535		mg/L		107	85 - 118
Lead	0.0500	0.0530		mg/L		106	88 - 115
Nickel	0.500	0.537		mg/L		107	85 - 117
Selenium	0.100	0.103		mg/L		103	80 - 120
Silver	0.0500	0.0537		mg/L		107	85 - 116
Zinc	0.500	0.533		mg/L		107	83 - 119

Lab Sample ID: MB 410-341434/1-A
Matrix: Water
Analysis Batch: 342715

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 341434

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	0.0017	U	0.0020	0.0017	0.00068	mg/L		02/08/23 08:15	1
Barium	0.0016	U	0.0020	0.0016	0.00075	mg/L		02/08/23 08:15	1
Cadmium	0.00040	U	0.00050	0.00040	0.00015	mg/L		02/08/23 08:15	1
Chromium	0.00080	U	0.0020	0.00080	0.00033	mg/L		02/08/23 08:15	1
Copper	0.00090	U	0.0010	0.00090	0.00036	mg/L		02/08/23 08:15	1
Lead	0.00020	U	0.00050	0.00020	0.000071	mg/L		02/08/23 08:15	1
Nickel	0.00080	U	0.0015	0.00080	0.00040	mg/L		02/08/23 08:15	1
Selenium	0.00060	U	0.0010	0.00060	0.00028	mg/L		02/08/23 08:15	1
Silver	0.00030	U	0.00050	0.00030	0.00010	mg/L		02/08/23 08:15	1
Zinc	0.0080	U	0.015	0.0080	0.0040	mg/L		02/08/23 08:15	1

Lab Sample ID: LCS 410-341434/2-A
Matrix: Water
Analysis Batch: 342715

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 341434

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	0.500	0.506		mg/L		101	84 - 116
Barium	0.500	0.529		mg/L		106	86 - 114

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 410-341434/2-A
Matrix: Water
Analysis Batch: 342715

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 341434

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Cadmium	0.0500	0.0537		mg/L		107	87 - 115
Chromium	0.500	0.529		mg/L		106	85 - 116
Copper	0.500	0.528		mg/L		106	85 - 118
Lead	0.0500	0.0520		mg/L		104	88 - 115
Nickel	0.500	0.531		mg/L		106	85 - 117
Selenium	0.100	0.101		mg/L		101	80 - 120
Silver	0.0500	0.0544		mg/L		109	85 - 116
Zinc	0.500	0.530		mg/L		106	83 - 119

Lab Sample ID: MB 410-342136/1-A
Matrix: Water
Analysis Batch: 342493

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 342136

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Barium	0.0016	U	0.0020	0.0016	0.00075	mg/L		02/07/23 19:51	1

Lab Sample ID: LCS 410-342136/2-A
Matrix: Water
Analysis Batch: 342493

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 342136

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Barium	0.500	0.519		mg/L		104	86 - 114

Lab Sample ID: 410-113811-2 MS
Matrix: Water
Analysis Batch: 342493

Client Sample ID: NBKK-IDW12-AQ-012523
Prep Type: Total Recoverable
Prep Batch: 342136

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Barium	0.0024		0.500	0.538		mg/L		107	86 - 114

Lab Sample ID: 410-113811-2 MSD
Matrix: Water
Analysis Batch: 342493

Client Sample ID: NBKK-IDW12-AQ-012523
Prep Type: Total Recoverable
Prep Batch: 342136

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Barium	0.0024		0.500	0.521		mg/L		104	86 - 114	3	20

Lab Sample ID: 410-113811-2 DU
Matrix: Water
Analysis Batch: 342493

Client Sample ID: NBKK-IDW12-AQ-012523
Prep Type: Total Recoverable
Prep Batch: 342136

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Barium	0.0024		0.00238		mg/L		1	20

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 410-340385/1-A
Matrix: Water
Analysis Batch: 340588

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 340385

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	0.16	U	0.20	0.16	0.079	ug/L		02/01/23 12:55	1

Lab Sample ID: LCS 410-340385/2-A
Matrix: Water
Analysis Batch: 340588

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 340385

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	1.00	0.928		ug/L		93	82 - 119

Lab Sample ID: MB 410-340937/1-A
Matrix: Water
Analysis Batch: 341529

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 340937

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	0.16	U	0.20	0.16	0.079	ug/L		02/03/23 15:29	1

Lab Sample ID: LCS 410-340937/2-A
Matrix: Water
Analysis Batch: 341529

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 340937

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	1.00	0.919		ug/L		92	82 - 119

Method: 1010 - Ignitability, Pensky-Martens Closed-Cup Method

Lab Sample ID: LCS 410-342751/1
Matrix: Water
Analysis Batch: 342751

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Flashpoint	81.0	81.00		Degrees F		100	96.9 - 103.1

Lab Sample ID: LCSD 410-342751/2
Matrix: Water
Analysis Batch: 342751

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Flashpoint	81.0	79.00		Degrees F		98	96.9 - 103.1	3	4

Lab Sample ID: LCS 410-346321/1
Matrix: Water
Analysis Batch: 346321

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Flashpoint	81.0	81.00		Degrees F		100	96.9 - 103.1

Method: 1010 - Ignitability, Pensky-Martens Closed-Cup Method (Continued)

Lab Sample ID: LCSD 410-346321/2
Matrix: Water
Analysis Batch: 346321

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Flashpoint			81.0	80.00		Degrees F		99	96.9 - 103.1	1	4

Method: 9012 - Cyanide, Reactive

Lab Sample ID: MB 410-342591/1-A
Matrix: Water
Analysis Batch: 343093

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 342591

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Cyanide, Reactive	50	U	60	50	20	mg/Kg		02/09/23 09:43	1

Lab Sample ID: MB 410-342591/1-A
Matrix: Water
Analysis Batch: 343093

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 342591

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Cyanide, Reactive	50	U	60	50	20	mg/Kg		02/09/23 10:24	1

Lab Sample ID: LCS 410-342591/2-A
Matrix: Water
Analysis Batch: 343093

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 342591

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Cyanide, Reactive			1000	500	U	mg/Kg		3	0 - 5.14		

Lab Sample ID: MB 410-346080/1-A
Matrix: Water
Analysis Batch: 346220

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 346080

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Cyanide, Reactive	50	U	60	50	20	mg/Kg		02/20/23 16:09	1

Lab Sample ID: LCS 410-346080/2-A
Matrix: Water
Analysis Batch: 346220

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 346080

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Cyanide, Reactive			1000	500	U	mg/Kg		2	0 - 5.14		

Method: 9034 - Sulfide, Reactive

Lab Sample ID: MB 410-342591/1-A
Matrix: Water
Analysis Batch: 342698

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 342591

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Sulfide, Reactive	140	U	160	140	54	mg/Kg		02/08/23 11:57	1

Method: 9034 - Sulfide, Reactive (Continued)

Lab Sample ID: LCS 410-342591/25-A
Matrix: Water
Analysis Batch: 342698

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 342591

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfide, Reactive	538	477		mg/Kg		89	56 - 104

Lab Sample ID: MB 410-346080/1-A
Matrix: Water
Analysis Batch: 346154

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 346080

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Sulfide, Reactive	140	U	160	140	54	mg/Kg		02/20/23 13:15	1

Lab Sample ID: LCS 410-346080/25-A
Matrix: Water
Analysis Batch: 346154

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 346080

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfide, Reactive	539	399		mg/Kg		74	56 - 104

Method: 9040C - pH

Lab Sample ID: LCS 410-340261/1
Matrix: Water
Analysis Batch: 340261

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
pH	7.00	7.0		S.U.		100	95 - 105

Lab Sample ID: 410-113811-6 DU
Matrix: Water
Analysis Batch: 340261

Client Sample ID: NBKK-IDW16-AQ-012523
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH	7.5	HF	7.5		S.U.		0.1	4

Lab Sample ID: 410-113811-10 DU
Matrix: Water
Analysis Batch: 340261

Client Sample ID: NBKK-IDW20-AQ-012523
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH	7.5	HF	7.5		S.U.		0	4

GC/MS SVmi OL A

erVh Batc: 3216871

bap SamhIV ID	CliVnt SamhIV ID	erVh PyhV	MatriT	MVt: ox	erVh Batc:
410-113811-1	NBKK-IDW11-AQ-012523	Total/NA	Water	3510C	
410-113811-2	NBKK-IDW12-AQ-012523	Total/NA	Water	3510C	
410-113811-3	NBKK-IDW13-AQ-012523	Total/NA	Water	3510C	
410-113811-4	NBKK-IDW14-AQ-012523	Total/NA	Water	3510C	
410-113811-5	NBKK-IDW15-AQ-012523	Total/NA	Water	3510C	
410-113811-6	NBKK-IDW16-AQ-012523	Total/NA	Water	3510C	
410-113811-7	NBKK-IDW17-AQ-012523	Total/NA	Water	3510C	
410-113811-8	NBKK-IDW18-AQ-012523	Total/NA	Water	3510C	
410-113811-9	NBKK-IDW19-AQ-012523	Total/NA	Water	3510C	
410-113811-10	NBKK-IDW20-AQ-012523	Total/NA	Water	3510C	
MB 410-340624/1-A	Method Blank	Total/NA	Water	3510C	
LCS 410-340624/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 410-340624/3-A	Lab Control Sample Dup	Total/NA	Water	3510C	

Analysis Batc: 3216d46

bap SamhIV ID	CliVnt SamhIV ID	erVh PyhV	MatriT	MVt: ox	erVh Batc:
410-113811-1	NBKK-IDW11-AQ-012523	Total/NA	Water	8270E SIM	340624
410-113811-2	NBKK-IDW12-AQ-012523	Total/NA	Water	8270E SIM	340624
MB 410-340624/1-A	Method Blank	Total/NA	Water	8270E SIM	340624
LCS 410-340624/2-A	Lab Control Sample	Total/NA	Water	8270E SIM	340624
LCSD 410-340624/3-A	Lab Control Sample Dup	Total/NA	Water	8270E SIM	340624

Analysis Batc: 3215511

bap SamhIV ID	CliVnt SamhIV ID	erVh PyhV	MatriT	MVt: ox	erVh Batc:
410-113811-3	NBKK-IDW13-AQ-012523	Total/NA	Water	8270E SIM	340624
410-113811-4	NBKK-IDW14-AQ-012523	Total/NA	Water	8270E SIM	340624
410-113811-5	NBKK-IDW15-AQ-012523	Total/NA	Water	8270E SIM	340624
410-113811-6	NBKK-IDW16-AQ-012523	Total/NA	Water	8270E SIM	340624
410-113811-7	NBKK-IDW17-AQ-012523	Total/NA	Water	8270E SIM	340624
410-113811-8	NBKK-IDW18-AQ-012523	Total/NA	Water	8270E SIM	340624
410-113811-9	NBKK-IDW19-AQ-012523	Total/NA	Water	8270E SIM	340624
410-113811-10	NBKK-IDW20-AQ-012523	Total/NA	Water	8270E SIM	340624

erVh Batc: 32172d7

bap SamhIV ID	CliVnt SamhIV ID	erVh PyhV	MatriT	MVt: ox	erVh Batc:
410-113811-6 - RE	NBKK-IDW16-AQ-012523	Total/NA	Water	3510C	
MB 410-342372/1-A	Method Blank	Total/NA	Water	3510C	
LCS 410-342372/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 410-342372/3-A	Lab Control Sample Dup	Total/NA	Water	3510C	

Analysis Batc: 3217121

bap SamhIV ID	CliVnt SamhIV ID	erVh PyhV	MatriT	MVt: ox	erVh Batc:
410-113811-6 - RE	NBKK-IDW16-AQ-012523	Total/NA	Water	8270E SIM	342372
MB 410-342372/1-A	Method Blank	Total/NA	Water	8270E SIM	342372
LCS 410-342372/2-A	Lab Control Sample	Total/NA	Water	8270E SIM	342372
LCSD 410-342372/3-A	Lab Control Sample Dup	Total/NA	Water	8270E SIM	342372

GC OL A

Analysis Batc: 3216862

bap SamhIV ID	CliVnt SamhIV ID	erVh PyhV	MatriT	MVt: ox	erVh Batc:
410-113811-1	NBKK-IDW11-AQ-012523	Total/NA	Water	NWTPH-Gx	
410-113811-2	NBKK-IDW12-AQ-012523	Total/NA	Water	NWTPH-Gx	
410-113811-3	NBKK-IDW13-AQ-012523	Total/NA	Water	NWTPH-Gx	
410-113811-4	NBKK-IDW14-AQ-012523	Total/NA	Water	NWTPH-Gx	
410-113811-5	NBKK-IDW15-AQ-012523	Total/NA	Water	NWTPH-Gx	
410-113811-6	NBKK-IDW16-AQ-012523	Total/NA	Water	NWTPH-Gx	
410-113811-7	NBKK-IDW17-AQ-012523	Total/NA	Water	NWTPH-Gx	
410-113811-8	NBKK-IDW18-AQ-012523	Total/NA	Water	NWTPH-Gx	
410-113811-9	NBKK-IDW19-AQ-012523	Total/NA	Water	NWTPH-Gx	
410-113811-10	NBKK-IDW20-AQ-012523	Total/NA	Water	NWTPH-Gx	
MB 410-340603/5	Method Blank	Total/NA	Water	NWTPH-Gx	
LCS 410-340603/6	Lab Control Sample	Total/NA	Water	NWTPH-Gx	
LCSD 410-340603/7	Lab Control Sample Dup	Total/NA	Water	NWTPH-Gx	

GC SVmi OL A

erVh Batc: 3217668

bap SamhIV ID	CliVnt SamhIV ID	erVh PyhV	MatriT	MVt: ox	erVh Batc:
410-113811-1	NBKK-IDW11-AQ-012523	Total/NA	Water	3510C	
410-113811-2	NBKK-IDW12-AQ-012523	Total/NA	Water	3510C	
410-113811-3	NBKK-IDW13-AQ-012523	Total/NA	Water	3510C	
410-113811-4	NBKK-IDW14-AQ-012523	Total/NA	Water	3510C	
410-113811-5	NBKK-IDW15-AQ-012523	Total/NA	Water	3510C	
410-113811-6	NBKK-IDW16-AQ-012523	Total/NA	Water	3510C	
410-113811-7	NBKK-IDW17-AQ-012523	Total/NA	Water	3510C	
410-113811-8	NBKK-IDW18-AQ-012523	Total/NA	Water	3510C	
410-113811-10	NBKK-IDW20-AQ-012523	Total/NA	Water	3510C	
MB 410-342006/1-A	Method Blank	Total/NA	Water	3510C	
LCS 410-342006/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 410-342006/3-A	Lab Control Sample Dup	Total/NA	Water	3510C	

Analysis Batc: 3217729

bap SamhIV ID	CliVnt SamhIV ID	erVh PyhV	MatriT	MVt: ox	erVh Batc:
410-113811-1	NBKK-IDW11-AQ-012523	Total/NA	Water	8082A	342006
410-113811-2	NBKK-IDW12-AQ-012523	Total/NA	Water	8082A	342006
410-113811-3	NBKK-IDW13-AQ-012523	Total/NA	Water	8082A	342006
410-113811-4	NBKK-IDW14-AQ-012523	Total/NA	Water	8082A	342006
410-113811-5	NBKK-IDW15-AQ-012523	Total/NA	Water	8082A	342006
410-113811-6	NBKK-IDW16-AQ-012523	Total/NA	Water	8082A	342006
410-113811-7	NBKK-IDW17-AQ-012523	Total/NA	Water	8082A	342006
410-113811-8	NBKK-IDW18-AQ-012523	Total/NA	Water	8082A	342006
410-113811-10	NBKK-IDW20-AQ-012523	Total/NA	Water	8082A	342006
MB 410-342006/1-A	Method Blank	Total/NA	Water	8082A	342006
LCS 410-342006/2-A	Lab Control Sample	Total/NA	Water	8082A	342006
LCSD 410-342006/3-A	Lab Control Sample Dup	Total/NA	Water	8082A	342006

erVh Batc: 3217d4d

bap SamhIV ID	CliVnt SamhIV ID	erVh PyhV	MatriT	MVt: ox	erVh Batc:
410-113811-1	NBKK-IDW11-AQ-012523	Total/NA	Water	3510C	
410-113811-2	NBKK-IDW12-AQ-012523	Total/NA	Water	3510C	
410-113811-3	NBKK-IDW13-AQ-012523	Total/NA	Water	3510C	

GC SVmi OL A (ContinuVx)

erVh Batc: 3217d4d (ContinuVx)

bap SamhIV ID	CliVnt SamhIV ID	erVh PyhV	MatriT	MVt: ox	erVh Batc:
410-113811-4	NBKK-IDW14-AQ-012523	Total/NA	Water	3510C	
410-113811-5	NBKK-IDW15-AQ-012523	Total/NA	Water	3510C	
410-113811-6	NBKK-IDW16-AQ-012523	Total/NA	Water	3510C	
410-113811-7	NBKK-IDW17-AQ-012523	Total/NA	Water	3510C	
410-113811-8	NBKK-IDW18-AQ-012523	Total/NA	Water	3510C	
410-113811-9	NBKK-IDW19-AQ-012523	Total/NA	Water	3510C	
410-113811-10	NBKK-IDW20-AQ-012523	Total/NA	Water	3510C	
MB 410-342797/1-A	Method Blank	Total/NA	Water	3510C	
LCS 410-342797/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 410-342797/3-A	Lab Control Sample Dup	Total/NA	Water	3510C	
410-113811-3 DU	NBKK-IDW13-AQ-012523	Total/NA	Water	3510C	
410-113811-9 DU	NBKK-IDW19-AQ-012523	Total/NA	Water	3510C	

Analysis Batc: 321745d

bap SamhIV ID	CliVnt SamhIV ID	erVh PyhV	MatriT	MVt: ox	erVh Batc:
410-113811-1	NBKK-IDW11-AQ-012523	Total/NA	Water	NWTPH-Dx	342797
410-113811-2	NBKK-IDW12-AQ-012523	Total/NA	Water	NWTPH-Dx	342797
410-113811-3	NBKK-IDW13-AQ-012523	Total/NA	Water	NWTPH-Dx	342797
410-113811-4	NBKK-IDW14-AQ-012523	Total/NA	Water	NWTPH-Dx	342797
410-113811-5	NBKK-IDW15-AQ-012523	Total/NA	Water	NWTPH-Dx	342797
410-113811-6	NBKK-IDW16-AQ-012523	Total/NA	Water	NWTPH-Dx	342797
410-113811-7	NBKK-IDW17-AQ-012523	Total/NA	Water	NWTPH-Dx	342797
410-113811-8	NBKK-IDW18-AQ-012523	Total/NA	Water	NWTPH-Dx	342797
410-113811-9	NBKK-IDW19-AQ-012523	Total/NA	Water	NWTPH-Dx	342797
410-113811-10	NBKK-IDW20-AQ-012523	Total/NA	Water	NWTPH-Dx	342797
MB 410-342797/1-A	Method Blank	Total/NA	Water	NWTPH-Dx	342797
LCS 410-342797/2-A	Lab Control Sample	Total/NA	Water	NWTPH-Dx	342797
LCSD 410-342797/3-A	Lab Control Sample Dup	Total/NA	Water	NWTPH-Dx	342797
410-113811-3 DU	NBKK-IDW13-AQ-012523	Total/NA	Water	NWTPH-Dx	342797
410-113811-9 DU	NBKK-IDW19-AQ-012523	Total/NA	Water	NWTPH-Dx	342797

erVh Batc: 321d066

bap SamhIV ID	CliVnt SamhIV ID	erVh PyhV	MatriT	MVt: ox	erVh Batc:
410-113811-9	NBKK-IDW19-AQ-012523	Total/NA	Water	3510C	
MB 410-347500/1-A	Method Blank	Total/NA	Water	3510C	
LCS 410-347500/2-A	Lab Control Sample	Total/NA	Water	3510C	

Analysis Batc: 321d88d

bap SamhIV ID	CliVnt SamhIV ID	erVh PyhV	MatriT	MVt: ox	erVh Batc:
410-113811-9	NBKK-IDW19-AQ-012523	Total/NA	Water	8082A	347500
MB 410-347500/1-A	Method Blank	Total/NA	Water	8082A	347500
LCS 410-347500/2-A	Lab Control Sample	Total/NA	Water	8082A	347500

MVtals

erVh Batc: 3216290

bap SamhIV ID	CliVnt SamhIV ID	erVh PyhV	MatriT	MVt: ox	erVh Batc:
410-113811-2	NBKK-IDW12-AQ-012523	Total/NA	Water	7470A	
410-113811-3	NBKK-IDW13-AQ-012523	Total/NA	Water	7470A	
410-113811-4	NBKK-IDW14-AQ-012523	Total/NA	Water	7470A	
410-113811-5	NBKK-IDW15-AQ-012523	Total/NA	Water	7470A	

MVtals (ContinuVx)

erVh Batc: 3216290 (ContinuVx)

bap SamhIV ID	CliVnt SamhIV ID	erVh PyhV	MatriT	MVt: ox	erVh Batc:
410-113811-6	NBKK-IDW16-AQ-012523	Total/NA	Water	7470A	
410-113811-7	NBKK-IDW17-AQ-012523	Total/NA	Water	7470A	
410-113811-8	NBKK-IDW18-AQ-012523	Total/NA	Water	7470A	
410-113811-9	NBKK-IDW19-AQ-012523	Total/NA	Water	7470A	
410-113811-10	NBKK-IDW20-AQ-012523	Total/NA	Water	7470A	
MB 410-340385/1-A	Method Blank	Total/NA	Water	7470A	
LCS 410-340385/2-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batc: 3216099

bap SamhIV ID	CliVnt SamhIV ID	erVh PyhV	MatriT	MVt: ox	erVh Batc:
410-113811-2	NBKK-IDW12-AQ-012523	Total/NA	Water	7470A	340385
410-113811-3	NBKK-IDW13-AQ-012523	Total/NA	Water	7470A	340385
410-113811-4	NBKK-IDW14-AQ-012523	Total/NA	Water	7470A	340385
410-113811-5	NBKK-IDW15-AQ-012523	Total/NA	Water	7470A	340385
410-113811-6	NBKK-IDW16-AQ-012523	Total/NA	Water	7470A	340385
410-113811-7	NBKK-IDW17-AQ-012523	Total/NA	Water	7470A	340385
410-113811-8	NBKK-IDW18-AQ-012523	Total/NA	Water	7470A	340385
410-113811-9	NBKK-IDW19-AQ-012523	Total/NA	Water	7470A	340385
410-113811-10	NBKK-IDW20-AQ-012523	Total/NA	Water	7470A	340385
MB 410-340385/1-A	Method Blank	Total/NA	Water	7470A	340385
LCS 410-340385/2-A	Lab Control Sample	Total/NA	Water	7470A	340385

erVh Batc: 3216914

bap SamhIV ID	CliVnt SamhIV ID	erVh PyhV	MatriT	MVt: ox	erVh Batc:
410-113811-1	NBKK-IDW11-AQ-012523	Total Recoverable	Water	3005A	
410-113811-2	NBKK-IDW12-AQ-012523	Total Recoverable	Water	3005A	
410-113811-4	NBKK-IDW14-AQ-012523	Total Recoverable	Water	3005A	
410-113811-5	NBKK-IDW15-AQ-012523	Total Recoverable	Water	3005A	
410-113811-6	NBKK-IDW16-AQ-012523	Total Recoverable	Water	3005A	
410-113811-8	NBKK-IDW18-AQ-012523	Total Recoverable	Water	3005A	
410-113811-9	NBKK-IDW19-AQ-012523	Total Recoverable	Water	3005A	
410-113811-10	NBKK-IDW20-AQ-012523	Total Recoverable	Water	3005A	
MB 410-340849/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 410-340849/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

erVh Batc: 321642d

bap SamhIV ID	CliVnt SamhIV ID	erVh PyhV	MatriT	MVt: ox	erVh Batc:
410-113811-1	NBKK-IDW11-AQ-012523	Total/NA	Water	7470A	
MB 410-340937/1-A	Method Blank	Total/NA	Water	7470A	
LCS 410-340937/2-A	Lab Control Sample	Total/NA	Water	7470A	

erVh Batc: 3215121

bap SamhIV ID	CliVnt SamhIV ID	erVh PyhV	MatriT	MVt: ox	erVh Batc:
410-113811-3	NBKK-IDW13-AQ-012523	Total Recoverable	Water	3005A	
410-113811-7	NBKK-IDW17-AQ-012523	Total Recoverable	Water	3005A	
MB 410-341434/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 410-341434/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batc: 3215124

bap SamhIV ID	CliVnt SamhIV ID	erVh PyhV	MatriT	MVt: ox	erVh Batc:
410-113811-1	NBKK-IDW11-AQ-012523	Total Recoverable	Water	6020B	340849

MVtals (ContinuVx)

Analysis Batc: 3215124 (ContinuVx)

bap SamhIV ID	CliVnt SamhIV ID	erVh PyhV	MatriT	MVt: ox	erVh Batc:
410-113811-2	NBKK-IDW12-AQ-012523	Total Recoverable	Water	6020B	340849
410-113811-4	NBKK-IDW14-AQ-012523	Total Recoverable	Water	6020B	340849
410-113811-5	NBKK-IDW15-AQ-012523	Total Recoverable	Water	6020B	340849
410-113811-6	NBKK-IDW16-AQ-012523	Total Recoverable	Water	6020B	340849
410-113811-8	NBKK-IDW18-AQ-012523	Total Recoverable	Water	6020B	340849
410-113811-9	NBKK-IDW19-AQ-012523	Total Recoverable	Water	6020B	340849
410-113811-10	NBKK-IDW20-AQ-012523	Total Recoverable	Water	6020B	340849
MB 410-340849/1-A	Method Blank	Total Recoverable	Water	6020B	340849
LCS 410-340849/2-A	Lab Control Sample	Total Recoverable	Water	6020B	340849

Analysis Batc: 3215074

bap SamhIV ID	CliVnt SamhIV ID	erVh PyhV	MatriT	MVt: ox	erVh Batc:
410-113811-1	NBKK-IDW11-AQ-012523	Total/NA	Water	7470A	340937
MB 410-340937/1-A	Method Blank	Total/NA	Water	7470A	340937
LCS 410-340937/2-A	Lab Control Sample	Total/NA	Water	7470A	340937

erVh Batc: 3217528

bap SamhIV ID	CliVnt SamhIV ID	erVh PyhV	MatriT	MVt: ox	erVh Batc:
410-113811-1	NBKK-IDW11-AQ-012523	Total Recoverable	Water	3005A	
410-113811-2	NBKK-IDW12-AQ-012523	Total Recoverable	Water	3005A	
410-113811-4	NBKK-IDW14-AQ-012523	Total Recoverable	Water	3005A	
410-113811-5	NBKK-IDW15-AQ-012523	Total Recoverable	Water	3005A	
410-113811-8	NBKK-IDW18-AQ-012523	Total Recoverable	Water	3005A	
410-113811-9	NBKK-IDW19-AQ-012523	Total Recoverable	Water	3005A	
MB 410-342136/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 410-342136/2-A	Lab Control Sample	Total Recoverable	Water	3005A	
410-113811-2 MS	NBKK-IDW12-AQ-012523	Total Recoverable	Water	3005A	
410-113811-2 MSD	NBKK-IDW12-AQ-012523	Total Recoverable	Water	3005A	
410-113811-2 DU	NBKK-IDW12-AQ-012523	Total Recoverable	Water	3005A	

Analysis Batc: 3217142

bap SamhIV ID	CliVnt SamhIV ID	erVh PyhV	MatriT	MVt: ox	erVh Batc:
410-113811-1	NBKK-IDW11-AQ-012523	Total Recoverable	Water	6020B	342136
410-113811-2	NBKK-IDW12-AQ-012523	Total Recoverable	Water	6020B	342136
410-113811-4	NBKK-IDW14-AQ-012523	Total Recoverable	Water	6020B	342136
410-113811-5	NBKK-IDW15-AQ-012523	Total Recoverable	Water	6020B	342136
410-113811-8	NBKK-IDW18-AQ-012523	Total Recoverable	Water	6020B	342136
410-113811-9	NBKK-IDW19-AQ-012523	Total Recoverable	Water	6020B	342136
MB 410-342136/1-A	Method Blank	Total Recoverable	Water	6020B	342136
LCS 410-342136/2-A	Lab Control Sample	Total Recoverable	Water	6020B	342136
410-113811-2 MS	NBKK-IDW12-AQ-012523	Total Recoverable	Water	6020B	342136
410-113811-2 MSD	NBKK-IDW12-AQ-012523	Total Recoverable	Water	6020B	342136
410-113811-2 DU	NBKK-IDW12-AQ-012523	Total Recoverable	Water	6020B	342136

Analysis Batc: 3217d50

bap SamhIV ID	CliVnt SamhIV ID	erVh PyhV	MatriT	MVt: ox	erVh Batc:
410-113811-3	NBKK-IDW13-AQ-012523	Total Recoverable	Water	6020B	341434
410-113811-7	NBKK-IDW17-AQ-012523	Total Recoverable	Water	6020B	341434
MB 410-341434/1-A	Method Blank	Total Recoverable	Water	6020B	341434
LCS 410-341434/2-A	Lab Control Sample	Total Recoverable	Water	6020B	341434

GVnVral C: Vmistry

Analysis Batc: 3216785

bap SamhIV ID	CliVnt SamhIV ID	erVh PyhV	MatriT	MVt: ox	erVh Batc:
410-113811-1	NBKK-IDW11-AQ-012523	Total/NA	Water	9040C	
410-113811-2	NBKK-IDW12-AQ-012523	Total/NA	Water	9040C	
410-113811-3	NBKK-IDW13-AQ-012523	Total/NA	Water	9040C	
410-113811-4	NBKK-IDW14-AQ-012523	Total/NA	Water	9040C	
410-113811-5	NBKK-IDW15-AQ-012523	Total/NA	Water	9040C	
410-113811-6	NBKK-IDW16-AQ-012523	Total/NA	Water	9040C	
410-113811-7	NBKK-IDW17-AQ-012523	Total/NA	Water	9040C	
410-113811-8	NBKK-IDW18-AQ-012523	Total/NA	Water	9040C	
410-113811-9	NBKK-IDW19-AQ-012523	Total/NA	Water	9040C	
410-113811-10	NBKK-IDW20-AQ-012523	Total/NA	Water	9040C	
LCS 410-340261/1	Lab Control Sample	Total/NA	Water	9040C	
410-113811-6 DU	NBKK-IDW16-AQ-012523	Total/NA	Water	9040C	
410-113811-10 DU	NBKK-IDW20-AQ-012523	Total/NA	Water	9040C	

erVh Batc: 3217045

bap SamhIV ID	CliVnt SamhIV ID	erVh PyhV	MatriT	MVt: ox	erVh Batc:
410-113811-1	NBKK-IDW11-AQ-012523	Total/NA	Water	7.3.4	
410-113811-2	NBKK-IDW12-AQ-012523	Total/NA	Water	7.3.4	
410-113811-3	NBKK-IDW13-AQ-012523	Total/NA	Water	7.3.4	
410-113811-4	NBKK-IDW14-AQ-012523	Total/NA	Water	7.3.4	
410-113811-5	NBKK-IDW15-AQ-012523	Total/NA	Water	7.3.4	
MB 410-342591/1-A	Method Blank	Total/NA	Water	7.3.4	
LCS 410-342591/25-A	Lab Control Sample	Total/NA	Water	7.3.4	
LCS 410-342591/2-A	Lab Control Sample	Total/NA	Water	7.3.4	

Analysis Batc: 3217849

bap SamhIV ID	CliVnt SamhIV ID	erVh PyhV	MatriT	MVt: ox	erVh Batc:
410-113811-1	NBKK-IDW11-AQ-012523	Total/NA	Water	9034	342591
410-113811-2	NBKK-IDW12-AQ-012523	Total/NA	Water	9034	342591
410-113811-3	NBKK-IDW13-AQ-012523	Total/NA	Water	9034	342591
410-113811-4	NBKK-IDW14-AQ-012523	Total/NA	Water	9034	342591
410-113811-5	NBKK-IDW15-AQ-012523	Total/NA	Water	9034	342591
MB 410-342591/1-A	Method Blank	Total/NA	Water	9034	342591
LCS 410-342591/25-A	Lab Control Sample	Total/NA	Water	9034	342591

Analysis Batc: 3217d05

bap SamhIV ID	CliVnt SamhIV ID	erVh PyhV	MatriT	MVt: ox	erVh Batc:
410-113811-1	NBKK-IDW11-AQ-012523	Total/NA	Water	1010	
410-113811-2	NBKK-IDW12-AQ-012523	Total/NA	Water	1010	
410-113811-3	NBKK-IDW13-AQ-012523	Total/NA	Water	1010	
410-113811-4	NBKK-IDW14-AQ-012523	Total/NA	Water	1010	
410-113811-5	NBKK-IDW15-AQ-012523	Total/NA	Water	1010	
LCS 410-342751/1	Lab Control Sample	Total/NA	Water	1010	
LCSD 410-342751/2	Lab Control Sample Dup	Total/NA	Water	1010	

Analysis Batc: 3212642

bap SamhIV ID	CliVnt SamhIV ID	erVh PyhV	MatriT	MVt: ox	erVh Batc:
410-113811-1	NBKK-IDW11-AQ-012523	Total/NA	Water	9012	342591
410-113811-2	NBKK-IDW12-AQ-012523	Total/NA	Water	9012	342591
410-113811-3	NBKK-IDW13-AQ-012523	Total/NA	Water	9012	342591
410-113811-4	NBKK-IDW14-AQ-012523	Total/NA	Water	9012	342591

GVnVral C: Vmistry (ContinuVx)

Analysis Batc: 3212642 (ContinuVx)

bap SamhIV ID	CliVnt SamhIV ID	erVh PyhV	MatriT	MVt: ox	erVh Batc:
410-113811-5	NBKK-IDW15-AQ-012523	Total/NA	Water	9012	342591
MB 410-342591/1-A	Method Blank	Total/NA	Water	9012	342591
MB 410-342591/1-A	Method Blank	Total/NA	Water	9012	342591
LCS 410-342591/2-A	Lab Control Sample	Total/NA	Water	9012	342591

erVh Batc: 3218696

bap SamhIV ID	CliVnt SamhIV ID	erVh PyhV	MatriT	MVt: ox	erVh Batc:
410-113811-6	NBKK-IDW16-AQ-012523	Total/NA	Water	7.3.4	
410-113811-7	NBKK-IDW17-AQ-012523	Total/NA	Water	7.3.4	
410-113811-8	NBKK-IDW18-AQ-012523	Total/NA	Water	7.3.4	
410-113811-9	NBKK-IDW19-AQ-012523	Total/NA	Water	7.3.4	
410-113811-10	NBKK-IDW20-AQ-012523	Total/NA	Water	7.3.4	
MB 410-346080/1-A	Method Blank	Total/NA	Water	7.3.4	
LCS 410-346080/25-A	Lab Control Sample	Total/NA	Water	7.3.4	
LCS 410-346080/2-A	Lab Control Sample	Total/NA	Water	7.3.4	

Analysis Batc: 3218501

bap SamhIV ID	CliVnt SamhIV ID	erVh PyhV	MatriT	MVt: ox	erVh Batc:
410-113811-6	NBKK-IDW16-AQ-012523	Total/NA	Water	9034	346080
410-113811-7	NBKK-IDW17-AQ-012523	Total/NA	Water	9034	346080
410-113811-8	NBKK-IDW18-AQ-012523	Total/NA	Water	9034	346080
410-113811-9	NBKK-IDW19-AQ-012523	Total/NA	Water	9034	346080
410-113811-10	NBKK-IDW20-AQ-012523	Total/NA	Water	9034	346080
MB 410-346080/1-A	Method Blank	Total/NA	Water	9034	346080
LCS 410-346080/25-A	Lab Control Sample	Total/NA	Water	9034	346080

Analysis Batc: 3218776

bap SamhIV ID	CliVnt SamhIV ID	erVh PyhV	MatriT	MVt: ox	erVh Batc:
410-113811-6	NBKK-IDW16-AQ-012523	Total/NA	Water	9012	346080
410-113811-7	NBKK-IDW17-AQ-012523	Total/NA	Water	9012	346080
410-113811-8	NBKK-IDW18-AQ-012523	Total/NA	Water	9012	346080
410-113811-9	NBKK-IDW19-AQ-012523	Total/NA	Water	9012	346080
410-113811-10	NBKK-IDW20-AQ-012523	Total/NA	Water	9012	346080
MB 410-346080/1-A	Method Blank	Total/NA	Water	9012	346080
LCS 410-346080/2-A	Lab Control Sample	Total/NA	Water	9012	346080

Analysis Batc: 3218275

bap SamhIV ID	CliVnt SamhIV ID	erVh PyhV	MatriT	MVt: ox	erVh Batc:
410-113811-6	NBKK-IDW16-AQ-012523	Total/NA	Water	1010	
410-113811-7	NBKK-IDW17-AQ-012523	Total/NA	Water	1010	
410-113811-8	NBKK-IDW18-AQ-012523	Total/NA	Water	1010	
410-113811-9	NBKK-IDW19-AQ-012523	Total/NA	Water	1010	
410-113811-10	NBKK-IDW20-AQ-012523	Total/NA	Water	1010	
LCS 410-346321/1	Lab Control Sample	Total/NA	Water	1010	
LCSD 410-346321/2	Lab Control Sample Dup	Total/NA	Water	1010	

Lab Chronicle

Client: Jacobs Engineering Group, Inc.
Project/Site: CTO-4117 NBK Keyport

Job ID: 410-113811-1
SDG: NBK Keyport

Client Sample ID: NBKK-IDW11-AQ-012523

Lab Sample ID: 410-113811-1

Date Collected: 01/25/23 13:00

Matrix: Water

Date Received: 01/27/23 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			340624	QJZ6	ELLE	02/01/23 15:24
Total/NA	Analysis	8270E SIM		1	340790	SJ89	ELLE	02/02/23 14:19
Total/NA	Analysis	NWTPH-Gx		1	340603	B9BF	ELLE	02/01/23 19:06
Total/NA	Prep	3510C			342006	QJZ6	ELLE	02/06/23 15:35
Total/NA	Analysis	8082A		1	342238	JC94	ELLE	02/07/23 11:24
Total/NA	Prep	3510C			342797	QJZ6	ELLE	02/08/23 15:38
Total/NA	Analysis	NWTPH-Dx		1	342917	UHEW	ELLE	02/09/23 05:52
Total Recoverable	Prep	3005A			340849	HUH3	ELLE	02/02/23 07:43
Total Recoverable	Analysis	6020B		1	341439	F7JF	ELLE	02/03/23 10:28
Total Recoverable	Prep	3005A			342136	UAMX	ELLE	02/07/23 03:57
Total Recoverable	Analysis	6020B		1	342493	UCIG	ELLE	02/07/23 20:29
Total/NA	Prep	7470A			340937	UAMX	ELLE	02/02/23 10:03
Total/NA	Analysis	7470A		1	341529	UEFS	ELLE	02/03/23 15:54
Total/NA	Analysis	1010		1	342751	DI9Q	ELLE	02/08/23 14:00 - 02/08/23 14:00 [1]
Total/NA	Prep	7.3.4			342591	USE1	ELLE	02/08/23 08:42
Total/NA	Analysis	9012		1	343093	JCG7	ELLE	02/09/23 10:17
Total/NA	Prep	7.3.4			342591	USE1	ELLE	02/08/23 08:42
Total/NA	Analysis	9034		1	342698	USE1	ELLE	02/08/23 11:57
Total/NA	Analysis	9040C		1	340261	DI9Q	ELLE	01/31/23 17:30

Client Sample ID: NBKK-IDW12-AQ-012523

Lab Sample ID: 410-113811-2

Date Collected: 01/25/23 13:15

Matrix: Water

Date Received: 01/27/23 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			340624	QJZ6	ELLE	02/01/23 15:24
Total/NA	Analysis	8270E SIM		1	340790	SJ89	ELLE	02/02/23 14:40
Total/NA	Analysis	NWTPH-Gx		1	340603	B9BF	ELLE	02/01/23 19:32
Total/NA	Prep	3510C			342006	QJZ6	ELLE	02/06/23 15:35
Total/NA	Analysis	8082A		1	342238	JC94	ELLE	02/07/23 11:35
Total/NA	Prep	3510C			342797	QJZ6	ELLE	02/08/23 15:38
Total/NA	Analysis	NWTPH-Dx		1	342917	UHEW	ELLE	02/09/23 06:15
Total Recoverable	Prep	3005A			340849	HUH3	ELLE	02/02/23 07:43
Total Recoverable	Analysis	6020B		1	341439	F7JF	ELLE	02/03/23 11:11
Total Recoverable	Prep	3005A			342136	UAMX	ELLE	02/07/23 03:57
Total Recoverable	Analysis	6020B		1	342493	UCIG	ELLE	02/07/23 20:01
Total/NA	Prep	7470A			340385	UAMX	ELLE	02/01/23 07:16
Total/NA	Analysis	7470A		1	340588	UEFS	ELLE	02/01/23 13:36
Total/NA	Analysis	1010		1	342751	DI9Q	ELLE	02/08/23 14:00 - 02/08/23 14:00 [1]
Total/NA	Prep	7.3.4			342591	USE1	ELLE	02/08/23 08:42
Total/NA	Analysis	9012		1	343093	JCG7	ELLE	02/09/23 10:18
Total/NA	Prep	7.3.4			342591	USE1	ELLE	02/08/23 08:42
Total/NA	Analysis	9034		1	342698	USE1	ELLE	02/08/23 11:57
Total/NA	Analysis	9040C		1	340261	DI9Q	ELLE	01/31/23 17:30

Lab Chronicle

Client: Jacobs Engineering Group, Inc.
Project/Site: CTO-4117 NBK Keyport

Job ID: 410-113811-1
SDG: NBK Keyport

Client Sample ID: NBKK-IDW13-AQ-012523

Date Collected: 01/25/23 13:30
Date Received: 01/27/23 09:40

Lab Sample ID: 410-113811-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			340624	QJZ6	ELLE	02/01/23 15:24
Total/NA	Analysis	8270E SIM		1	341144	UJM0	ELLE	02/02/23 20:13
Total/NA	Analysis	NWTPH-Gx		1	340603	B9BF	ELLE	02/01/23 19:57
Total/NA	Prep	3510C			342006	QJZ6	ELLE	02/06/23 15:35
Total/NA	Analysis	8082A		1	342238	JC94	ELLE	02/07/23 11:47
Total/NA	Prep	3510C			342797	QJZ6	ELLE	02/08/23 15:38
Total/NA	Analysis	NWTPH-Dx		1	342917	UHEW	ELLE	02/09/23 06:38
Total Recoverable	Prep	3005A			341434	UAMX	ELLE	02/03/23 13:34
Total Recoverable	Analysis	6020B		1	342715	F7JF	ELLE	02/08/23 08:44
Total/NA	Prep	7470A			340385	UAMX	ELLE	02/01/23 07:16
Total/NA	Analysis	7470A		1	340588	UEFS	ELLE	02/01/23 13:34
Total/NA	Analysis	1010		1	342751	DI9Q	ELLE	02/08/23 14:00 - 02/08/23 14:00 [1]
Total/NA	Prep	7.3.4			342591	USE1	ELLE	02/08/23 08:42
Total/NA	Analysis	9012		1	343093	JCG7	ELLE	02/09/23 10:20
Total/NA	Prep	7.3.4			342591	USE1	ELLE	02/08/23 08:42
Total/NA	Analysis	9034		1	342698	USE1	ELLE	02/08/23 11:57
Total/NA	Analysis	9040C		1	340261	DI9Q	ELLE	01/31/23 17:30

Client Sample ID: NBKK-IDW14-AQ-012523

Date Collected: 01/25/23 13:45
Date Received: 01/27/23 09:40

Lab Sample ID: 410-113811-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			340624	QJZ6	ELLE	02/01/23 15:24
Total/NA	Analysis	8270E SIM		1	341144	UJM0	ELLE	02/02/23 20:34
Total/NA	Analysis	NWTPH-Gx		1	340603	B9BF	ELLE	02/01/23 20:23
Total/NA	Prep	3510C			342006	QJZ6	ELLE	02/06/23 15:35
Total/NA	Analysis	8082A		1	342238	JC94	ELLE	02/07/23 11:59
Total/NA	Prep	3510C			342797	QJZ6	ELLE	02/08/23 15:38
Total/NA	Analysis	NWTPH-Dx		1	342917	UHEW	ELLE	02/09/23 07:23
Total Recoverable	Prep	3005A			340849	HUH3	ELLE	02/02/23 07:43
Total Recoverable	Analysis	6020B		1	341439	F7JF	ELLE	02/03/23 10:53
Total Recoverable	Prep	3005A			342136	UAMX	ELLE	02/07/23 03:57
Total Recoverable	Analysis	6020B		1	342493	UCIG	ELLE	02/07/23 20:21
Total/NA	Prep	7470A			340385	UAMX	ELLE	02/01/23 07:16
Total/NA	Analysis	7470A		1	340588	UEFS	ELLE	02/01/23 13:19
Total/NA	Analysis	1010		1	342751	DI9Q	ELLE	02/08/23 14:00 - 02/08/23 14:00 [1]
Total/NA	Prep	7.3.4			342591	USE1	ELLE	02/08/23 08:42
Total/NA	Analysis	9012		1	343093	JCG7	ELLE	02/09/23 10:25
Total/NA	Prep	7.3.4			342591	USE1	ELLE	02/08/23 08:42
Total/NA	Analysis	9034		1	342698	USE1	ELLE	02/08/23 11:57
Total/NA	Analysis	9040C		1	340261	DI9Q	ELLE	01/31/23 17:30

Lab Chronicle

Client: Jacobs Engineering Group, Inc.
Project/Site: CTO-4117 NBK Keyport

Job ID: 410-113811-1
SDG: NBK Keyport

Client Sample ID: NBKK-IDW15-AQ-012523

Lab Sample ID: 410-113811-5

Date Collected: 01/25/23 12:45

Matrix: Water

Date Received: 01/27/23 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			340624	QJZ6	ELLE	02/01/23 15:24
Total/NA	Analysis	8270E SIM		1	341144	UJM0	ELLE	02/02/23 20:55
Total/NA	Analysis	NWTPH-Gx		1	340603	B9BF	ELLE	02/01/23 20:48
Total/NA	Prep	3510C			342006	QJZ6	ELLE	02/06/23 15:35
Total/NA	Analysis	8082A		1	342238	JC94	ELLE	02/07/23 12:11
Total/NA	Prep	3510C			342797	QJZ6	ELLE	02/08/23 15:38
Total/NA	Analysis	NWTPH-Dx		1	342917	UHEW	ELLE	02/09/23 08:31
Total Recoverable	Prep	3005A			340849	HUH3	ELLE	02/02/23 07:44
Total Recoverable	Analysis	6020B		1	341439	F7JF	ELLE	02/03/23 11:15
Total Recoverable	Prep	3005A			342136	UAMX	ELLE	02/07/23 03:57
Total Recoverable	Analysis	6020B		1	342493	UCIG	ELLE	02/07/23 20:23
Total/NA	Prep	7470A			340385	UAMX	ELLE	02/01/23 07:16
Total/NA	Analysis	7470A		1	340588	UEFS	ELLE	02/01/23 13:38
Total/NA	Analysis	1010		1	342751	DI9Q	ELLE	02/08/23 14:00 - 02/08/23 14:00 [1]
Total/NA	Prep	7.3.4			342591	USE1	ELLE	02/08/23 08:42
Total/NA	Analysis	9012		1	343093	JCG7	ELLE	02/09/23 10:27
Total/NA	Prep	7.3.4			342591	USE1	ELLE	02/08/23 08:42
Total/NA	Analysis	9034		1	342698	USE1	ELLE	02/08/23 11:57
Total/NA	Analysis	9040C		1	340261	DI9Q	ELLE	01/31/23 17:30

Client Sample ID: NBKK-IDW16-AQ-012523

Lab Sample ID: 410-113811-6

Date Collected: 01/25/23 12:30

Matrix: Water

Date Received: 01/27/23 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			340624	QJZ6	ELLE	02/01/23 15:24
Total/NA	Analysis	8270E SIM		1	341144	UJM0	ELLE	02/02/23 21:17
Total/NA	Prep	3510C	RE		342372	QJZ6	ELLE	02/07/23 15:34
Total/NA	Analysis	8270E SIM	RE	1	342434	SJ89	ELLE	02/08/23 04:36
Total/NA	Analysis	NWTPH-Gx		1	340603	B9BF	ELLE	02/01/23 21:13
Total/NA	Prep	3510C			342006	QJZ6	ELLE	02/06/23 15:35
Total/NA	Analysis	8082A		1	342238	JC94	ELLE	02/07/23 12:58
Total/NA	Prep	3510C			342797	QJZ6	ELLE	02/08/23 15:38
Total/NA	Analysis	NWTPH-Dx		1	342917	UHEW	ELLE	02/09/23 08:53
Total Recoverable	Prep	3005A			340849	HUH3	ELLE	02/02/23 07:44
Total Recoverable	Analysis	6020B		1	341439	F7JF	ELLE	02/03/23 11:17
Total/NA	Prep	7470A			340385	UAMX	ELLE	02/01/23 07:16
Total/NA	Analysis	7470A		1	340588	UEFS	ELLE	02/01/23 13:26
Total/NA	Analysis	1010		1	346321	USAE	ELLE	02/21/23 06:46 - 02/21/23 06:46 [1]
Total/NA	Prep	7.3.4			346080	USE1	ELLE	02/20/23 09:04
Total/NA	Analysis	9012		1	346220	UJE2	ELLE	02/20/23 16:20
Total/NA	Prep	7.3.4			346080	USE1	ELLE	02/20/23 09:04
Total/NA	Analysis	9034		1	346154	USE1	ELLE	02/20/23 13:15
Total/NA	Analysis	9040C		1	340261	DI9Q	ELLE	01/31/23 17:30

Lab Chronicle

Client: Jacobs Engineering Group, Inc.
Project/Site: CTO-4117 NBK Keyport

Job ID: 410-113811-1
SDG: NBK Keyport

Client Sample ID: NBKK-IDW17-AQ-012523

Lab Sample ID: 410-113811-7

Date Collected: 01/25/23 12:15

Matrix: Water

Date Received: 01/27/23 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			340624	QJZ6	ELLE	02/01/23 15:24
Total/NA	Analysis	8270E SIM		1	341144	UJM0	ELLE	02/02/23 21:38
Total/NA	Analysis	NWTPH-Gx		1	340603	B9BF	ELLE	02/01/23 21:38
Total/NA	Prep	3510C			342006	QJZ6	ELLE	02/06/23 15:35
Total/NA	Analysis	8082A		1	342238	JC94	ELLE	02/07/23 13:09
Total/NA	Prep	3510C			342797	QJZ6	ELLE	02/08/23 15:38
Total/NA	Analysis	NWTPH-Dx		1	342917	UHEW	ELLE	02/09/23 09:16
Total Recoverable	Prep	3005A			341434	UAMX	ELLE	02/03/23 13:34
Total Recoverable	Analysis	6020B		1	342715	F7JF	ELLE	02/08/23 08:42
Total/NA	Prep	7470A			340385	UAMX	ELLE	02/01/23 07:16
Total/NA	Analysis	7470A		1	340588	UEFS	ELLE	02/01/23 13:28
Total/NA	Analysis	1010		1	346321	USAE	ELLE	02/21/23 06:46 - 02/21/23 06:46 [1]
Total/NA	Prep	7.3.4			346080	USE1	ELLE	02/20/23 09:04
Total/NA	Analysis	9012		1	346220	UJE2	ELLE	02/20/23 16:20
Total/NA	Prep	7.3.4			346080	USE1	ELLE	02/20/23 09:04
Total/NA	Analysis	9034		1	346154	USE1	ELLE	02/20/23 13:15
Total/NA	Analysis	9040C		1	340261	DI9Q	ELLE	01/31/23 17:30

Client Sample ID: NBKK-IDW18-AQ-012523

Lab Sample ID: 410-113811-8

Date Collected: 01/25/23 12:00

Matrix: Water

Date Received: 01/27/23 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			340624	QJZ6	ELLE	02/01/23 15:24
Total/NA	Analysis	8270E SIM		1	341144	UJM0	ELLE	02/02/23 22:00
Total/NA	Analysis	NWTPH-Gx		1	340603	B9BF	ELLE	02/01/23 22:04
Total/NA	Prep	3510C			342006	QJZ6	ELLE	02/06/23 15:35
Total/NA	Analysis	8082A		1	342238	JC94	ELLE	02/07/23 13:21
Total/NA	Prep	3510C			342797	QJZ6	ELLE	02/08/23 15:38
Total/NA	Analysis	NWTPH-Dx		1	342917	UHEW	ELLE	02/09/23 09:39
Total Recoverable	Prep	3005A			340849	HUH3	ELLE	02/02/23 07:43
Total Recoverable	Analysis	6020B		1	341439	F7JF	ELLE	02/03/23 10:38
Total Recoverable	Prep	3005A			342136	UAMX	ELLE	02/07/23 03:57
Total Recoverable	Analysis	6020B		1	342493	UCIG	ELLE	02/07/23 20:25
Total/NA	Prep	7470A			340385	UAMX	ELLE	02/01/23 07:16
Total/NA	Analysis	7470A		1	340588	UEFS	ELLE	02/01/23 13:24
Total/NA	Analysis	1010		1	346321	USAE	ELLE	02/21/23 06:46 - 02/21/23 06:46 [1]
Total/NA	Prep	7.3.4			346080	USE1	ELLE	02/20/23 09:04
Total/NA	Analysis	9012		1	346220	UJE2	ELLE	02/20/23 16:20
Total/NA	Prep	7.3.4			346080	USE1	ELLE	02/20/23 09:04
Total/NA	Analysis	9034		1	346154	USE1	ELLE	02/20/23 13:15
Total/NA	Analysis	9040C		1	340261	DI9Q	ELLE	01/31/23 17:30

Client Sample ID: NBKK-IDW19-AQ-012523

Lab Sample ID: 410-113811-9

Date Collected: 01/25/23 11:45

Matrix: Water

Date Received: 01/27/23 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			340624	QJZ6	ELLE	02/01/23 15:24
Total/NA	Analysis	8270E SIM		1	341144	UJM0	ELLE	02/02/23 22:21
Total/NA	Analysis	NWTPH-Gx		1	340603	B9BF	ELLE	02/01/23 22:29
Total/NA	Prep	3510C			347500	QJZ6	ELLE	02/23/23 16:56
Total/NA	Analysis	8082A		1	347667	GM5C	ELLE	02/24/23 09:07
Total/NA	Prep	3510C			342797	QJZ6	ELLE	02/08/23 15:38
Total/NA	Analysis	NWTPH-Dx		1	342917	UHEW	ELLE	02/09/23 10:01
Total Recoverable	Prep	3005A			340849	HUH3	ELLE	02/02/23 07:43
Total Recoverable	Analysis	6020B		1	341439	F7JF	ELLE	02/03/23 10:30
Total Recoverable	Prep	3005A			342136	UAMX	ELLE	02/07/23 03:57
Total Recoverable	Analysis	6020B		1	342493	UCIG	ELLE	02/07/23 20:27
Total/NA	Prep	7470A			340385	UAMX	ELLE	02/01/23 07:16
Total/NA	Analysis	7470A		1	340588	UEFS	ELLE	02/01/23 13:22
Total/NA	Analysis	1010		1	346321	USAE	ELLE	02/21/23 06:46 - 02/21/23 06:46 [1]
Total/NA	Prep	7.3.4			346080	USE1	ELLE	02/20/23 09:04
Total/NA	Analysis	9012		1	346220	UJE2	ELLE	02/20/23 16:21
Total/NA	Prep	7.3.4			346080	USE1	ELLE	02/20/23 09:04
Total/NA	Analysis	9034		1	346154	USE1	ELLE	02/20/23 13:15
Total/NA	Analysis	9040C		1	340261	DI9Q	ELLE	01/31/23 17:30

Client Sample ID: NBKK-IDW20-AQ-012523

Lab Sample ID: 410-113811-10

Date Collected: 01/25/23 11:20

Matrix: Water

Date Received: 01/27/23 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			340624	QJZ6	ELLE	02/01/23 15:24
Total/NA	Analysis	8270E SIM		1	341144	UJM0	ELLE	02/02/23 22:43
Total/NA	Analysis	NWTPH-Gx		1	340603	B9BF	ELLE	02/01/23 23:19
Total/NA	Prep	3510C			342006	QJZ6	ELLE	02/06/23 15:35
Total/NA	Analysis	8082A		1	342238	JC94	ELLE	02/07/23 13:46
Total/NA	Prep	3510C			342797	QJZ6	ELLE	02/08/23 15:38
Total/NA	Analysis	NWTPH-Dx		1	342917	UHEW	ELLE	02/09/23 10:46
Total Recoverable	Prep	3005A			340849	HUH3	ELLE	02/02/23 07:43
Total Recoverable	Analysis	6020B		1	341439	F7JF	ELLE	02/03/23 10:40
Total/NA	Prep	7470A			340385	UAMX	ELLE	02/01/23 07:16
Total/NA	Analysis	7470A		1	340588	UEFS	ELLE	02/01/23 13:40
Total/NA	Analysis	1010		1	346321	USAE	ELLE	02/21/23 06:46 - 02/21/23 06:46 [1]
Total/NA	Prep	7.3.4			346080	USE1	ELLE	02/20/23 09:04
Total/NA	Analysis	9012		1	346220	UJE2	ELLE	02/20/23 16:22
Total/NA	Prep	7.3.4			346080	USE1	ELLE	02/20/23 09:04
Total/NA	Analysis	9034		1	346154	USE1	ELLE	02/20/23 13:15
Total/NA	Analysis	9040C		1	340261	DI9Q	ELLE	01/31/23 17:30

[1] Completion dates and times are reported or not reported per method requirements or individual lab discretion.

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Environment Testing, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Accreditation/Certification Summary

Client: Jacobs Engineering Group, Inc.
Project/Site: CTO-4117 NBK Keyport

Job ID: 410-113811-1
SDG: NBK Keyport

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
A2LA	Dept. of Defense ELAP	0001.01	11-30-24

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
1010		Water	Flashpoint
9034	7.3.4	Water	Sulfide, Reactive

Washington	State	C457	04-11-23

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
1010		Water	Flashpoint
6020B	3005A	Water	Arsenic
6020B	3005A	Water	Barium
6020B	3005A	Water	Cadmium
6020B	3005A	Water	Chromium
6020B	3005A	Water	Copper
6020B	3005A	Water	Lead
6020B	3005A	Water	Nickel
6020B	3005A	Water	Selenium
6020B	3005A	Water	Silver
6020B	3005A	Water	Zinc
7470A	7470A	Water	Mercury
8082A	3510C	Water	PCB-1016 (1C)
8082A	3510C	Water	PCB-1221 (1C)
8082A	3510C	Water	PCB-1232 (1C)
8082A	3510C	Water	PCB-1242 (1C)
8082A	3510C	Water	PCB-1248 (1C)
8082A	3510C	Water	PCB-1254 (1C)
8082A	3510C	Water	PCB-1260 (1C)
8270E SIM	3510C	Water	1-Methylnaphthalene
8270E SIM	3510C	Water	2-Methylnaphthalene
8270E SIM	3510C	Water	Acenaphthene
8270E SIM	3510C	Water	Acenaphthylene
8270E SIM	3510C	Water	Anthracene
8270E SIM	3510C	Water	Benzo[a]anthracene
8270E SIM	3510C	Water	Benzo[a]pyrene
8270E SIM	3510C	Water	Benzo[b]fluoranthene
8270E SIM	3510C	Water	Benzo[g,h,i]perylene
8270E SIM	3510C	Water	Benzo[k]fluoranthene
8270E SIM	3510C	Water	Chrysene
8270E SIM	3510C	Water	Dibenz(a,h)anthracene
8270E SIM	3510C	Water	Fluoranthene
8270E SIM	3510C	Water	Fluorene
8270E SIM	3510C	Water	Indeno[1,2,3-cd]pyrene
8270E SIM	3510C	Water	Naphthalene
8270E SIM	3510C	Water	Phenanthrene
8270E SIM	3510C	Water	Pyrene
9012	7.3.4	Water	Cyanide, Reactive
9034	7.3.4	Water	Sulfide, Reactive

Client: Jacobs Engineering Group, Inc.
Project/Site: CTO-4117 NBK Keyport

Job ID: 410-113811-1
SDG: NBK Keyport

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC (Continued)

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
9040C		Water	Corrosivity
9040C		Water	pH

Method Summary

Client: Jacobs Engineering Group, Inc.
BrokectyPite: CW8 -411V j / S SeNport

Job ID: 410-116211-1
PDG: j / S SeNport

Method	Method Description	Protocol	Laboratory
2dV0E PI(	PeMi) olatile 8 rganic CoMpounLs 7GCy(P PI(v	PO 24m	ETTE
j O WBH-Gx	j orthwest - Aolatile BetroleuM BroLucts 7GCv	j O WBH	ETTE
202dk	BolNchlorinateL / iphenNs 7BC/ sv bN Gas ChroMatographN	PO 24m	ETTE
j O WBH-Dx	j orthwest - PeMi-Aolatile BetroleuM BroLucts 7GCv	j O WBH	ETTE
m0d0/	(etals 7ICBy(Pv	PO 24m	ETTE
V4V0k	(ercurN 7CAk k v	PO 24m	ETTE
1010	IgnitabilitN, Bens9N-(artens CloseL-Cup (ethoL	PO 24m	ETTE
R01d	CNaniLe, 3 eacti) e	PO 24m	ETTE
R064	PulfiLe, 3 eacti) e	PO 24m	ETTE
R040C	pH	PO 24m	ETTE
6005k	Breparation, Wbtal 3 eco) erable or Dissol) eL (etals	PO 24m	ETTE
6510C	TiquiL-TiquiL Extraction 7PeparatorN Funnelv	PO 24m	ETTE
5060/	Burge anL Wap	PO 24m	ETTE
V.6.6	CNaniLe, 3 eacti) e	PO 24m	ETTE
V.6.4	PulfiLe, 3 eacti) e	PO 24m	ETTE
V4V0k	Breparation, (ercurN	PO 24m	ETTE

Protocol References:

j O WBH U j orthwest Wbtal BetroleuM HNLrocarbon

PO 24mU =Vest (ethoLs For E) aluating PoliL O aste, BhNsicalyCheMical (ethoLs=, WhirL ELition, j o) eMber 1R2mk nL Its " pLates.

Laboratory References:

ETTE U Eurofins Tancaster Taboratories En) ironMent Westing, TTC, d4d5 j ew HollanL Bi9e, Tancaster, Bk 1Vm01, WET 7V1Vvm5m-d600

Sample Summary

Client: Jacobs Engineering Group, Inc.
Project/Site: CTO-4117 NBK Keyport

Job ID: 410-113811-1
SDG: NBK Keyport

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
410-113811-1	NBKK-IDW11-AQ-012523	Water	01/25/23 13:00	01/27/23 09:40
410-113811-2	NBKK-IDW12-AQ-012523	Water	01/25/23 13:15	01/27/23 09:40
410-113811-3	NBKK-IDW13-AQ-012523	Water	01/25/23 13:30	01/27/23 09:40
410-113811-4	NBKK-IDW14-AQ-012523	Water	01/25/23 13:45	01/27/23 09:40
410-113811-5	NBKK-IDW15-AQ-012523	Water	01/25/23 12:45	01/27/23 09:40
410-113811-6	NBKK-IDW16-AQ-012523	Water	01/25/23 12:30	01/27/23 09:40
410-113811-7	NBKK-IDW17-AQ-012523	Water	01/25/23 12:15	01/27/23 09:40
410-113811-8	NBKK-IDW18-AQ-012523	Water	01/25/23 12:00	01/27/23 09:40
410-113811-9	NBKK-IDW19-AQ-012523	Water	01/25/23 11:45	01/27/23 09:40
410-113811-10	NBKK-IDW20-AQ-012523	Water	01/25/23 11:20	01/27/23 09:40

410-113811 Chain of Custody

Chain of Custody Record

eurofins | Environment Testing America

Client Information	Sampler: Tim Anderson	Lab PM: Dutton, Tracy L	Carrier Tracking No(s):	COC No: 580-48044-15408.1
Client Contact: Gail DeRuzzo	Phone: 702 686 7448	E-Mail: Tracy.Dutton@et.eurofinsus.com	State of Origin: WA	Page: Page
Company: Battelle	PWSID:			Job #: 704 758 CH
Address: PO BOX 84262	Due Date Requested:			
City: Seattle	TAT Requested (days):			
State, Zip: WA, 98124-5562	Compliance Project: Δ Yes Δ No			
Phone:	PO #: Purchase Order Requested			
Email: deruzzo@battelle.org	WO #:			
Project Name: OU1 at NBK Keyport (RFP) 22-0773	Project #: 58017858			
Site: NBK Keyport	SSOW#:			

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Moisture - Local Method (struck)	8260D_DOD5 - 8VOC - Chloroethane (struck)	8270E_SIM - 1,4-Dioxane (struck) / SIM DOD	8082A_DOD5, 8082A-DOD5	9012 Reactive	9034 Reactive	8260 (struck)	1010-Ignitability, 9040C pH/Corrosive	7470A - DOD5, 6020B - DOD5	NWTPH-Dx	NWTPH-Gx	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	J	N	N	N	N	A						
NBKK-IDW11-AQ-012523	1-25-23	1300	G	W	N	N			X	X	X	X		X	X	X	X		
NBKK-IDW12-AQ-012523		1315							X	X	X	X	X	X	X	X	X		
NBKK-IDW13-AQ-012523		1330							X	X	X	X		X	X	X	X		
NBKK-IDW14-AQ-012523		1345							X	X	X	X	X	X	X	X	X		
NBKK-IDW15-AQ-012523		1245							X	X	X	X		X	X	X	X		
NBKK-IDW16-AQ-012523		1230							X	X	X	X	X	X	X	X	X		
NBKK-IDW17-AQ-012523		1215							X	X	X	X		X	X	X	X		
NBKK-IDW18-AQ-012523		1200							X	X	X	X		X	X	X	X		
NBKK-IDW19-AQ-012523		1145							X	X	X	X		X	X	X	X		
NBKK-IDW20-AQ-012523		1120 (1170)							X	X	X	X	X	X	X	X	X		

Possible Hazard Identification: ☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Tim Anderson	1-26-23	Jacobs			
				1/27/23 09:40	ELLET

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 1.1-3.8

Ver: 01/16/2019

2/24/2023

Login Sample Receipt Checklist

Client: Jacobs Engineering Group, Inc.

Job Number: 410-113811-1
SDG Number: NBK Keyport

Login Number: 113811
List Number: 1
Creator: Renner, Melissa

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC

Question	Answer	Comment
The cooler's custody seal is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable (</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	False	Refer to Job Narrative for details.
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	True	
Sample custody seals are intact.	True	
VOA sample vials do not have headspace >6mm in diameter (none, if from WV)?	True	

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1 2 3 4 5 6 7 8 9 10 11 12 13 14

ANALYTICAL REPORT

PREPARED FOR

Attn: Juan Acaron
Jacobs Engineering Group, Inc.
3011 SW Willston Road
Gainesville, Florida 32608-3964

Generated 3/12/2023 11:41:26 PM

JOB DESCRIPTION

CTO-4117 NBK Keyport
SDG NUMBER NBK Keyport

JOB NUMBER

410-113811-2

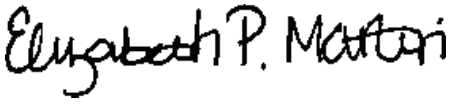
Eurofins Lancaster Laboratories Environment Testing, LLC
2425 New Holland Pike
Lancaster PA 17601

See page two for job notes and contact information.

Job Notes

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Authorization



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3/12/2023 11:41:26 PM

Authorized for release by
Elizabeth Martin, Project Manager
Elizabeth.Martin@et.eurofinsus.com
(717)205-3949

Compliance Statement

Analytical test results meet all requirements of the associated regulatory program (e.g., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis. Data qualifiers are applied to note exceptions. Noncompliant quality control (QC) is further explained in narrative comments.
· QC results that exceed the upper limits and are associated with non-detect samples are qualified but further narration is not required since the bias is high and does not change a non-detect result. Further narration is also not required with QC blank detection when the associated sample concentration is non-detect or more than ten times the level in the blank.
· Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD is performed, unless otherwise specified in the method.
· Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.
Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Measurement uncertainty values, as applicable, are available upon request.

Test results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" and tested in the laboratory are not performed within 15 minutes of collection.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. The foregoing express warranty is exclusive and is given in lieu of all other warranties, expressed or implied, except as otherwise agreed. We disclaim any other warranties, expressed or implied, including a warranty of fitness for particular purpose and warranty of merchantability. In no event shall Eurofins Lancaster Laboratories Environmental, LLC be liable for indirect, special, consequential, or incidental damages including, but not limited to, damages for loss of profit or goodwill regardless of (A) the negligence (either sole or concurrent) of Eurofins Lancaster Laboratories Environmental and (B) whether Eurofins Lancaster Laboratories Environmental has been informed of the possibility of such damages. We accept no legal responsibility for the purposes for which the client uses the test results. Except as otherwise agreed, no purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

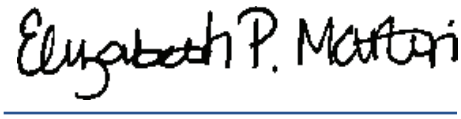


Table of Contents

Definitions/Glossary

Client: Jacobs Engineering Group, Inc.
Project/Site: CTO-4117 NBK Keyport

Job ID: 410-113811-2
SDG: NBK Keyport

Qualifiers

Subcontract

Qualifier	Qualifier Description
J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND)

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 410-113811-2

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC

Narrative

Job Narrative
410-113811-2

Receipt
The samples were received on 1/27/2023 9:40 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 5 coolers at receipt time were 1.1°C, 1.2°C, 1.3°C, 2.7°C and 3.8°C.

Receipt Exceptions
The Chain-of-Custody (COC) was incomplete as received and/or improperly completed. Containers were received for TOX analysis; however, TOX analysis was not listed on the COC. Per client instruction, the lab should proceed with subcontracting TOX analysis.

Subcontracting
The following analysis was subcontracted to ALS Environmental: TOX (Total Organic Halogens).

Subcontract Lab non-Sister Lab
See attached subcontract report.

Detection Summary

Client: Jacobs Engineering Group, Inc.
Project/Site: CTO-4117 NBK Keyport

Job ID: 410-113811-2
SDG: NBK Keyport

Client Sample ID: NBKK-IDW11-AQ-012523 — Lab Sample ID: 410-113811-1

No Detections.

Client Sample ID: NBKK-IDW12-AQ-012523 — Lab Sample ID: 410-113811-2

No Detections.

Client Sample ID: NBKK-IDW13-AQ-012523 — Lab Sample ID: 410-113811-3

No Detections.

Client Sample ID: NBKK-IDW14-AQ-012523 — Lab Sample ID: 410-113811-4

No Detections.

Client Sample ID: NBKK-IDW15-AQ-012523 — Lab Sample ID: 410-113811-5

No Detections.

Client Sample ID: NBKK-IDW16-AQ-012523 — Lab Sample ID: 410-113811-6

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Halogen, Total Organic (TOX)	205		16			ug/L	1	☼	EPA 9020B	Total/NA

Client Sample ID: NBKK-IDW17-AQ-012523 — Lab Sample ID: 410-113811-7

No Detections.

Client Sample ID: NBKK-IDW18-AQ-012523 — Lab Sample ID: 410-113811-8

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Halogen, Total Organic (TOX)	21.6		16			ug/L	1	☼	EPA 9020B	Total/NA

Client Sample ID: NBKK-IDW19-AQ-012523 — Lab Sample ID: 410-113811-9

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Halogen, Total Organic (TOX)	36.2		16			ug/L	1	☼	EPA 9020B	Total/NA

Client Sample ID: NBKK-IDW20-AQ-012523 — Lab Sample ID: 410-113811-10

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Halogen, Total Organic (TOX)	223		16			ug/L	1	☼	EPA 9020B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: NBKK-IDW11-AQ-012523

Lab Sample ID: 410-113811-1
Date Collected: 01/25/23 13:00
Matrix: Water
Date Received: 01/27/23 09:40
Percent Solids: 0

Method: EPA 9020B - EPA 9020B TOX
Lab: ALS Environmental - Middletown, PA

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Halogen, Total Organic (TOX)	14.9	J	16			ug/L	☼	02/21/23 18:12	1

Client Sample ID: NBKK-IDW12-AQ-012523

Lab Sample ID: 410-113811-2
Date Collected: 01/25/23 13:15
Matrix: Water
Date Received: 01/27/23 09:40
Percent Solids: 0

Method: EPA 9020B - EPA 9020B TOX
Lab: ALS Environmental - Middletown, PA

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Halogen, Total Organic (TOX)	ND	U	16			ug/L	☼	02/21/23 18:12	1

Client Sample ID: NBKK-IDW13-AQ-012523

Lab Sample ID: 410-113811-3
Date Collected: 01/25/23 13:30
Matrix: Water
Date Received: 01/27/23 09:40
Percent Solids: 0

Method: EPA 9020B - EPA 9020B TOX
Lab: ALS Environmental - Middletown, PA

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Halogen, Total Organic (TOX)	ND	U	16			ug/L	☼	02/21/23 18:12	1

Client Sample ID: NBKK-IDW14-AQ-012523

Lab Sample ID: 410-113811-4
Date Collected: 01/25/23 13:45
Matrix: Water
Date Received: 01/27/23 09:40
Percent Solids: 0

Method: EPA 9020B - EPA 9020B TOX
Lab: ALS Environmental - Middletown, PA

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Halogen, Total Organic (TOX)	ND	U	16			ug/L	☼	02/21/23 18:12	1

Client Sample ID: NBKK-IDW15-AQ-012523

Lab Sample ID: 410-113811-5
Date Collected: 01/25/23 12:45
Matrix: Water
Date Received: 01/27/23 09:40
Percent Solids: 0

Method: EPA 9020B - EPA 9020B TOX
Lab: ALS Environmental - Middletown, PA

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Halogen, Total Organic (TOX)	15.4	J	16			ug/L	☼	02/21/23 18:12	1

Client Sample ID: NBKK-IDW16-AQ-012523

Lab Sample ID: 410-113811-6
Date Collected: 01/25/23 12:30
Matrix: Water
Date Received: 01/27/23 09:40
Percent Solids: 0

Method: EPA 9020B - EPA 9020B TOX
Lab: ALS Environmental - Middletown, PA

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Halogen, Total Organic (TOX)	**205**		16			ug/L	☼	02/21/23 18:12	1

Client Sample ID: NBKK-IDW17-AQ-012523

Lab Sample ID: 410-113811-7
Date Collected: 01/25/23 12:15
Matrix: Water
Date Received: 01/27/23 09:40
Percent Solids: 0

Method: EPA 9020B - EPA 9020B TOX
Lab: ALS Environmental - Middletown, PA

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Halogen, Total Organic (TOX)	ND	U	16			ug/L	☼	02/21/23 18:12	1

Client Sample ID: NBKK-IDW18-AQ-012523

Lab Sample ID: 410-113811-8
Date Collected: 01/25/23 12:00
Matrix: Water
Date Received: 01/27/23 09:40
Percent Solids: 0

Method: EPA 9020B - EPA 9020B TOX
Lab: ALS Environmental - Middletown, PA

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Halogen, Total Organic (TOX)	21.6		16			ug/L	☼	02/21/23 18:12	1

Client Sample ID: NBKK-IDW19-AQ-012523

Lab Sample ID: 410-113811-9
Date Collected: 01/25/23 11:45
Matrix: Water
Date Received: 01/27/23 09:40
Percent Solids: 0

Method: EPA 9020B - EPA 9020B TOX
Lab: ALS Environmental - Middletown, PA

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Halogen, Total Organic (TOX)	36.2		16			ug/L	☼	02/22/23 17:35	1

Client Sample ID: NBKK-IDW20-AQ-012523

Lab Sample ID: 410-113811-10
Date Collected: 01/25/23 11:20
Matrix: Water
Date Received: 01/27/23 09:40
Percent Solids: 0

Method: EPA 9020B - EPA 9020B TOX
Lab: ALS Environmental - Middletown, PA

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Halogen, Total Organic (TOX)	223		16			ug/L	☼	02/22/23 17:35	1

Method: EPA 9020B - EPA 9020B TOX

Lab Sample ID: 3628302
Matrix: Water
Analysis Batch: 951531

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 951531_P

Analyte	Blank Result	Blank Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
9alogen, Total Organic 6TOL☼	ND	H	8			ug/(	x	02/21/23 18:12	1

Lab Sample ID: 3628414
Matrix: Water
Analysis Batch: 951531

Client Sample ID: NBKK-IDW12-AQ-012523 MS
Prep Type: Total/NA
Prep Batch: 951531_P

Analyte	Sample Result	Sample Qualifier	Spike Added	Matrix Spike Result	Matrix Spike Qualifier	Unit	D	%Rec	%Rec Limits		
9alogen, Total Organic 6TOL☼	1) .0H		200.3)	207		ug/(	x	103	80 - 120		

Lab Sample ID: 3628415
Matrix: Water
Analysis Batch: 951531

Client Sample ID: NBKK-IDW12-AQ-012523 MSD
Prep Type: Total/NA
Prep Batch: 951531_P

Analyte	Sample Result	Sample Qualifier	Spike Added	ix Spike Dup Result	Matrix Spike D Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
9alogen, Total Organic 6TOL☼	1) .0H		200.3)	201		ug/(	x	100	80 - 120	2.UU	20

Lab Sample ID: 3628878
Matrix: Water
Analysis Batch: 952077

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 952077_P

Analyte	Blank Result	Blank Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
9alogen, Total Organic 6TOL☼	ND	H	8			ug/(	x	02/22/23 17:35	1

Lab Sample ID: 3629091
Matrix: Water
Analysis Batch: 952077

Client Sample ID: NBKK-IDW19-AQ-012523 MS
Prep Type: Total/NA
Prep Batch: 952077_P

Analyte	Sample Result	Sample Qualifier	Spike Added	Matrix Spike Result	Matrix Spike Qualifier	Unit	D	%Rec	%Rec Limits		
9alogen, Total Organic 6TOL☼	3) .2		23) .2	214		ug/(	x	88.U	80 - 120		

Lab Sample ID: 3629092
Matrix: Water
Analysis Batch: 952077

Client Sample ID: NBKK-IDW19-AQ-012523 MSD
Prep Type: Total/NA
Prep Batch: 952077_P

Analyte	Sample Result	Sample Qualifier	Spike Added	ix Spike Dup Result	Matrix Spike D Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
9alogen, Total Organic 6TOL☼	3) .2		23) .2	228		ug/(	x	U5.8	80 - 120	) .27	20

Subcontract

Analysis Batch: 951531

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-116211-1	/ SNN-ID_ 11-W7 -01CCC6	Aoacid W	_ canG	gKW50C0S	5O1C61TK
410-116211-C	/ SNN-ID_ 1C-W7 -01CCC6	Aoacid W	_ canG	gKW50C0S	5O1C61TK
410-116211-6	/ SNN-ID_ 16-W7 -01CCC6	Aoacid W	_ canG	gKW50C0S	5O1C61TK
410-116211-4	/ SNN-ID_ 14-W7 -01CCC6	Aoacid W	_ canG	gKW50C0S	5O1C61TK
410-116211-O	/ SNN-ID_ 1O-W7 -01CCC6	Aoacid W	_ canG	gKW50C0S	5O1C61TK
410-116211-8	/ SNN-ID_ 18-W7 -01CCC6	Aoacid W	_ canG	gKW50C0S	5O1C61TK
410-116211-3	/ SNN-ID_ 13-W7 -01CCC6	Aoacid W	_ canG	gKW50C0S	5O1C61TK
410-116211-2	/ SNN-ID_ 12-W7 -01CCC6	Aoacid W	_ canG	gKW50C0S	5O1C61TK
68C260C	QnaMoh Sict k	Aoacid W	_ canG	gKW50C0S	5O1C61TK
68C2414	/ SNN-ID_ 1C-W7 -01CCC6 Qj	Aoacid W	_ canG	gKW50C0S	5O1C61TK
68C241O	/ SNN-ID_ 1C-W7 -01CCC6 Qj D	Aoacid W	_ canG	gKW50C0S	5O1C61TK

Analysis Batch: 952077

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-116211-5	/ SNN-ID_ 15-W7 -01CCC6	Aoacid W	_ canG	gKW50C0S	5CC033TK
410-116211-10	/ SNN-ID_ C0-W7 -01CCC6	Aoacid W	_ canG	gKW50C0S	5CC033TK
68C2232	QnaMoh Sict k	Aoacid W	_ canG	gKW50C0S	5CC033TK
68C5051	/ SNN-ID_ 15-W7 -01CCC6 Qj	Aoacid W	_ canG	gKW50C0S	5CC033TK
68C505C	/ SNN-ID_ 15-W7 -01CCC6 Qj D	Aoacid W	_ canG	gKW50C0S	5CC033TK

Prep Batch: 951531_P

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-116211-1	/ SNN-ID_ 11-W7 -01CCC6	Aoacid W	_ canG	/ W	
410-116211-C	/ SNN-ID_ 1C-W7 -01CCC6	Aoacid W	_ canG	/ W	
410-116211-6	/ SNN-ID_ 16-W7 -01CCC6	Aoacid W	_ canG	/ W	
410-116211-4	/ SNN-ID_ 14-W7 -01CCC6	Aoacid W	_ canG	/ W	
410-116211-O	/ SNN-ID_ 1O-W7 -01CCC6	Aoacid W	_ canG	/ W	
410-116211-8	/ SNN-ID_ 18-W7 -01CCC6	Aoacid W	_ canG	/ W	
410-116211-3	/ SNN-ID_ 13-W7 -01CCC6	Aoacid W	_ canG	/ W	
410-116211-2	/ SNN-ID_ 12-W7 -01CCC6	Aoacid W	_ canG	/ W	
68C260C	QnaMoh Sict k	Aoacid W	_ canG	/ W	
68C2414	/ SNN-ID_ 1C-W7 -01CCC6 Qj	Aoacid W	_ canG	/ W	
68C241O	/ SNN-ID_ 1C-W7 -01CCC6 Qj D	Aoacid W	_ canG	/ W	

Prep Batch: 952077_P

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-116211-5	/ SNN-ID_ 15-W7 -01CCC6	Aoacid W	_ canG	/ W	
410-116211-10	/ SNN-ID_ C0-W7 -01CCC6	Aoacid W	_ canG	/ W	
68C2232	QnaMoh Sict k	Aoacid W	_ canG	/ W	
68C5051	/ SNN-ID_ 15-W7 -01CCC6 Qj	Aoacid W	_ canG	/ W	
68C505C	/ SNN-ID_ 15-W7 -01CCC6 Qj D	Aoacid W	_ canG	/ W	

Lab Chronicle

Client: Jacobs Engineering Group, Inc.
Project/Site: CTO-4117 NBK Keyport

Job ID: 410-113811-2
SDG: NBK Keyport

Client Sample ID: NBKK-IDW11-AQ-012523
Lab Sample ID: 410-113811-1

Date Collected: 01/25/23 13:00
Matrix: Water
Date 7 ecei9ed: 01/2T/23 0y:40
Rercent Solidv: 0

Rrep Pspe	Batch Pspe	Batch Method	7un	Dilution Factor	Batch Number	Analsvt	Lab	Rrepared or Analszed
Total/NA	Prep	NA		1	951531_P		ALS MTown	02/21/23 18:12
Total/NA	Analysis	EPA 9020B		1	951531	PAG	ALS MTown	02/21/23 18:12

Client Sample ID: NBKK-IDW12-AQ-012523
Lab Sample ID: 410-113811-2

Date Collected: 01/25/23 13:15
Matrix: Water
Date 7 ecei9ed: 01/2T/23 0y:40
Rercent Solidv: 0

Rrep Pspe	Batch Pspe	Batch Method	7un	Dilution Factor	Batch Number	Analsvt	Lab	Rrepared or Analszed
Total/NA	Prep	NA		1	951531_P		ALS MTown	02/21/23 18:12
Total/NA	Analysis	EPA 9020B		1	951531	PAG	ALS MTown	02/21/23 18:12

Client Sample ID: NBKK-IDW13-AQ-012523
Lab Sample ID: 410-113811-3

Date Collected: 01/25/23 13:30
Matrix: Water
Date 7 ecei9ed: 01/2T/23 0y:40
Rercent Solidv: 0

Rrep Pspe	Batch Pspe	Batch Method	7un	Dilution Factor	Batch Number	Analsvt	Lab	Rrepared or Analszed
Total/NA	Prep	NA		1	951531_P		ALS MTown	02/21/23 18:12
Total/NA	Analysis	EPA 9020B		1	951531	PAG	ALS MTown	02/21/23 18:12

Client Sample ID: NBKK-IDW14-AQ-012523
Lab Sample ID: 410-113811-4

Date Collected: 01/25/23 13:45
Matrix: Water
Date 7 ecei9ed: 01/2T/23 0y:40
Rercent Solidv: 0

Rrep Pspe	Batch Pspe	Batch Method	7un	Dilution Factor	Batch Number	Analsvt	Lab	Rrepared or Analszed
Total/NA	Prep	NA		1	951531_P		ALS MTown	02/21/23 18:12
Total/NA	Analysis	EPA 9020B		1	951531	PAG	ALS MTown	02/21/23 18:12

Client Sample ID: NBKK-IDW15-AQ-012523
Lab Sample ID: 410-113811-5

Date Collected: 01/25/23 12:45
Matrix: Water
Date 7 ecei9ed: 01/2T/23 0y:40
Rercent Solidv: 0

Rrep Pspe	Batch Pspe	Batch Method	7un	Dilution Factor	Batch Number	Analsvt	Lab	Rrepared or Analszed
Total/NA	Prep	NA		1	951531_P		ALS MTown	02/21/23 18:12
Total/NA	Analysis	EPA 9020B		1	951531	PAG	ALS MTown	02/21/23 18:12

Lab Chronicle

Client: Jacobs Engineering Group, Inc.
Project/Site: CTO-4117 NBK Keyport

Job ID: 410-113811-2
SDG: NBK Keyport

Client Sample ID: NBKK-IDW16-AQ-012523
Lab Sample ID: 410-113811-6

Date Collected: 01/25/23 12:30
Matrix: Water
Date 7 ecei9ed: 01/2T/23 0y:40
Rercent Solidv: 0

Rrep Pspe	Batch Pspe	Batch Method	7un	Dilution Factor	Batch Number	Analsvt	Lab	Rrepared or Analszed
Total/NA	Prep	NA		1	951531_P		ALS MTown	02/21/23 18:12
Total/NA	Analysis	EPA 9020B		1	951531	PAG	ALS MTown	02/21/23 18:12

Client Sample ID: NBKK-IDW1T-AQ-012523
Lab Sample ID: 410-113811-T

Date Collected: 01/25/23 12:15
Matrix: Water
Date 7 ecei9ed: 01/2T/23 0y:40
Rercent Solidv: 0

Rrep Pspe	Batch Pspe	Batch Method	7un	Dilution Factor	Batch Number	Analsvt	Lab	Rrepared or Analszed
Total/NA	Prep	NA		1	951531_P		ALS MTown	02/21/23 18:12
Total/NA	Analysis	EPA 9020B		1	951531	PAG	ALS MTown	02/21/23 18:12

Client Sample ID: NBKK-IDW18-AQ-012523
Lab Sample ID: 410-113811-8

Date Collected: 01/25/23 12:00
Matrix: Water
Date 7 ecei9ed: 01/2T/23 0y:40
Rercent Solidv: 0

Rrep Pspe	Batch Pspe	Batch Method	7un	Dilution Factor	Batch Number	Analsvt	Lab	Rrepared or Analszed
Total/NA	Prep	NA		1	951531_P		ALS MTown	02/21/23 18:12
Total/NA	Analysis	EPA 9020B		1	951531	PAG	ALS MTown	02/21/23 18:12

Client Sample ID: NBKK-IDW1y-AQ-012523
Lab Sample ID: 410-113811-y

Date Collected: 01/25/23 11:45
Matrix: Water
Date 7 ecei9ed: 01/2T/23 0y:40
Rercent Solidv: 0

Rrep Pspe	Batch Pspe	Batch Method	7un	Dilution Factor	Batch Number	Analsvt	Lab	Rrepared or Analszed
Total/NA	Prep	NA		1	952077_P		ALS MTown	02/22/23 17:35
Total/NA	Analysis	EPA 9020B		1	952077	PAG	ALS MTown	02/22/23 17:35

Client Sample ID: NBKK-IDW20-AQ-012523
Lab Sample ID: 410-113811-10

Date Collected: 01/25/23 11:20
Matrix: Water
Date 7 ecei9ed: 01/2T/23 0y:40
Rercent Solidv: 0

Rrep Pspe	Batch Pspe	Batch Method	7un	Dilution Factor	Batch Number	Analsvt	Lab	Rrepared or Analszed
Total/NA	Prep	NA		1	952077_P		ALS MTown	02/22/23 17:35
Total/NA	Analysis	EPA 9020B		1	952077	PAG	ALS MTown	02/22/23 17:35

Laborators 7 eferencev:
ALS MTown = ALS Environmental - Middletown, PA, 301 Fulling Mill Road, Middletown, PA 17057

Method Summary

Client: Jacobs Engineering Group, Inc.
Project/Site: CTO-4117 NBK Keyport

Job ID: 410-113811-2
SDG: NBK Keyport

Method	Method Description	Protocol	Laboratory
9020B	EPA 9020B TOX	SW846	ALS MTown

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

ALS MTown = ALS Environmental - Middletown, PA, 301 Fulling Mill Road, Middletown, PA 17057

Sample Summary

Client: Jacobs Engineering Group, Inc.
j ro/ectTNite: CO7 -411WBKy y ePport

Job ID: 410-113811-S
NDG: BKy y ePport

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
410-113811-1	BKy y -IDA 11-Q2 -01S5S3	A ater	01TS5TS3 13:00	01TSWTS3 09:40
410-113811-S	BKy y -IDA 1S-Q2 -01S5S3	A ater	01TS5TS3 13:15	01TSWTS3 09:40
410-113811-3	BKy y -IDA 13-Q2 -01S5S3	A ater	01TS5TS3 13:30	01TSWTS3 09:40
410-113811-4	BKy y -IDA 14-Q2 -01S5S3	A ater	01TS5TS3 13:45	01TSWTS3 09:40
410-113811-5	BKy y -IDA 15-Q2 -01S5S3	A ater	01TS5TS3 1S:45	01TSWTS3 09:40
410-113811-6	BKy y -IDA 16-Q2 -01S5S3	A ater	01TS5TS3 1S:30	01TSWTS3 09:40
410-113811-W	BKy y -IDA 1W-Q2 -01S5S3	A ater	01TS5TS3 1S:15	01TSWTS3 09:40
410-113811-8	BKy y -IDA 18-Q2 -01S5S3	A ater	01TS5TS3 1S:00	01TSWTS3 09:40
410-113811-9	BKy y -IDA 19-Q2 -01S5S3	A ater	01TS5TS3 11:45	01TSWTS3 09:40
410-113811-10	BKy y -IDA S0-Q2 -01S5S3	A ater	01TS5TS3 11:S0	01TSWTS3 09:40

301 Fulling Mill Road | Middletown, PA 17057 | Phone: 717-944-5541 | Fax: 717-944-1430 | www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

Analptisal Re8ult8 Re/ ojt Foj	**Eurofins Lancaster Laboratories Environmental, LLC**
	Pjoyest: 666119|410-113211-1
	k ojcojdej: 3W259r 4
	Re/ ojt DE: WW73r on WW3IW0W3

Certificate of Analysis

f nslo8ed aje the analptisal je8ult8 moj 8av / le8 jeseibed Np the laNojatojp on FeN 0W, W0W3.

The A6L f nbijonv ental laNojatojp in Middletown, Penn8plbania i8 a Sational f nbijonv ental 6aNojatojp Assjeditation Pjogjav (Sf 6AP) assjedited laNojatojp and a8 8ush, sejtirie8 that all a/ / lisaNle te8t je8ult8 v eet the jequijev ent8 om Sf 6AP.

Dm pou habe anp que8tion8 jegajding thi8 sejtirisate om analp8i8, / lea8e sontast Lajah 6eung (Pjoyest Coojdinatoj) at (717) 944-5541.

Analp8e8 weje / ejmojv ed assojding to ouj laNojatojp'8 Sf 6AP-a/ / jobed qualitp a88ujanse / jogjav and anp a/ / lisaNle 8tate jequijev ent8. The te8t je8ult8 v eet jequijev ent8 om the sujjent Sf 6AP 8tandajd8 oj 8tate jequijev ent8, wheje a/ / lisaNle. Foj a 8/ esiris li8t om assjedited analpte8, jemej to the sejtirisation8 8estion om the A6L weN8ite at www.al8gloNal.sov lenlOuj-Lejbise8l6im-Lsiense8lf nbijonv entallEownload8.

Thi8 laNojatojp je/ ojt v ap not Ne je/ jodused, exse/ t in mll, without the wjitten a/ / jobal om A6L GloNal.
A6L Middletown: 301 Fulling Mill Road, Middletown, PA 17057 : 717-944-5541.

Resi/ ient(8):
f SV LuNsontjasting - 6ansa8tej 6aNojatojie8

Sarah Leung

Sarah Leung *(ALS Digital Signature)*
Pjoyest Coojdinatoj

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Sample Summary

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collector	Collection Company
3285964001	NBKK-IDW11-AQ-012523	Water	01/25/2023 13:00	02/02/2023 13:48	CBC	Collected By Client
3285964002	NBKK-IDW12-AQ-012523	Water	01/25/2023 13:15	02/02/2023 13:48	CBC	Collected By Client
3285964003	NBKK-IDW13-AQ-012523	Water	01/25/2023 13:30	02/02/2023 13:48	CBC	Collected By Client
3285964004	NBKK-IDW14-AQ-012523	Water	01/25/2023 13:45	02/02/2023 13:48	CBC	Collected By Client
3285964005	NBKK-IDW15-AQ-012523	Water	01/25/2023 12:45	02/02/2023 13:48	CBC	Collected By Client
3285964006	NBKK-IDW16-AQ-012523	Water	01/25/2023 12:30	02/02/2023 13:48	CBC	Collected By Client
3285964007	NBKK-IDW17-AQ-012523	Water	01/25/2023 12:15	02/02/2023 13:48	CBC	Collected By Client
3285964008	NBKK-IDW18-AQ-012523	Water	01/25/2023 12:00	02/02/2023 13:48	CBC	Collected By Client
3285964009	NBKK-IDW19-AQ-012523	Water	01/25/2023 11:45	02/02/2023 13:48	CBC	Collected By Client
3285964010	NBKK-IDW20-AQ-012523	Water	01/25/2023 11:20	02/02/2023 13:48	CBC	Collected By Client

Reference

Notes

- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
- Except as qualified, Clean Water Act sample analyses are consistent with methodology requirements in 40 CFR Part 136.
- Except as qualified, Safe Drinking Water Act sample analyses are consistent with methodology requirements in 40 CFR Part 141.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
- Method references listed on this report beginning with the prefix “S” followed by a method number (such as S2310B-97) refer to methods from “Standard Methods for the Examination of Water and Wastewater”.
- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND) above the MDL
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Practical Quantitation Limit for this Project
ND	Not Detected - indicates that the analyte was Not Detected
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits
#	Please reference the result in the Results Section for analyte-level flags.

Project Notations

Sample Notations

Lab ID	Sample ID

Result Notations

Notation Ref.

Detected Results Summary

Client Sample ID	NBKK-IDW11-AQ-012523	Collected	01/25/2023 13:00
Lab Sample ID	3285964001	Lab Receipt	02/02/2023 13:48

Compound	Result	Units	LOQ	LOD	DL	Method	Flag
WET CHEMISTRY							
Halogen, Total Organic (TOX)	14.9J	ug/L	20.0	16.0	7.8	SW846 9020B	#

Detected Results Summary

Client Sample ID	NBKK-IDW15-AQ-012523	Collected	01/25/2023 12:45
Lab Sample ID	3285964005	Lab Receipt	02/02/2023 13:48

Compound	Result	Units	LOQ	LOD	DL	Method	Flag
WET CHEMISTRY							
Halogen, Total Organic (TOX)	15.4J	ug/L	20.0	16.0	7.8	SW846 9020B	#

Detected Results Summary

Client Sample ID	NBKK-IDW16-AQ-012523	Collected	01/25/2023 12:30
Lab Sample ID	3285964006	Lab Receipt	02/02/2023 13:48

Compound	Result	Units	LOQ	LOD	DL	Method	Flag
WET CHEMISTRY							
Halogen, Total Organic (TOX)	205	ug/L	20.0	16.0	7.8	SW846 9020B	#

Detected Results Summary

Client Sample ID	NBKK-IDW18-AQ-012523	Collected	01/25/2023 12:00
Lab Sample ID	3285964008	Lab Receipt	02/02/2023 13:48

Compound	Result	Units	LOQ	LOD	DL	Method	Flag
WET CHEMISTRY							
Halogen, Total Organic (TOX)	21.6	ug/L	20.0	16.0	7.8	SW846 9020B	#

Detected Results Summary

Client Sample ID	NBKK-IDW19-AQ-012523	Collected	01/25/2023 11:45
Lab Sample ID	3285964009	Lab Receipt	02/02/2023 13:48

Compound	Result	Units	LOQ	LOD	DL	Method	Flag
WET CHEMISTRY							
Halogen, Total Organic (TOX)	36.2	ug/L	20.0	16.0	7.8	SW846 9020B	#

Detected Results Summary

Client Sample ID	NBKK-IDW20-AQ-012523	Collected	01/25/2023 11:20
Lab Sample ID	3285964010	Lab Receipt	02/02/2023 13:48

Compound	Result	Units	LOQ	LOD	DL	Method	Flag
WET CHEMISTRY							
Halogen, Total Organic (TOX)	223	ug/L	20.0	16.0	7.8	SW846 9020B	#

Results

Client Sample ID	NBKK-IDW11-AQ-012523	Collected	01/25/2023 13:00
Lab Sample ID	3285964001	Lab Receipt	02/02/2023 13:48

WET CHEMISTRY

Compound	Result	Flag	Units	LOQ	LOD	DL	Method	Dilution	Analysis Date/Time	By	Cntr
Halogen, Total Organic (TOX)	14.9J	J	ug/L	20.0	16.0	7.8	SW846 9020B	1	02/21/2023 18:12	PAG	A

Results

Client Sample ID	NBKK-IDW12-AQ-012523	Collected	01/25/2023 13:15
Lab Sample ID	3285964002	Lab Receipt	02/02/2023 13:48

WET CHEMISTRY

Compound	Result	Flag	Units	LOQ	LOD	DL	Method	Dilution	Analysis Date/Time	By	Cntr
Halogen, Total Organic (TOX)	16.0U	U	ug/L	20.0	16.0	7.8	SW846 9020B	1	02/21/2023 18:12	PAG	A

Results

Client Sample ID	NBKK-IDW13-AQ-012523	Collected	01/25/2023 13:30
Lab Sample ID	3285964003	Lab Receipt	02/02/2023 13:48

WET CHEMISTRY

Compound	Result	Flag	Units	LOQ	LOD	DL	Method	Dilution	Analysis Date/Time	By	Cntr
Halogen, Total Organic (TOX)	16.0U	U	ug/L	20.0	16.0	7.8	SW846 9020B	1	02/21/2023 18:12	PAG	A

Results

Client Sample ID	NBKK-IDW14-AQ-012523	Collected	01/25/2023 13:45
Lab Sample ID	3285964004	Lab Receipt	02/02/2023 13:48

WET CHEMISTRY

Compound	Result	Flag	Units	LOQ	LOD	DL	Method	Dilution	Analysis Date/Time	By	Cntr
Halogen, Total Organic (TOX)	16.0U	U	ug/L	20.0	16.0	7.8	SW846 9020B	1	02/21/2023 18:12	PAG	A

Results

Client Sample ID	NBKK-IDW15-AQ-012523	Collected	01/25/2023 12:45
Lab Sample ID	3285964005	Lab Receipt	02/02/2023 13:48

WET CHEMISTRY

Compound	Result	Flag	Units	LOQ	LOD	DL	Method	Dilution	Analysis Date/Time	By	Cntr
Halogen, Total Organic (TOX)	15.4J	J	ug/L	20.0	16.0	7.8	SW846 9020B	1	02/21/2023 18:12	PAG	A

Results

Client Sample ID	NBKK-IDW16-AQ-012523	Collected	01/25/2023 12:30
Lab Sample ID	3285964006	Lab Receipt	02/02/2023 13:48

WET CHEMISTRY

Compound	Result	Flag	Units	LOQ	LOD	DL	Method	Dilution	Analysis Date/Time	By	Cntr
Halogen, Total Organic (TOX)	205		ug/L	20.0	16.0	7.8	SW846 9020B	1	02/21/2023 18:12	PAG	A

Results

Client Sample ID	NBKK-IDW17-AQ-012523	Collected	01/25/2023 12:15
Lab Sample ID	3285964007	Lab Receipt	02/02/2023 13:48

WET CHEMISTRY

Compound	Result	Flag	Units	LOQ	LOD	DL	Method	Dilution	Analysis Date/Time	By	Cntr
Halogen, Total Organic (TOX)	16.0U	U	ug/L	20.0	16.0	7.8	SW846 9020B	1	02/21/2023 18:12	PAG	A

Results

Client Sample ID	NBKK-IDW18-AQ-012523	Collected	01/25/2023 12:00
Lab Sample ID	3285964008	Lab Receipt	02/02/2023 13:48

WET CHEMISTRY

Compound	Result	Flag	Units	LOQ	LOD	DL	Method	Dilution	Analysis Date/Time	By	Cntr
Halogen, Total Organic (TOX)	21.6		ug/L	20.0	16.0	7.8	SW846 9020B	1	02/21/2023 18:12	PAG	A

Results

Client Sample ID	NBKK-IDW19-AQ-012523	Collected	01/25/2023 11:45
Lab Sample ID	3285964009	Lab Receipt	02/02/2023 13:48

WET CHEMISTRY

Compound	Result	Flag	Units	LOQ	LOD	DL	Method	Dilution	Analysis Date/Time	By	Cntr
Halogen, Total Organic (TOX)	36.2		ug/L	20.0	16.0	7.8	SW846 9020B	1	02/22/2023 17:35	PAG	A

Results

Client Sample ID	NBKK-IDW20-AQ-012523	Collected	01/25/2023 11:20
Lab Sample ID	3285964010	Lab Receipt	02/02/2023 13:48

WET CHEMISTRY

Compound	Result	Flag	Units	LOQ	LOD	DL	Method	Dilution	Analysis Date/Time	By	Cntr
Halogen, Total Organic (TOX)	223		ug/L	20.0	16.0	7.8	SW846 9020B	1	02/22/2023 17:35	PAG	A

Sample - Method Cross Reference Table

Lab ID	Sample ID	Analysis Method	Preparation Method	Leachate Method
3285964001	NBKK-IDW11-AQ-012523	SW846 9020B	N/A	
3285964002	NBKK-IDW12-AQ-012523	SW846 9020B	N/A	
3285964003	NBKK-IDW13-AQ-012523	SW846 9020B	N/A	
3285964004	NBKK-IDW14-AQ-012523	SW846 9020B	N/A	
3285964005	NBKK-IDW15-AQ-012523	SW846 9020B	N/A	
3285964006	NBKK-IDW16-AQ-012523	SW846 9020B	N/A	
3285964007	NBKK-IDW17-AQ-012523	SW846 9020B	N/A	
3285964008	NBKK-IDW18-AQ-012523	SW846 9020B	N/A	
3285964009	NBKK-IDW19-AQ-012523	SW846 9020B	N/A	
3285964010	NBKK-IDW20-AQ-012523	SW846 9020B	N/A	

QUALITY CONTROL SAMPLES

WET CHEMISTRY

QC Batch

QC Batch	951531	Prep Method	N/A
Date	N/A	Analysis Method	SW846 9020B
Tech.			

Associated Samples

3285964001	3285964002	3285964003	3285964004
3285964005	3285964006	3285964007	3285964008

Method Blank 3628302 (MB) Created on 02/21/2023 16:01 For QC Batch 951531

RESULTS

Compound	CAS No		Result	Units	LOQ	Qualifiers
Halogen, Total Organic (TOX)	TOX	BLK	8.0U	ug/L	10.0	U

Matrix Spike 3628414 (MS) 3285964002 For QC Batch 951531

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Matrix Spike Duplicate 3628415 (MSD) 3285964002 For QC Batch 951531

RESULTS

Compound	CAS No		Result (ug/L)	Orig. Result (ug/L)	Spk Added (ug/L)	Rec. (%)	Limits (%)	RPD Limit (%)	Qualifiers
Halogen, Total Organic (TOX)	TOX	MS	207	0.36	200	103	80 - 120		
Halogen, Total Organic (TOX)	TOX	MSD	201	0.36	200	100	80 - 120	RPD 2.99 (Max-20)	

QC Batch

QC Batch	952077	Prep Method	N/A
Date	N/A	Analysis Method	SW846 9020B
Tech.			

Associated Samples

3285964009	3285964010

Method Blank 3628878 (MB) Created on 02/22/2023 11:30 For QC Batch 952077

RESULTS

Compound	CAS No		Result	Units	LOQ	Qualifiers
Halogen, Total Organic (TOX)	TOX	BLK	8.0U	ug/L	10.0	U

Matrix Spike 3629091 (MS) 3285964009 For QC Batch 952077

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

Matrix Spike Duplicate 3629092 (MSD) 3285964009 For QC Batch 952077

QUALITY CONTROL SAMPLES

WET CHEMISTRY (cont.)

RESULTS

Compound	CAS No		Result (ug/L)	Orig. Result (ug/L)	Spk Added (ug/L)	Rec. (%)	Limits (%)	RPD Limit (%)	Qualifiers
Halogen, Total Organic (TOX)	TOX	MS	214	36.20	200	88.9	80 - 120		
Halogen, Total Organic (TOX)	TOX	MSD	228	36.20	200	95.8	80 - 120	RPD 6.27 (Max-20)	

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Lab ID	Sample ID	Areparayi Mt eyhi o	Arep dayPh	Arep Daye32sme dc	r Malc8s8 t eyhi o	r Mc dayPh
596401NBBK	- dWWQD/ KKQ7 GBK9495	- 3	- 3	- 3	S/ 6N1 0B9Bd	04K45K
596401NBB9	- dWWQD/ K9Q7 GBK9495	- 3	- 3	- 3	S/ 6N1 0B9Bd	04K45K
596401NBB5	- dWWQD/ K5Q7 GBK9495	- 3	- 3	- 3	S/ 6N1 0B9Bd	04K45K
596401NBBN	- dWWQD/ KNQ7 GBK9495	- 3	- 3	- 3	S/ 6N1 0B9Bd	04K45K
596401NBB4	- dWWQD/ K4Q7 GBK9495	- 3	- 3	- 3	S/ 6N1 0B9Bd	04K45K
596401NBB1	- dWWQD/ K1Q7 GBK9495	- 3	- 3	- 3	S/ 6N1 0B9Bd	04K45K
596401NBBf	- dWWQD/ KfQ7 GBK9495	- 3	- 3	- 3	S/ 6N1 0B9Bd	04K45K
596401NBB6	- dWWQD/ K6Q7 GBK9495	- 3	- 3	- 3	S/ 6N1 0B9Bd	04K45K
596401NBB0	- dWWQD/ K0Q7 GBK9495	- 3	- 3	- 3	S/ 6N1 0B9Bd	049Bf f
596401NBKB	- dWWQD/ 9BQ7 GBK9495	- 3	- 3	- 3	S/ 6N1 0B9Bd	049Bf f

Eurofins Lancaster Laboratories Environme
2425 New Holland Pike
Lancaster, PA 17601
Phone: 717-656-2300 Fax: 717-656-2681

Chain of Custody Record

3285964
Logged By: SLS
PM: SSL

3285964

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Martin, Elizabeth	COC No: 410-1914592.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Elizabeth.Martin@et.eurofinsus.com	State of Origin: Washington	Page: Page 1 of 2
Company: ALS Environmental		Accreditations Required (See note): Dept. of Defense ELAP - A2LA; State - Washington	Job #: 410-113811-1
Address: 301 Fulling Mill Road, ,	Due Date Requested: 2/11/2023		
City: Middletown	TAT Requested (days):		
State, Zip: PA, 17057			
Phone:	PO #:		
Email:	WO #:		
Project Name: OU1 at NBK Keyport (RFP) 22-0773	Project #: 41012633		
Site:	SSOW#:		

Analysis Requested

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)
Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	SUB (Total Organic Halogens - 12-day TAT)/ EPA 9020B (8/H2SO4)	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
NBKK-IDW11-AQ-012523 (410-113811-1)	1/25/23	13:00 Pacific		Water			X	1	See Attached Instructions
NBKK-IDW12-AQ-012523 (410-113811-2)	1/25/23	13:15 Pacific		Water			X	1	See Attached Instructions
NBKK-IDW13-AQ-012523 (410-113811-3)	1/25/23	13:30 Pacific		Water			X	1	See Attached Instructions
NBKK-IDW14-AQ-012523 (410-113811-4)	1/25/23	13:45 Pacific		Water			X	1	See Attached Instructions
NBKK-IDW15-AQ-012523 (410-113811-5)	1/25/23	12:45 Pacific		Water			X	1	See Attached Instructions
NBKK-IDW16-AQ-012523 (410-113811-6)	1/25/23	12:30 Pacific		Water			X	1	See Attached Instructions
NBKK-IDW17-AQ-012523 (410-113811-7)	1/25/23	12:15 Pacific		Water			X	1	See Attached Instructions
NBKK-IDW18-AQ-012523 (410-113811-8)	1/25/23	12:00 Pacific		Water			X	1	See Attached Instructions
NBKK-IDW19-AQ-012523 (410-113811-9)	1/25/23	11:45 Pacific		Water			X	1	See Attached Instructions

Temp By: K98 | WO Temp (°C): 0 | Therm ID: 573

Receipt Info Completed By: AWF
Cooler Custody Seal Intact: Y N (NA)
Sample Custody Seal Intact: Y N (NA)
Received on Ice: (Y) N NA
Cooler & Samples Intact: (Y) N
Correct Containers Provided: (Y) N
Sample Label/COC Agree: (Y) N
Adequate Sample Volumes: (Y) N
CR6 Samples Filtered: Y N (NA)
OP Samples Filtered: Y N (NA)
VOA Headspace Present: Y N (NA)
Voa Trip Blank: Y N (NA)
NJ≤ 4 Days? Y N
Rad Screen (uCi):
Courier/Tracking #:
SDWA Compliance: Y (N)
PWSID:
WV Containers 0-6°C: Y N (NA)
No Comp/ GRAB

Note: Since laboratory accreditations are subject to change, Eurofins Lancaster Laboratories Environment Testing, LLC places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Lancaster Laboratories Environment Testing, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Lancaster Laboratories Environment Testing, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Lancaster Laboratories Environment Testing, LLC.

Possible Hazard Identification	***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)***
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	Emily Higgins	2/1/23 14:36	ELLE		2/2/23 12:50	ELLE
2		2/2/23 13:48	ELLE		2.2.23 1848	
3						

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:
		0° 573

3285964

Ver: 06/08/2021

3285964

Eurofins Lancaster Laboratories Environme
2425 New Holland Pike
Lancaster, PA 17601
Phone: 717-656-2300 Fax: 717-656-2681

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Martin, Elizabeth	Carrier Tracking No(s):	COC No: 410-1914592.2
Client Contact: Shipping/Receiving	Phone:	E-Mail: Elizabeth.Martin@et.eurofinsus.com	State of Origin: Washington	Page: Page 2 of 2
Company: ALS Environmental		Accreditations Required (See note): Dept. of Defense ELAP - A2LA; State - Washington		Job #: 410-113811-1
Address: 301 Fulling Mill Road, ,	Due Date Requested: 2/11/2023			
City: Middletown	TAT Requested (days):			
State, Zip: PA, 17057				
Phone:	PO #:			
Email:	WO #:			
Project Name: OU1 at NBK Keyport (RFP) 22-0773	Project #: 41012633			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	SUB (Total Organic Halogens - 12-day TAT)/ EPA 9020B (CA/H2SO4)	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
NBKK-IDW20-AQ-012523 (410-113811-10)	1/25/23	11:20 Pacific		Water			X	1	See Attached Instructions

Note: Since laboratory accreditations are subject to change, Eurofins Lancaster Laboratories Environment Testing, LLC places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Lancaster Laboratories Environment Testing, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Lancaster Laboratories Environment Testing, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Lancaster Laboratories Environment Testing, LLC.

Possible Hazard Identification *Unconfirmed*	***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For _____ Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by: Emily Krogin	Date/Time: 2/1/23 14:36	Company ELLE	Received by:	Date/Time: 2/2/23 1250	Company ELLE
Relinquished by:	Date/Time: 2/2/23 13:48	Company ELLE	Received by:	Date/Time: 2.2.23 1348	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 06/08/2021

410-113811 Chain of Custody

Chain of Custody Record

eurofins Environment Testing America

Client Information	Sampler: Tim Anderson	Lab PM: Dutton, Tracy L	Carrier Tracking No(s):	COC No: 580-48044-15408.1
Client Contact: Gail DeRuzzo	Phone: 702 686 7448	E-Mail: Tracy.Dutton@et.eurofinsus.com	State of Origin: WA	Page: Page
Company: Battelle	PWSID:			Job #: 704 758 CH

Field	Value
Address	PO BOX 84262
City	Seattle
State, Zip	WA, 98124-5562
Phone	
Email	deruzzo@battelle.org
Project Name	OU1 at NBK Keyport (RFP) 22-0773
Site	NBK Keyport
Due Date Requested	
TAT Requested (days)	
Compliance Project	Δ Yes Δ No
PO #	Purchase Order Requested
WO #	
Project #	58017858
SSOW#	

Analysis Requested

Columns: Field Filtered Sample (Yes or No); Perform MS/MSD (Yes or No); ~~Moisture - Local Method~~ (N); ~~8260D_DODE - eVOCs - Chloroethane~~ (J); ~~8270E_SIM - OD - 1,4-Dioxane~~ SIM DOD (N); ~~9060A - TOC~~ 8082A_DOD5, 8082A-DOD5 (N); ~~1658...~~ 9012 Reactive (N); ~~8082A...~~ 9034 Reactive (N); ~~8260D_DODE - Volatiles (Standard list)~~ (A); 1010-Ignitability, 9040C pH/Corrosive; 7470A - DOD5, 6020B - DOD5; NWTPH-Dx; NWTPH-Gx; Total Number of containers

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered	MS/MSD	Moisture	8260D	SIM DOD	8082A	9012 Reactive	9034 Reactive	8260D Volatiles	1010/9040C	7470A/6020B	NWTPH-Dx	NWTPH-Gx	Total Number of containers	Special Instructions/Note
			Preservation Code:				N	J	N	N	N	N	A						
NBKK-IDW11-AQ-012523	1-25-23	1300	G	W	N	N			X	X	X	X		X	X	X	X		
NBKK-IDW12-AQ-012523		1315							X	X	X	X		X	X	X	X		
NBKK-IDW13-AQ-012523		1330							X	X	X	X		X	X	X	X		
NBKK-IDW14-AQ-012523		1345							X	X	X	X		X	X	X	X		
NBKK-IDW15-AQ-012523		1245							X	X	X	X		X	X	X	X		
NBKK-IDW16-AQ-012523		1230							X	X	X	X		X	X	X	X		
NBKK-IDW17-AQ-012523		1215							X	X	X	X		X	X	X	X		
NBKK-IDW18-AQ-012523		1200							X	X	X	X		X	X	X	X		
NBKK-IDW19-AQ-012523		1145							X	X	X	X		X	X	X	X		
NBKK-IDW20-AQ-012523		~~1120~~ 1130							X	X	X	X		X	X	X	X		

Preservation Codes: A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Other:

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
Tim Anderson	1-26-23	Jacobs			
				1/27/23 09:40	ELLET

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: 1.1-3.8

Ver: 01/16/2019

3/12/2023

Login Sample Receipt Checklist

Client: Jacobs Engineering Group, Inc.

Job Number: 410-113811-2
SDG Number: NBK Keyport

Login Number: 113811
List Number: 1
Creator: Renner, Melissa

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC

Question	Answer	Comment
The cooler's custody seal is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable (</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	False	Refer to Job Narrative for details.
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	True	
Sample custody seals are intact.	True	
VOA sample vials do not have headspace >6mm in diameter (none, if from WV)?	True	

eurofins | Environment Testing

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

ANALYTICAL REPORT

PREPARED FOR

Attn: Juan Acaron
Jacobs Engineering Group, Inc.
3011 SW Willston Road
Gainesville Florida 32608-3964

Generated 11/18/2022 5:12:30 PM

JOB DESCRIPTION

NBK Keyport

JOB NUMBER

410-103777-1

Eurofins Lancaster Laboratories Environment Testing, LLC
2425 New Holland Pike
Lancaster PA 17601

myEOL

Table of Contents

Qualifiers

GC/MS SeV i OAc

Qualifier	Qualifier Desprintion
J	Estimated: The analyte was positively identified; the quantitation is an estimation
M	Manual integrated compound.
U	Undetected at the Limit of Detection.

GC OAc

Qualifier	Qualifier Desprintion
J	Estimated: The analyte was positively identified; the quantitation is an estimation
M	Manual integrated compound.
U	Undetected at the Limit of Detection.

GC SeV i OAc

Qualifier	Qualifier Desprintion
M	Manual integrated compound.
U	Undetected at the Limit of Detection.

Metals

Qualifier	Qualifier Desprintion
J	Estimated: The analyte was positively identified; the quantitation is an estimation
U	Undetected at the Limit of Detection.

General CheV istry

Qualifier	Qualifier Desprintion
HF	Field parameter with a holding time of 15 minutes. Test performed by laboratory at client's request.
U	Undetected at the Limit of Detection.

Glossary

c bbreviation	These poV V only used abbreviations V ay or V ay not be rresent in this renort.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
1C	Result is from the primary column on a dual-column method.
2C	Result is from the confirmation column on a dual-column method.
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive

Glossary (Continued)

Abbreviation	These abbreviations are only used in this report.
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 410-103777-1

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC

Narrative

Job Narrative
410-103777-1

Receipt
The sample was received on 10/29/2022 10:00 AM. Unless otherwise noted below, the sample arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 0.9°C.

GC/MS Semi VOA
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

GC VOA
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

GC Semi VOA
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

PCBs
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Metals
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Detection Summary

Client: Jacobs Engineering Group, Inc.
Project/Site: NBK Keyport

Job ID: 410-103777-1

Client Sample ID: NBKK-IDW04-AQ-102722 — Lab Sample ID: 410-103777-1

Analyte	Result	Qualifier	LOQ	DL	Unit	Dil Fac	D	Method	Prep Type
Fluoranthene	0.019	J	0.051	0.010	ug/L	1		8270E SIM	Total/NA
Pyrene	0.014	J	0.051	0.010	ug/L	1		8270E SIM	Total/NA
C7-C12 (1C)	80	J M	250	43	ug/L	1		NWTPH-Gx	Total/NA
C12-C24	130	M	100	46	ug/L	1		NWTPH-Dx	Total/NA
Arsenic	0.00076	J	0.0020	0.00068	mg/L	1		6020B	Total Recoverable
Barium	0.034		0.0020	0.00075	mg/L	1		6020B	Total Recoverable
Chromium	0.0042		0.0020	0.00033	mg/L	1		6020B	Total Recoverable
Copper	0.0019		0.0010	0.00036	mg/L	1		6020B	Total Recoverable
Lead	0.00087		0.00050	0.000071	mg/L	1		6020B	Total Recoverable
Nickel	0.0032		0.0015	0.00040	mg/L	1		6020B	Total Recoverable
Zinc	0.010	J	0.015	0.0040	mg/L	1		6020B	Total Recoverable
Flashpoint	>201		50.0	50.0	Degrees F	1		1010	Total/NA
pH	7.4	HF	0.01	0.01	S.U.	1		9040C	Total/NA
Corrosivity	No	HF	0.01	0.01	NONE	1		9040C	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: NBKK-IDW04-AQ-102722

Date Collected: 10/27/22 15:00
Date Received: 10/29/22 10:00

Lab Sample ID: 410-103777-1

Matrix: Water

Method: SW846 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.040	U	0.051	0.020	ug/L		11/03/22 15:25	11/04/22 16:36	1
2-Methylnaphthalene	0.040	U M	0.051	0.020	ug/L		11/03/22 15:25	11/04/22 16:36	1
Acenaphthene	0.030	U M	0.051	0.010	ug/L		11/03/22 15:25	11/04/22 16:36	1
Acenaphthylene	0.030	U	0.051	0.010	ug/L		11/03/22 15:25	11/04/22 16:36	1
Anthracene	0.030	U	0.051	0.010	ug/L		11/03/22 15:25	11/04/22 16:36	1
Benzo[a]anthracene	0.030	U	0.051	0.010	ug/L		11/03/22 15:25	11/04/22 16:36	1
Benzo[a]pyrene	0.030	U	0.051	0.010	ug/L		11/03/22 15:25	11/04/22 16:36	1
Benzo[b]fluoranthene	0.030	U M	0.051	0.010	ug/L		11/03/22 15:25	11/04/22 16:36	1
Benzo[g,h,i]perylene	0.030	U	0.051	0.010	ug/L		11/03/22 15:25	11/04/22 16:36	1
Benzo[k]fluoranthene	0.030	U M	0.051	0.010	ug/L		11/03/22 15:25	11/04/22 16:36	1
Chrysene	0.030	U	0.051	0.010	ug/L		11/03/22 15:25	11/04/22 16:36	1
Dibenz(a,h)anthracene	0.040	U	0.051	0.020	ug/L		11/03/22 15:25	11/04/22 16:36	1
Fluoranthene	**0.019**	**J**	0.051	0.010	ug/L		11/03/22 15:25	11/04/22 16:36	1
Fluorene	0.030	U	0.051	0.010	ug/L		11/03/22 15:25	11/04/22 16:36	1
Indeno[1,2,3-cd]pyrene	0.040	U	0.051	0.020	ug/L		11/03/22 15:25	11/04/22 16:36	1
Naphthalene	0.061	U	0.071	0.030	ug/L		11/03/22 15:25	11/04/22 16:36	1
Phenanthrene	0.061	U	0.071	0.030	ug/L		11/03/22 15:25	11/04/22 16:36	1
Pyrene	**0.014**	**J**	0.051	0.010	ug/L		11/03/22 15:25	11/04/22 16:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Benzo(a)pyrene-d12 (Surr)	*53*		*10 - 110*	*11/03/22 15:25*	*11/04/22 16:36*	*1*
Fluoranthene-d10 (Surr)	*77*		*47 - 128*	*11/03/22 15:25*	*11/04/22 16:36*	*1*
1-Methylnaphthalene-d10 (Surr)	*79*		*36 - 111*	*11/03/22 15:25*	*11/04/22 16:36*	*1*

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C7-C12 (1C)	**80**	**J M**	250	43	ug/L			11/09/22 15:51	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*99*		*50 - 150*		*11/09/22 15:51*	*1*

Method: SW846 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1016 (1C)	0.20	U	0.25	0.10	ug/L		11/02/22 08:05	11/03/22 12:17	1
PCB-1221 (1C)	0.20	U	0.25	0.10	ug/L		11/02/22 08:05	11/03/22 12:17	1
PCB-1232 (1C)	0.20	U	0.25	0.10	ug/L		11/02/22 08:05	11/03/22 12:17	1
PCB-1242 (1C)	0.20	U	0.25	0.10	ug/L		11/02/22 08:05	11/03/22 12:17	1
PCB-1248 (1C)	0.20	U M	0.25	0.10	ug/L		11/02/22 08:05	11/03/22 12:17	1
PCB-1254 (1C)	0.20	U M	0.25	0.079	ug/L		11/02/22 08:05	11/03/22 12:17	1
PCB-1260 (1C)	0.20	U M	0.25	0.079	ug/L		11/02/22 08:05	11/03/22 12:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl (Surr) (1C)	*23*		*10 - 148*	*11/02/22 08:05*	*11/03/22 12:17*	*1*
DCB Decachlorobiphenyl (Surr) (2C)	*26*		*10 - 148*	*11/02/22 08:05*	*11/03/22 12:17*	*1*
Tetrachloro-m-xylene (1C)	*51*		*33 - 137*	*11/02/22 08:05*	*11/03/22 12:17*	*1*
Tetrachloro-m-xylene (2C)	*54*		*33 - 137*	*11/02/22 08:05*	*11/03/22 12:17*	*1*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C12-C24	**130**	**M**	100	46	ug/L		11/10/22 15:59	11/11/22 14:20	1
C24-C40	240	U M	250	100	ug/L		11/10/22 15:59	11/11/22 14:20	1

Client: Jacobs Engineering Group, Inc.
Project/Site: NBK Keyport

Job ID: 410-103777-1

Client Sample ID: NBKK-IDW04-AQ-102722

Date Collected: 10/27/22 15:00
Date Received: 10/29/22 10:00

Lab Sample ID: 410-103777-1

Matrix: Water

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o- terphenyl (Surr)	*85*		*50 - 150*	*11/10/22 15:59*	*11/11/22 14:20*	*1*

Method: SW846 6020B - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.00076**	**J**	0.0020	0.00068	mg/L		11/07/22 08:44	11/14/22 11:55	1
Barium	**0.034**		0.0020	0.00075	mg/L		11/07/22 08:44	11/14/22 11:55	1
Cadmium	0.00040	U	0.00050	0.00015	mg/L		11/07/22 08:44	11/14/22 11:55	1
Chromium	**0.0042**		0.0020	0.00033	mg/L		11/07/22 08:44	11/14/22 11:55	1
Copper	**0.0019**		0.0010	0.00036	mg/L		11/07/22 08:44	11/14/22 11:55	1
Lead	**0.00087**		0.00050	0.000071	mg/L		11/07/22 08:44	11/14/22 11:55	1
Nickel	**0.0032**		0.0015	0.00040	mg/L		11/07/22 08:44	11/14/22 11:55	1
Selenium	0.00060	U	0.0010	0.00028	mg/L		11/07/22 08:44	11/14/22 11:55	1
Silver	0.00030	U	0.00050	0.00010	mg/L		11/07/22 08:44	11/14/22 11:55	1
Zinc	**0.010**	**J**	0.015	0.0040	mg/L		11/07/22 08:44	11/14/22 11:55	1

Method: SW846 7470A - Mercury (CVAA)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.16	U	0.20	0.079	ug/L		11/04/22 08:02	11/04/22 15:57	1

General Chemistry

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Flashpoint (SW846 1010)	**>201**		50.0	50.0	Degrees F			11/03/22 08:36	1
Cyanide, Reactive (SW846 9012)	48	U	58	19	mg/Kg		11/14/22 08:11	11/14/22 14:23	1
Sulfide, Reactive (SW846 9034)	140	U	150	51	mg/Kg		11/14/22 08:11	11/14/22 12:41	1
pH (SW846 9040C)	**7.4**	**HF**	0.01	0.01	S.U.			11/01/22 17:35	1
Corrosivity (SW846 9040C)	**No**	**HF**	0.01	0.01	NONE			11/01/22 17:35	1

Surrogate Summary

Client: Jacobs Engineering Group, Inc.
Project/Site: NBK Keyport

Job ID: 410-103777-1

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)		
Lab Sample ID	Client Sample ID	BAPd12 (10-110)	FLN10 (47-128)	MNPd10 (36-111)
410-103777-1	NBKK-IDW04-AQ-102722	53	77	79
LCS 410-313674/2-A	Lab Control Sample	83	80	77
LCSD 410-313674/3-A	Lab Control Sample Dup	83	80	75
MB 410-313674/1-A	Method Blank	81	80	79

Surrogate Legend

BAPd12 = Benzo(a)pyrene-d12 (Surr)
FLN10 = Fluoranthene-d10 (Surr)
MNPd10 = 1-Methylnaphthalene-d10 (Surr)

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
Lab Sample ID	Client Sample ID	TFT-F1 (50-150)
410-103777-1	NBKK-IDW04-AQ-102722	99
LCS 410-315712/5	Lab Control Sample	91
LCSD 410-315712/6	Lab Control Sample Dup	89
MB 410-315712/4	Method Blank	99

Surrogate Legend

TFT-F = a,a,a-Trifluorotoluene (fid)

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
Lab Sample ID	Client Sample ID	DCB1 (10-148)	DCB2 (10-148)	TCX1 (33-137)	TCX2 (33-137)
410-103777-1	NBKK-IDW04-AQ-102722	23	26	51	54
LCS 410-313005/2-A	Lab Control Sample	43	50	62	68
LCSD 410-313005/3-A	Lab Control Sample Dup	39	48	68	74
MB 410-313005/1-A	Method Blank	64	75	66	72

Surrogate Legend

DCB = DCB Decachlorobiphenyl (Surr)
TCX = Tetrachloro-m-xylene

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Matrix: Water — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
Lab Sample ID	Client Sample ID	OTP (50-150)
410-103777-1	NBKK-IDW04-AQ-102722	85
LCS 410-316317/2-A	Lab Control Sample	85
LCSD 410-316317/3-A	Lab Control Sample Dup	73
MB 410-316317/1-A	Method Blank	77

Surrogate Legend

OTP = o- terphenyl (Surr)

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Lab Sample ID: MB 410-313674/1-A
Matrix: Water
Analysis Batch: 313853

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 313674

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	0.040	U M	0.050	0.020	ug/L		11/03/22 15:25	11/04/22 08:24	1
2-Methylnaphthalene	0.040	U	0.050	0.020	ug/L		11/03/22 15:25	11/04/22 08:24	1
Acenaphthene	0.030	U	0.050	0.010	ug/L		11/03/22 15:25	11/04/22 08:24	1
Acenaphthylene	0.030	U	0.050	0.010	ug/L		11/03/22 15:25	11/04/22 08:24	1
Anthracene	0.030	U M	0.050	0.010	ug/L		11/03/22 15:25	11/04/22 08:24	1
Benzo[a]anthracene	0.030	U	0.050	0.010	ug/L		11/03/22 15:25	11/04/22 08:24	1
Benzo[a]pyrene	0.030	U	0.050	0.010	ug/L		11/03/22 15:25	11/04/22 08:24	1
Benzo[b]fluoranthene	0.030	U	0.050	0.010	ug/L		11/03/22 15:25	11/04/22 08:24	1
Benzo[g,h,i]perylene	0.030	U	0.050	0.010	ug/L		11/03/22 15:25	11/04/22 08:24	1
Benzo[k]fluoranthene	0.030	U	0.050	0.010	ug/L		11/03/22 15:25	11/04/22 08:24	1
Chrysene	0.030	U	0.050	0.010	ug/L		11/03/22 15:25	11/04/22 08:24	1
Dibenz(a,h)anthracene	0.040	U	0.050	0.020	ug/L		11/03/22 15:25	11/04/22 08:24	1
Fluoranthene	0.030	U	0.050	0.010	ug/L		11/03/22 15:25	11/04/22 08:24	1
Fluorene	0.030	U	0.050	0.010	ug/L		11/03/22 15:25	11/04/22 08:24	1
Indeno[1,2,3-cd]pyrene	0.040	U	0.050	0.020	ug/L		11/03/22 15:25	11/04/22 08:24	1
Naphthalene	0.060	U	0.070	0.030	ug/L		11/03/22 15:25	11/04/22 08:24	1
Phenanthrene	0.060	U	0.070	0.030	ug/L		11/03/22 15:25	11/04/22 08:24	1
Pyrene	0.030	U	0.050	0.010	ug/L		11/03/22 15:25	11/04/22 08:24	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Benzo(a)pyrene-d12 (Surr)	*51*		*13 - 113*	*11/03/22 16:26*	*11/04/22 08:24*	*1*
Fluoranthene-d13 (Surr)	*53*		*17 - 125*	*11/03/22 16:26*	*11/04/22 08:24*	*1*
1-Methylnaphthalene-d13 (Surr)	*78*		*49 - 111*	*11/03/22 16:26*	*11/04/22 08:24*	*1*

Lab Sample ID: LCS 410-313674/2-A
Matrix: Water
Analysis Batch: 313853

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 313674

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1-Methylnaphthalene	1.00	0.805		ug/L		80	41 - 115
2-Methylnaphthalene	1.00	0.725		ug/L		72	39 - 114
Acenaphthene	1.00	0.800		ug/L		80	48 - 114
Acenaphthylene	1.00	0.842		ug/L		84	35 - 121
Anthracene	1.00	0.862		ug/L		86	53 - 119
Benzo[a]anthracene	1.00	0.901		ug/L		90	59 - 120
Benzo[a]pyrene	1.00	0.852		ug/L		85	53 - 120
Benzo[b]fluoranthene	1.00	0.833		ug/L		83	53 - 126
Benzo[g,h,i]perylene	1.00	0.687		ug/L		69	44 - 128
Benzo[k]fluoranthene	1.00	0.890		ug/L		89	54 - 125
Chrysene	1.00	0.869		ug/L		87	57 - 120
Dibenz(a,h)anthracene	1.00	0.689		ug/L		69	44 - 131
Fluoranthene	1.00	0.880		ug/L		88	58 - 120
Fluorene	1.00	0.802		ug/L		80	50 - 118
Indeno[1,2,3-cd]pyrene	1.00	0.713		ug/L		71	48 - 130
Naphthalene	1.00	0.838		ug/L		84	43 - 114
Phenanthrene	1.00	0.865		ug/L		86	53 - 115
Pyrene	1.00	0.804		ug/L		80	53 - 121

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

Lab Sample ID: LCS 410-313674/2-A
Matrix: Water
Analysis Batch: 313853

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 313674

Surrogate	LCS %Recovery	LCS Qualifier	Limits
Benzo(a)pyrene-d12 (Surr)	54		13 - 113
Fluoranthene-d13 (Surr)	53		/ 7 - 125
1-Methylnaphthalene-d13 (Surr)	77		49 - 111

Lab Sample ID: LCSD 410-313674/3-A
Matrix: Water
Analysis Batch: 313853

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 313674

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
1-Methylnaphthalene			1.00	0.713		ug/L		71	41 - 115	12	20
2-Methylnaphthalene			1.00	0.645		ug/L		64	39 - 114	12	20
Acenaphthene			1.00	0.740		ug/L		74	48 - 114	8	20
Acenaphthylene			1.00	0.787		ug/L		79	35 - 121	7	20
Anthracene			1.00	0.830		ug/L		83	53 - 119	4	20
Benzo[a]anthracene			1.00	0.844		ug/L		84	59 - 120	7	20
Benzo[a]pyrene			1.00	0.801		ug/L		80	53 - 120	6	20
Benzo[b]fluoranthene			1.00	0.818		ug/L		82	53 - 126	2	20
Benzo[g,h,i]perylene			1.00	0.668		ug/L		67	44 - 128	3	20
Benzo[k]fluoranthene			1.00	0.852		ug/L		85	54 - 125	4	20
Chrysene			1.00	0.797		ug/L		80	57 - 120	9	20
Dibenz(a,h)anthracene			1.00	0.645		ug/L		65	44 - 131	7	20
Fluoranthene			1.00	0.830		ug/L		83	58 - 120	6	20
Fluorene			1.00	0.780		ug/L		78	50 - 118	3	20
Indeno[1,2,3-cd]pyrene			1.00	0.666		ug/L		67	48 - 130	7	20
Naphthalene			1.00	0.734		ug/L		73	43 - 114	13	20
Phenanthrene			1.00	0.841		ug/L		84	53 - 115	3	20
Pyrene			1.00	0.752		ug/L		75	53 - 121	7	20

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
Benzo(a)pyrene-d12 (Surr)	54		13 - 113
Fluoranthene-d13 (Surr)	53		/ 7 - 125
1-Methylnaphthalene-d13 (Surr)	76		49 - 111

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Lab Sample ID: MB 410-315712/4
Matrix: Water
Analysis Batch: 315712

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C7-C12 (1C)	85	U M	250	43	ug/L			11/09/22 14:10	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
a,a,a-Trifluorotoluene (fid) (1C)	88		63 - 163		11/09/22 14:13	1

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC) (Continued)

Lab Sample ID: LCS 410-315712/5
Matrix: Water
Analysis Batch: 315712

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
C7-C12 (1C)			1100	982	M	ug/L		89	64 - 131		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid) (1C)	*81*		*63 - 163*

Lab Sample ID: LCSD 410-315712/6
Matrix: Water
Analysis Batch: 315712

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
C7-C12 (1C)			1100	977	M	ug/L		89	64 - 131	1	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
a,a,a-Trifluorotoluene (fid) (1C)	*58*		*63 - 163*

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Lab Sample ID: MB 410-313005/1-A
Matrix: Water
Analysis Batch: 313036

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 313005

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
PCB-1016 (1C)	0.20	U	0.25	0.10	ug/L		11/02/22 08:05	11/03/22 08:06	1
PCB-1221 (1C)	0.20	U	0.25	0.10	ug/L		11/02/22 08:05	11/03/22 08:06	1
PCB-1232 (1C)	0.20	U	0.25	0.10	ug/L		11/02/22 08:05	11/03/22 08:06	1
PCB-1242 (1C)	0.20	U	0.25	0.10	ug/L		11/02/22 08:05	11/03/22 08:06	1
PCB-1248 (1C)	0.20	U	0.25	0.10	ug/L		11/02/22 08:05	11/03/22 08:06	1
PCB-1254 (1C)	0.20	U	0.25	0.078	ug/L		11/02/22 08:05	11/03/22 08:06	1
PCB-1260 (1C)	0.20	U	0.25	0.078	ug/L		11/02/22 08:05	11/03/22 08:06	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl (Surr) (1C)	*9/*		*13 - 1/ 5*	*11/03/22 35:36*	*11/04/22 35:39*	*1*
DCB Decachlorobiphenyl (Surr) (2C)	*76*		*13 - 1/ 5*	*11/03/22 35:36*	*11/04/22 35:39*	*1*
Tetrachloro-m-xylene (1C)	*99*		*44 - 147*	*11/03/22 35:36*	*11/04/22 35:39*	*1*
Tetrachloro-m-xylene (2C)	*72*		*44 - 147*	*11/03/22 35:36*	*11/04/22 35:39*	*1*

Lab Sample ID: LCS 410-313005/2-A
Matrix: Water
Analysis Batch: 313036

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 313005

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
PCB-1016 (1C)			5.01	4.16		ug/L		83	46 - 129		
PCB-1260 (1C)			5.02	4.06		ug/L		81	45 - 134		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
DCB Decachlorobiphenyl (Surr) (1C)	*/ 4*		*13 - 1/ 5*

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography (Continued)

Lab Sample ID: LCS 410-313005/2-A
Matrix: Water
Analysis Batch: 313036

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 313005

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
DCB Decachlorobiphenyl (Surr) (2C)	*63*		*13 - 1/ 5*
Tetrachloro-m-xylene (1C)	*92*		*44 - 147*
Tetrachloro-m-xylene (2C)	*95*		*44 - 147*

Lab Sample ID: LCSD 410-313005/3-A
Matrix: Water
Analysis Batch: 313036

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 313005

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
PCB-1016 (1C)			5.01	4.29		ug/L		85	46 - 129	3	30
PCB-1260 (1C)			5.02	4.16		ug/L		83	45 - 134	2	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
DCB Decachlorobiphenyl (Surr) (1C)	*48*		*13 - 1/ 5*
DCB Decachlorobiphenyl (Surr) (2C)	*/ 5*		*13 - 1/ 5*
Tetrachloro-m-xylene (1C)	*95*		*44 - 147*
Tetrachloro-m-xylene (2C)	*7/*		*44 - 147*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Lab Sample ID: MB 410-316317/1-A
Matrix: Water
Analysis Batch: 316603

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 316317

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
C12-C24	90	U M	100	45	ug/L		11/10/22 15:59	11/11/22 11:41	1
C24-C40	240	U M	250	100	ug/L		11/10/22 15:59	11/11/22 11:41	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o- terphenyl (Surr)	*77*		*63 - 163*	*110/30/22 16:68*	*110/10/22 11:/ 1*	*1*

Lab Sample ID: LCS 410-316317/2-A
Matrix: Water
Analysis Batch: 316603

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 316317

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
C12-C24			600	262	M	ug/L		44	14 - 115		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
o- terphenyl (Surr)	*56*		*63 - 163*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC) (Continued)

Lab Sample ID: LCSD 410-316317/3-A
Matrix: Water
Analysis Batch: 316603

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 316317

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
C12-C24			600	250	M	ug/L		42	14 - 115	5	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
o- terphenyl (Surr)	*74*		*63 - 163*

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 410-314541/1-A
Matrix: Water
Analysis Batch: 317281

Client Sample ID: Method Blank
Prep Type: Total Recoverable
Prep Batch: 314541

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.0017	U	0.0020	0.00068	mg/L		11/07/22 08:44	11/14/22 08:08	1
Barium	0.0016	U	0.0020	0.00075	mg/L		11/07/22 08:44	11/14/22 08:08	1
Cadmium	0.00040	U	0.00050	0.00015	mg/L		11/07/22 08:44	11/14/22 08:08	1
Chromium	0.00080	U	0.0020	0.00033	mg/L		11/07/22 08:44	11/14/22 08:08	1
Copper	0.00090	U	0.0010	0.00036	mg/L		11/07/22 08:44	11/14/22 08:08	1
Lead	0.00020	U	0.00050	0.000071	mg/L		11/07/22 08:44	11/14/22 08:08	1
Nickel	0.00080	U	0.0015	0.00040	mg/L		11/07/22 08:44	11/14/22 08:08	1
Selenium	0.00060	U	0.0010	0.00028	mg/L		11/07/22 08:44	11/14/22 08:08	1
Silver	0.00030	U	0.00050	0.00010	mg/L		11/07/22 08:44	11/14/22 08:08	1
Zinc	0.0080	U	0.015	0.0040	mg/L		11/07/22 08:44	11/14/22 08:08	1

Lab Sample ID: LCS 410-314541/2-A
Matrix: Water
Analysis Batch: 317281

Client Sample ID: Lab Control Sample
Prep Type: Total Recoverable
Prep Batch: 314541

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	0.500	0.487		mg/L		97	84 - 116
Barium	0.500	0.522		mg/L		104	86 - 114
Cadmium	0.0500	0.0529		mg/L		106	87 - 115
Chromium	0.500	0.494		mg/L		99	85 - 116
Copper	0.500	0.505		mg/L		101	85 - 118
Lead	0.0500	0.0514		mg/L		103	88 - 115
Nickel	0.500	0.499		mg/L		100	85 - 117
Selenium	0.100	0.105		mg/L		105	80 - 120
Silver	0.0500	0.0522		mg/L		104	85 - 116
Zinc	0.500	0.497		mg/L		99	83 - 119

Method: 7470A - Mercury (CVAA)

Lab Sample ID: MB 410-313884/1-A
Matrix: Water
Analysis Batch: 314197

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 313884

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	0.16	U	0.20	0.079	ug/L		11/04/22 08:02	11/04/22 15:36	1

Method: 7470A - Mercury (CVAA) (Continued)

Lab Sample ID: LCS 410-313884/2-A
Matrix: Water
Analysis Batch: 314197

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 313884

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	1.00	1.06		ug/L		106	82 - 119

Method: 1010 - Ignitability, Pensky-Martens Closed-Cup Method

Lab Sample ID: LCS 410-313463/1
Matrix: Water
Analysis Batch: 313463

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Flashpoint	81.0	83.00		Degrees F		102	96.9 - 103.1

Lab Sample ID: LCSD 410-313463/2
Matrix: Water
Analysis Batch: 313463

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Flashpoint	81.0	82.00		Degrees F		101	96.9 - 103.1	1	4

Method: 9012 - Cyanide, Reactive

Lab Sample ID: MB 410-317152/1-A
Matrix: Water
Analysis Batch: 317371

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 317152

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Cyanide, Reactive	50	U	60	20	mg/Kg		11/14/22 08:11	11/14/22 14:21	1

Lab Sample ID: LCS 410-317152/2-A
Matrix: Water
Analysis Batch: 317371

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 317152

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Cyanide, Reactive	1000	500	U	mg/Kg		2	0 - 5.14

Method: 9034 - Sulfide, Reactive

Lab Sample ID: MB 410-317152/1-A
Matrix: Water
Analysis Batch: 317282

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 317152

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfide, Reactive	140	U	160	54	mg/Kg		11/14/22 08:11	11/14/22 12:41	1

Lab Sample ID: LCS 410-317152/25-A
Matrix: Water
Analysis Batch: 317282

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 317152

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Sulfide, Reactive	538	454		mg/Kg		84	56 - 104

Client: Jacobs Engineering Group, Inc.
Project/Site: NBK Keyport

Job ID: 410-103777-1

Method: 9040C - pH

Lab Sample ID: LCS 410-312816/1
Matrix: Water
Analysis Batch: 312816

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
pH	7.00	6.9		S.U.		99	95 - 105

GC/MS Semi VOA

Prep Batch: 313674

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-103777-1	NBKK-IDW04-AQ-102722	Total/NA	Water	3510C	
MB 410-313674/1-A	Method Blank	Total/NA	Water	3510C	
LCS 410-313674/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 410-313674/3-A	Lab Control Sample Dup	Total/NA	Water	3510C	

Analysis Batch: 313853

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-103777-1	NBKK-IDW04-AQ-102722	Total/NA	Water	8270E SIM	313674
MB 410-313674/1-A	Method Blank	Total/NA	Water	8270E SIM	313674
LCS 410-313674/2-A	Lab Control Sample	Total/NA	Water	8270E SIM	313674
LCSD 410-313674/3-A	Lab Control Sample Dup	Total/NA	Water	8270E SIM	313674

GC VOA

Analysis Batch: 315712

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-103777-1	NBKK-IDW04-AQ-102722	Total/NA	Water	NWTPH-Gx	
MB 410-315712/4	Method Blank	Total/NA	Water	NWTPH-Gx	
LCS 410-315712/5	Lab Control Sample	Total/NA	Water	NWTPH-Gx	
LCSD 410-315712/6	Lab Control Sample Dup	Total/NA	Water	NWTPH-Gx	

GC Semi VOA

Prep Batch: 313005

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-103777-1	NBKK-IDW04-AQ-102722	Total/NA	Water	3510C	
MB 410-313005/1-A	Method Blank	Total/NA	Water	3510C	
LCS 410-313005/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 410-313005/3-A	Lab Control Sample Dup	Total/NA	Water	3510C	

Analysis Batch: 313036

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-103777-1	NBKK-IDW04-AQ-102722	Total/NA	Water	8082A	313005
MB 410-313005/1-A	Method Blank	Total/NA	Water	8082A	313005
LCS 410-313005/2-A	Lab Control Sample	Total/NA	Water	8082A	313005
LCSD 410-313005/3-A	Lab Control Sample Dup	Total/NA	Water	8082A	313005

Prep Batch: 316317

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-103777-1	NBKK-IDW04-AQ-102722	Total/NA	Water	3510C	
MB 410-316317/1-A	Method Blank	Total/NA	Water	3510C	
LCS 410-316317/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 410-316317/3-A	Lab Control Sample Dup	Total/NA	Water	3510C	

Analysis Batch: 316603

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-103777-1	NBKK-IDW04-AQ-102722	Total/NA	Water	NWTPH-Dx	316317
MB 410-316317/1-A	Method Blank	Total/NA	Water	NWTPH-Dx	316317
LCS 410-316317/2-A	Lab Control Sample	Total/NA	Water	NWTPH-Dx	316317
LCSD 410-316317/3-A	Lab Control Sample Dup	Total/NA	Water	NWTPH-Dx	316317

Metals

Prep Batch: 313884

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-103777-1	NBKK-IDW04-AQ-102722	Total/NA	Water	7470A	
MB 410-313884/1-A	Method Blank	Total/NA	Water	7470A	
LCS 410-313884/2-A	Lab Control Sample	Total/NA	Water	7470A	

Analysis Batch: 314197

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-103777-1	NBKK-IDW04-AQ-102722	Total/NA	Water	7470A	313884
MB 410-313884/1-A	Method Blank	Total/NA	Water	7470A	313884
LCS 410-313884/2-A	Lab Control Sample	Total/NA	Water	7470A	313884

Prep Batch: 314541

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-103777-1	NBKK-IDW04-AQ-102722	Total Recoverable	Water	3005A	
MB 410-314541/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 410-314541/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

Analysis Batch: 317281

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-103777-1	NBKK-IDW04-AQ-102722	Total Recoverable	Water	6020B	314541
MB 410-314541/1-A	Method Blank	Total Recoverable	Water	6020B	314541
LCS 410-314541/2-A	Lab Control Sample	Total Recoverable	Water	6020B	314541

General Chemistry

Analysis Batch: 312816

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-103777-1	NBKK-IDW04-AQ-102722	Total/NA	Water	9040C	
LCS 410-312816/1	Lab Control Sample	Total/NA	Water	9040C	

Analysis Batch: 313463

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-103777-1	NBKK-IDW04-AQ-102722	Total/NA	Water	1010	
LCS 410-313463/1	Lab Control Sample	Total/NA	Water	1010	
LCSD 410-313463/2	Lab Control Sample Dup	Total/NA	Water	1010	

Prep Batch: 317152

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-103777-1	NBKK-IDW04-AQ-102722	Total/NA	Water	7.3.4	
MB 410-317152/1-A	Method Blank	Total/NA	Water	7.3.4	
LCS 410-317152/25-A	Lab Control Sample	Total/NA	Water	7.3.4	
LCS 410-317152/2-A	Lab Control Sample	Total/NA	Water	7.3.4	

Analysis Batch: 317282

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-103777-1	NBKK-IDW04-AQ-102722	Total/NA	Water	9034	317152
MB 410-317152/1-A	Method Blank	Total/NA	Water	9034	317152
LCS 410-317152/25-A	Lab Control Sample	Total/NA	Water	9034	317152

Analysis Batch: 317371

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-103777-1	NBKK-IDW04-AQ-102722	Total/NA	Water	9012	317152

General Chemistry (Continued)

Analysis Batch: 317371 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 410-317152/1-A	Method Blank	Total/NA	Water	9012	317152
LCS 410-317152/2-A	Lab Control Sample	Total/NA	Water	9012	317152

Lab Chronicle

Client: Jacobs Engineering Group, Inc.
Project/Site: NBK Keyport

Job ID: 410-103777-1

Client Sample ID: NBKK-IDW04-AQ-102722

Date Collected: 10/27/22 15:00
Date Received: 10/29/22 10:00

Lab Sample ID: 410-103777-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3510C			313674	ZB3H	ELLE	11/03/22 15:25
Total/NA	Analysis	8270E SIM		1	313853	SJ89	ELLE	11/04/22 16:36
Total/NA	Analysis	NWTPH-Gx		1	315712	NND8	ELLE	11/09/22 15:51
Total/NA	Prep	3510C			313005	YDF5	ELLE	11/02/22 08:05
Total/NA	Analysis	8082A		1	313036	JC94	ELLE	11/03/22 12:17
Total/NA	Prep	3510C			316317	QJZ6	ELLE	11/10/22 15:59
Total/NA	Analysis	NWTPH-Dx		1	316603	KP5X	ELLE	11/11/22 14:20
Total Recoverable	Prep	3005A			314541	UAMX	ELLE	11/07/22 08:44
Total Recoverable	Analysis	6020B		1	317281	F7JF	ELLE	11/14/22 11:55
Total/NA	Prep	7470A			313884	UAMX	ELLE	11/04/22 08:02
Total/NA	Analysis	7470A		1	314197	UEFS	ELLE	11/04/22 15:57
Total/NA	Analysis	1010		1	313463	USAE	ELLE	11/03/22 08:36 - 11/03/22 08:36 [1]
Total/NA	Prep	7.3.4			317152	USE1	ELLE	11/14/22 08:11
Total/NA	Analysis	9012		1	317371	JCG7	ELLE	11/14/22 14:23
Total/NA	Prep	7.3.4			317152	USE1	ELLE	11/14/22 08:11
Total/NA	Analysis	9034		1	317282	USE1	ELLE	11/14/22 12:41
Total/NA	Analysis	9040C		1	312816	F8TI	ELLE	11/01/22 17:35

[1] Completion dates and times are reported or not reported per method requirements or individual lab discretion.

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Environment Testing, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Accreditation/Certification Summary

Client: Jacobs Engineering Group, Inc. Job ID: 410-103777-1
Project/Site: NBK Keyport

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
A2LA	Dept. of Defense ELAP	0001.01	11-30-22

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
1010		Water	Flashpoint
9012	7.3.4	Water	Cyanide, Reactive
9034	7.3.4	Water	Sulfide, Reactive

Washington	State	C457	04-11-23

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
1010		Water	Flashpoint
6020B	3005A	Water	Arsenic
6020B	3005A	Water	Barium
6020B	3005A	Water	Cadmium
6020B	3005A	Water	Chromium
6020B	3005A	Water	Copper
6020B	3005A	Water	Lead
6020B	3005A	Water	Nickel
6020B	3005A	Water	Selenium
6020B	3005A	Water	Silver
6020B	3005A	Water	Zinc
7470A	7470A	Water	Mercury
8082A	3510C	Water	PCB-1016 (1C)
8082A	3510C	Water	PCB-1221 (1C)
8082A	3510C	Water	PCB-1232 (1C)
8082A	3510C	Water	PCB-1242 (1C)
8082A	3510C	Water	PCB-1248 (1C)
8082A	3510C	Water	PCB-1254 (1C)
8082A	3510C	Water	PCB-1260 (1C)
8270E SIM	3510C	Water	1-Methylnaphthalene
8270E SIM	3510C	Water	2-Methylnaphthalene
8270E SIM	3510C	Water	Acenaphthene
8270E SIM	3510C	Water	Acenaphthylene
8270E SIM	3510C	Water	Anthracene
8270E SIM	3510C	Water	Benzo[a]anthracene
8270E SIM	3510C	Water	Benzo[a]pyrene
8270E SIM	3510C	Water	Benzo[b]fluoranthene
8270E SIM	3510C	Water	Benzo[g,h,i]perylene
8270E SIM	3510C	Water	Benzo[k]fluoranthene
8270E SIM	3510C	Water	Chrysene
8270E SIM	3510C	Water	Dibenz(a,h)anthracene
8270E SIM	3510C	Water	Fluoranthene
8270E SIM	3510C	Water	Fluorene
8270E SIM	3510C	Water	Indeno[1,2,3-cd]pyrene
8270E SIM	3510C	Water	Naphthalene
8270E SIM	3510C	Water	Phenanthrene
8270E SIM	3510C	Water	Pyrene
9012	7.3.4	Water	Cyanide, Reactive

Client: Jacobs Engineering Group, Inc. Job ID: 410-103777-1
Project/Site: NBK Keyport

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC (Continued)

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
9034	7.3.4	Water	Sulfide, Reactive
9040C		Water	Corrosivity
9040C		Water	pH

Method Summary

Client: Jacobs Engineering Group, Inc.
Project/Site: NBK Keyport

Job ID: 410-106222-1

Method	Method Description	Protocol	Laboratory
8C20E SIm	Sed i(olatile Mrganic Cod poun) s LGC/mS SIm7	SW84V	EvvE
NWTPH-Gx	Northwest - Aolatile Petroleud Pro) ucts LGC7	NWTPH	EvvE
808Ck	Polychlorinate) Biphenyls LPCBs7 by Gas Chrod atography	SW84V	EvvE
NWTPH-Dx	Northwest - Sed i-Aolatile Petroleud Pro) ucts LGC7	NWTPH	EvvE
V0C0B	metals LICP/mS7	SW84V	EvvE
2420k	mercury LCAk k 7	SW84V	EvvE
1010	Ignitability, Pens9y-martens Close) -Cup metho)	SW84V	EvvE
R01O	Cyani) e, 3 eacti(e	SW84V	EvvE
R064	Sulfi) e, 3 eacti(e	SW84V	EvvE
R040C	pH	SW84V	EvvE
6005k	Preparation, Total 3 eco(erable or Dissol(e) metals	SW84V	EvvE
6510C	viqui) -viqui) Extraction LSeparatory Funnel7	SW84V	EvvE
5060B	Purge an) Trap	SW84V	EvvE
2.6.6	Cyani) e, 3 eacti(e	SW84V	EvvE
2.6.4	Sulfi) e, 3 eacti(e	SW84V	EvvE
2420k	Preparation, mercury	SW84V	EvvE

Protocol References:

NWTPH U Northwest Total Petroleud Hy) rocarbon

SW84V U =Test metho) s For E(aluating Soli) Waste, Physical/Ched ical metho) s=, Thir) E) ition, No(ed ber 1R8V k n) Its " p) ates.

Laboratory References:

EvvE U Eurofins vancaster vaboratories En(irond ent Testing, vvC, O4O5 New Hollan) Pi9e, vancaster, Pk 12V01, TEv L2127V5V-O600

Sample Summary

Client: Jacobs Engineering Group, Inc.
Project/Site: NBK Keyport

Job ID: 410-103777-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
410-103777-1	NBKK-IDW04-AQ-102722	Water	10/27/22 15:00	10/29/22 10:00

Eurofins Lancaster Laboratories Environme
2425 New Holland Pike
Lancaster, PA 17601
Phone: 717-656-2300 Fax: 717-656-2681

Chain of Custody Record

410-103777 Chain of Custody

eurofins | Environment Testing America

Client Information	Sampler: Griffin Riley	Lab PM: Martin, Elizabeth	COC No: 410-67536-19584.1
Client Contact: Juan Acaron	Phone: 503-410-1217	E-Mail: Elizabeth.Martin@et.eurofinsus.com	Page: Page 1 of 1
Company: Jacobs Engineering Group, Inc.	PWSID:		Job #:
Address: 3011 SW Willston Road	Due Date Requested:		
City: Gainesville	TAT Requested (days):		
State, Zip: FL, 32608-3964	Compliance Project: Δ Yes Δ No		
Phone: 352-384-7002(Tel)	PO #: Purchase Order Requested		
Email: juan.acaron@jacobs.com	WO #:		
Project Name: NBK Keyport	Project #: 41012633		
Site:	SSOW#:		

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8270E_SIM_DOD5 - 8270E_SIM_DOD5	8082A_DOD5 - 8082A_DOD5	9012_ReactiveCN - 9012_ReactiveCN	9034_Reactive - 9034_Reactive Sulfide	1010, 9040C	6020B_DOD5, 7470A_DOD5	NWTPH_Dx - NWTPH_Dx	NWTPH_Gx - NWTPH_Gx	Total Number of containers	Special Instructions/Note:
			Preservation Code:				N	N	N	N	N	D	A	A		
NBKK-IDW04-AQ-102722	10/27	1500	C	W	N	N	~~N~~ 2	2	1	1	1	1	2	3		

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
Griffin Riley	10/28 1300	Jacobs			
				10/28/21 1000	

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 0.9

Ver: 06/08/2021

11/18/2022

Login Sample Receipt Checklist

Client: Jacobs Engineering Group, Inc. Job Number: 410-103777-1

Login Number: 103777 **List Source: Eurofins Lancaster Laboratories Environment Testing, LLC**
List Number: 1
Creator: McBeth, Jessica

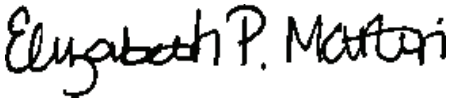
Question	Answer	Comment
The cooler's custody seal is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable (</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	True	
Sample custody seals are intact.	N/A	
VOA sample vials do not have headspace >6mm in diameter (none, if from WV)?	N/A	

Eurofins Lancaster Laboratories Environment Testing, LLC

Job Notes

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Authorization



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Authorized for release by
Elizabeth Martin, Project Manager
Elizabeth.Martin@et.eurofinsus.com
(717)205-3949

Eurofins Lancaster Laboratories Environment Testing, LLC

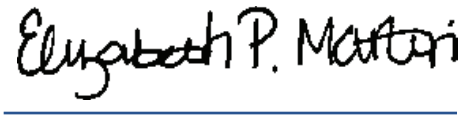
Compliance Statement

Analytical test results meet all requirements of the associated regulatory program (e.g., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis. Data qualifiers are applied to note exceptions. Noncompliant quality control (QC) is further explained in narrative comments.
· QC results that exceed the upper limits and are associated with non-detect samples are qualified but further narration is not required since the bias is high and does not change a non-detect result. Further narration is also not required with QC blank detection when the associated sample concentration is non-detect or more than ten times the level in the blank.
· Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD is performed, unless otherwise specified in the method.
· Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.
Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Measurement uncertainty values, as applicable, are available upon request.

Test results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" and tested in the laboratory are not performed within 15 minutes of collection.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. The foregoing express warranty is exclusive and is given in lieu of all other warranties, expressed or implied, except as otherwise agreed. We disclaim any other warranties, expressed or implied, including a warranty of fitness for particular purpose and warranty of merchantability. In no event shall Eurofins Lancaster Laboratories Environmental, LLC be liable for indirect, special, consequential, or incidental damages including, but not limited to, damages for loss of profit or goodwill regardless of (A) the negligence (either sole or concurrent) of Eurofins Lancaster Laboratories Environmental and (B) whether Eurofins Lancaster Laboratories Environmental has been informed of the possibility of such damages. We accept no legal responsibility for the purposes for which the client uses the test results. Except as otherwise agreed, no purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.



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ANALYTICAL REPORT

PREPARED FOR

Attn: Juan Acaron
Jacobs Engineering Group, Inc.
3011 SW Willston Road
Gainesville, Florida 32608-3964

Generated 12/12/2022 12:02:42 AM

JOB DESCRIPTION

NBK Keyport

JOB NUMBER

410-103779-1

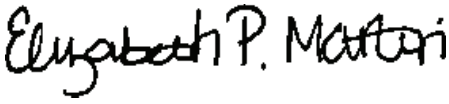
Eurofins Lancaster Laboratories Environment Testing, LLC
2425 New Holland Pike
Lancaster PA 17601

See page two for job notes and contact information.

Job Notes

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Authorization



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12/12/2022 12:02:42 AM

Authorized for release by
Elizabeth Martin, Project Manager
Elizabeth.Martin@et.eurofinsus.com
(717)205-3949

Compliance Statement

Analytical test results meet all requirements of the associated regulatory program (e.g., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis. Data qualifiers are applied to note exceptions. Noncompliant quality control (QC) is further explained in narrative comments.
· QC results that exceed the upper limits and are associated with non-detect samples are qualified but further narration is not required since the bias is high and does not change a non-detect result. Further narration is also not required with QC blank detection when the associated sample concentration is non-detect or more than ten times the level in the blank.
· Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD is performed, unless otherwise specified in the method.
· Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.
Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Measurement uncertainty values, as applicable, are available upon request.

Test results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" and tested in the laboratory are not performed within 15 minutes of collection.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. The foregoing express warranty is exclusive and is given in lieu of all other warranties, expressed or implied, except as otherwise agreed. We disclaim any other warranties, expressed or implied, including a warranty of fitness for particular purpose and warranty of merchantability. In no event shall Eurofins Lancaster Laboratories Environmental, LLC be liable for indirect, special, consequential, or incidental damages including, but not limited to, damages for loss of profit or goodwill regardless of (A) the negligence (either sole or concurrent) of Eurofins Lancaster Laboratories Environmental and (B) whether Eurofins Lancaster Laboratories Environmental has been informed of the possibility of such damages. We accept no legal responsibility for the purposes for which the client uses the test results. Except as otherwise agreed, no purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

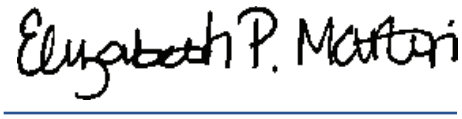

Table of Contents

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
M	Manual integrated compound.
U	Undetected at the Limit of Detection.

GC/MS Semi VOA

Qualifier	Qualifier Description
cn	Refer to Case Narrative for further detail
D	The reported value is from a dilution.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
M	Manual integrated compound.
U	Undetected at the Limit of Detection.

GC VOA

Qualifier	Qualifier Description
D	The reported value is from a dilution.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
U	Undetected at the Limit of Detection.

GC Semi VOA

Qualifier	Qualifier Description
cn	Refer to Case Narrative for further detail
J	Estimated: The analyte was positively identified; the quantitation is an estimation
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
M	Manual integrated compound.
Q	One or more quality control criteria failed.
U	Undetected at the Limit of Detection.

Metals

Qualifier	Qualifier Description
^	Instrument related QC is outside acceptance limits.
D	The reported value is from a dilution.
J	Estimated: The analyte was positively identified; the quantitation is an estimation
J1	Estimated: The quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
U	Undetected at the Limit of Detection.

General Chemistry

Qualifier	Qualifier Description
cn	Refer to Case Narrative for further detail
U	Undetected at the Limit of Detection.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
1C	Result is from the primary column on a dual-column method.
2C	Result is from the confirmation column on a dual-column method.
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)

Glossary (Continued)

Abbreviation	These commonly used abbreviations may or may not be present in this report.
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 410-103779-1

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC

Narrative

Job Narrative
410-103779-1

Receipt
The samples were received on 10/29/2022 10:00 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 0.9°C.

GC/MS VOA
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

GC/MS Semi VOA
Method 8270E_SIM_DOD5: The following samples were diluted due to the nature of the sample matrix: NBKK-IDW02-SO-102722 (410-103779-2) and NBKK-IDW03-SO-102722 (410-103779-3). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

GC VOA
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

GC Semi VOA
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

PCBs
Method 8082A_DOD5: Surrogate recovery for the following sample was outside control limits: NBKK-IDW03-SO-102722 (410-103779-3). Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Metals
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry
Method 1010A: The Pensky Martens closed cup apparatus is designed to determine the flash point of a liquid sample. The sample submitted could not be mixed well enough to obtain uniform heating. The temperature being measured was that of the material near the top of the cup. The material at the bottom of the cup could have a higher temperature. The temperature reported may not be accurate.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Detection Summary

Client: Jacobs Engineering Group, Inc.
Project/Site: NBK Keyport

Job ID: 410-103779-1

Client Sample ID: NBKK-IDW01-SO-102722 — Lab Sample ID: 410-103779-1

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Benzo[b]fluoranthene	0.00094	J M	0.0019	0.0015	0.00077	mg/Kg	1	☼	8270E SIM	Total/NA
Benzo[g,h,i]perylene	0.00099	J	0.0019	0.0015	0.00077	mg/Kg	1	☼	8270E SIM	Total/NA
Chrysene	0.00084	J M	0.0019	0.0015	0.00039	mg/Kg	1	☼	8270E SIM	Total/NA
Pyrene	0.00094	J	0.0019	0.0015	0.00077	mg/Kg	1	☼	8270E SIM	Total/NA
C7-C12 (1C)	0.98	J D	5.5	0.55	0.25	mg/Kg	25	☼	NWTPH-Gx	Total/NA
Arsenic	2.1	D	0.41	0.33	0.14	mg/Kg	2	☼	6020B	Total/NA
Barium	44	D	0.41	0.37	0.19	mg/Kg	2	☼	6020B	Total/NA
Cadmium	0.066	J D	0.10	0.082	0.041	mg/Kg	2	☼	6020B	Total/NA
Chromium	26	D	0.41	0.31	0.16	mg/Kg	2	☼	6020B	Total/NA
Copper	18	D	0.41	0.31	0.090	mg/Kg	2	☼	6020B	Total/NA
Lead	3.5	D	0.20	0.16	0.078	mg/Kg	2	☼	6020B	Total/NA
Nickel	33	D	0.41	0.33	0.17	mg/Kg	2	☼	6020B	Total/NA
Zinc	36	D	31	8.2	4.1	mg/Kg	2	☼	6020B	Total/NA
Barium	310		20	16	7.5	ug/L	1		6020B	TCLP
Chromium	11	J	20	8.0	3.3	ug/L	1		6020B	TCLP
Lead	2.4	J	5.0	2.0	0.71	ug/L	1		6020B	TCLP
Mercury	0.027	J	0.069	0.046	0.023	mg/Kg	1	☼	7471B	Total/NA
Flashpoint	>200	cn	50.0	50.0	50.0	Degrees F	1		1010A	Total/NA

Client Sample ID: NBKK-IDW02-SO-102722 — Lab Sample ID: 410-103779-2

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Benzo[a]anthracene	0.0039	J D M cn	0.0092	0.0074	0.0037	mg/Kg	5	☼	8270E SIM	Total/NA
Benzo[a]pyrene	0.0040	J D cn	0.0092	0.0074	0.0037	mg/Kg	5	☼	8270E SIM	Total/NA
Benzo[b]fluoranthene	0.0051	J D cn	0.0092	0.0074	0.0037	mg/Kg	5	☼	8270E SIM	Total/NA
Benzo[g,h,i]perylene	0.0044	J D M cn	0.0092	0.0074	0.0037	mg/Kg	5	☼	8270E SIM	Total/NA
Chrysene	0.0066	J D M cn	0.0092	0.0074	0.0018	mg/Kg	5	☼	8270E SIM	Total/NA
Fluoranthene	0.0070	J D cn	0.0092	0.0074	0.0037	mg/Kg	5	☼	8270E SIM	Total/NA
Indeno[1,2,3-cd]pyrene	0.0037	J D M cn	0.0092	0.0074	0.0037	mg/Kg	5	☼	8270E SIM	Total/NA
Naphthalene	0.0083	J D cn	0.018	0.015	0.0074	mg/Kg	5	☼	8270E SIM	Total/NA
Phenanthrene	0.010	J D cn	0.013	0.011	0.0055	mg/Kg	5	☼	8270E SIM	Total/NA
Pyrene	0.0074	J D cn	0.0092	0.0074	0.0037	mg/Kg	5	☼	8270E SIM	Total/NA
C7-C12 (1C)	0.92	J D	11	1.1	0.53	mg/Kg	50	☼	NWTPH-Gx	Total/NA
C12-C24	7.6	J M	11	8.9	4.4	mg/Kg	1	☼	NWTPH-Dx	Total/NA
C24-C40	45	M	33	22	11	mg/Kg	1	☼	NWTPH-Dx	Total/NA
Arsenic	2.1	D	0.39	0.31	0.13	mg/Kg	2	☼	6020B	Total/NA
Barium	85	D	0.39	0.35	0.18	mg/Kg	2	☼	6020B	Total/NA
Cadmium	1.1	D	0.098	0.079	0.039	mg/Kg	2	☼	6020B	Total/NA
Chromium	31	D	0.39	0.29	0.15	mg/Kg	2	☼	6020B	Total/NA
Copper	50	D	0.39	0.29	0.086	mg/Kg	2	☼	6020B	Total/NA
Lead	40	D	0.20	0.16	0.075	mg/Kg	2	☼	6020B	Total/NA
Nickel	37	D	0.39	0.31	0.16	mg/Kg	2	☼	6020B	Total/NA
Selenium	0.13	J D	0.39	0.20	0.098	mg/Kg	2	☼	6020B	Total/NA
Silver	0.13	D	0.098	0.079	0.040	mg/Kg	2	☼	6020B	Total/NA
Zinc	56	D	29	7.9	3.9	mg/Kg	2	☼	6020B	Total/NA
Barium	470		20	16	7.5	ug/L	1		6020B	TCLP
Cadmium	12		5.0	4.0	1.5	ug/L	1		6020B	TCLP
Chromium	9.3	J	20	8.0	3.3	ug/L	1		6020B	TCLP
Lead	42		5.0	2.0	0.71	ug/L	1		6020B	TCLP
Mercury	0.038	J	0.064	0.043	0.021	mg/Kg	1	☼	7471B	Total/NA
Flashpoint	>201	cn	50.0	50.0	50.0	Degrees F	1		1010A	Total/NA

This Detection Summary does not include radiochemical test results.

Detection Summary

Client: Jacobs Engineering Group, Inc.
Project/Site: NBK Keyport

Job ID: 410-103779-1

Client Sample ID: NBKK-IDW03-SO-102722 — Lab Sample ID: 410-103779-3

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	Dil Fac	D	Method	Prep Type
Benzo[a]anthracene	0.0070	J D M cn	0.0094	0.0075	0.0038	mg/Kg	5	☼	8270E SIM	Total/NA
Benzo[a]pyrene	0.011	D cn	0.0094	0.0075	0.0038	mg/Kg	5	☼	8270E SIM	Total/NA
Benzo[b]fluoranthene	0.0099	D M cn	0.0094	0.0075	0.0038	mg/Kg	5	☼	8270E SIM	Total/NA
Benzo[g,h,i]perylene	0.0082	J D M cn	0.0094	0.0075	0.0038	mg/Kg	5	☼	8270E SIM	Total/NA
Chrysene	0.020	D M cn	0.0094	0.0075	0.0019	mg/Kg	5	☼	8270E SIM	Total/NA
Fluoranthene	0.012	D M cn	0.0094	0.0075	0.0038	mg/Kg	5	☼	8270E SIM	Total/NA
Indeno[1,2,3-cd]pyrene	0.0059	J D M cn	0.0094	0.0075	0.0038	mg/Kg	5	☼	8270E SIM	Total/NA
Phenanthrene	0.0084	J D cn	0.013	0.011	0.0056	mg/Kg	5	☼	8270E SIM	Total/NA
Pyrene	0.015	D M cn	0.0094	0.0075	0.0038	mg/Kg	5	☼	8270E SIM	Total/NA
C7-C12 (1C)	0.73	J D	6.2	0.62	0.29	mg/Kg	25	☼	NWTPH-Gx	Total/NA
C12-C24	8.0	J M	11	8.9	4.5	mg/Kg	1	☼	NWTPH-Dx	Total/NA
C24-C40	85	M	34	22	11	mg/Kg	1	☼	NWTPH-Dx	Total/NA
Arsenic	2.6	D	0.36	0.29	0.12	mg/Kg	2	☼	6020B	Total/NA
Barium	73	D	0.36	0.32	0.16	mg/Kg	2	☼	6020B	Total/NA
Cadmium	0.085	J D	0.090	0.072	0.036	mg/Kg	2	☼	6020B	Total/NA
Chromium	32	D	0.36	0.27	0.14	mg/Kg	2	☼	6020B	Total/NA
Copper	18	D	0.36	0.27	0.079	mg/Kg	2	☼	6020B	Total/NA
Lead	15	D	0.18	0.14	0.068	mg/Kg	2	☼	6020B	Total/NA
Nickel	45	D	0.36	0.29	0.15	mg/Kg	2	☼	6020B	Total/NA
Silver	0.43	D	0.090	0.072	0.037	mg/Kg	2	☼	6020B	Total/NA
Zinc	40	D	27	7.2	3.6	mg/Kg	2	☼	6020B	Total/NA
Barium	590		20	16	7.5	ug/L	1		6020B	TCLP
Chromium	5.2	J	20	8.0	3.3	ug/L	1		6020B	TCLP
Lead	5.9		5.0	2.0	0.71	ug/L	1		6020B	TCLP
Mercury	0.043	J	0.068	0.045	0.023	mg/Kg	1	☼	7471B	Total/NA
Flashpoint	>201	cn	50.0	50.0	50.0	Degrees F	1		1010A	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: BKWW-ID5 01-SO-10M2MM
Date Cdlle/ tec: 109M29MM16:00
Date Re/ eivec: 109MN9MM10:00

Lab Sample ID: 410-10622N-1
r atxio: Sdlic
Pex/ ent Sdlics: 87.8

r ethdc: S5 84V 8MV0D - gdlatile Ox(ani/ Cdmpduncs G) C9r ST- QCLP

y nalFte	Result	Aualifex	LOA	LOD	DL	f nit	D	y nalFUec	Dil za/
Benzene	12	U	20	12	6.0	ug/L		11/23/22 14:17	20
Carbon tetrachloride	12	U	20	12	6.0	ug/L		11/23/22 14:17	20
Chlorobenzene	12	U	20	12	6.0	ug/L		11/23/22 14:17	20
Chloroform	12	U	20	12	6.0	ug/L		11/23/22 14:17	20
1,2-Dichloroethane	12	U	20	12	6.0	ug/L		11/23/22 14:17	20
1,1-Dichloroethene	12	U	20	12	6.0	ug/L		11/23/22 14:17	20
2-Butanone	20	U M	200	20	10	ug/L		11/23/22 14:17	20
Tetrachloroethene	12	U	20	12	6.0	ug/L		11/23/22 14:17	20
Trichloroethene	12	U	20	12	6.0	ug/L		11/23/22 14:17	20
Vinyl chloride	10	U	20	10	4.0	ug/L		11/23/22 14:17	20

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*107*		*81 - 118*		*11/23/22 14:17*	*20*
4-Bromofluorobenzene (Surr)	*100*		*85 - 114*		*11/23/22 14:17*	*20*
Dibromofluoromethane (Surr)	*105*		*80 - 119*		*11/23/22 14:17*	*20*
Toluene-d8 (Surr)	*102*		*89 - 112*		*11/23/22 14:17*	*20*

r ethdc: S5 84V 8M20H Slr - Semivdlatile Ox(ani/ Cdmpduncs G) C9r S Slr T

y nalFte	Result	Aualifex	LOA	LOD	DL	f nit	D	y nalFUec	Dil za/
1-Methylnaphthalene	0.0015	U	0.0019	0.0015	0.00077	mg/Kg	☼	11/11/22 07:22	1
2-Methylnaphthalene	0.0031	U	0.0039	0.0031	0.0015	mg/Kg	☼	11/11/22 07:22	1
Acenaphthene	0.0015	U M	0.0019	0.0015	0.00077	mg/Kg	☼	11/11/22 07:22	1
Acenaphthylene	0.0015	U	0.0019	0.0015	0.00039	mg/Kg	☼	11/11/22 07:22	1
Anthracene	0.0015	U	0.0019	0.0015	0.00077	mg/Kg	☼	11/11/22 07:22	1
Benzo[a]anthracene	0.0015	U	0.0019	0.0015	0.00077	mg/Kg	☼	11/11/22 07:22	1
Benzo[a]pyrene	0.0015	U	0.0019	0.0015	0.00077	mg/Kg	☼	11/11/22 07:22	1
KenUd3oJEudxanthene	0.000N4	wr	0.0019	0.0015	0.00077	mg/Kg	☼	11/11/22 07:22	1
KenUd3(khkJpexFlene	0.000NN	w	0.0019	0.0015	0.00077	mg/Kg	☼	11/11/22 07:22	1
Benzo[k]fluoranthene	0.0015	U M	0.0019	0.0015	0.00077	mg/Kg	☼	11/11/22 07:22	1
ChxFsene	0.00084	wr	0.0019	0.0015	0.00039	mg/Kg	☼	11/11/22 07:22	1
Dibenz(a,h)anthracene	0.0015	U M	0.0019	0.0015	0.00077	mg/Kg	☼	11/11/22 07:22	1
Fluoranthene	0.0015	U	0.0019	0.0015	0.00077	mg/Kg	☼	11/11/22 07:22	1
Fluorene	0.0015	U	0.0019	0.0015	0.00077	mg/Kg	☼	11/11/22 07:22	1
Indeno[1,2,3-cd]pyrene	0.0015	U M	0.0019	0.0015	0.00077	mg/Kg	☼	11/11/22 07:22	1
Naphthalene	0.0031	U	0.0039	0.0031	0.0015	mg/Kg	☼	11/11/22 07:22	1
Phenanthrene	0.0023	U	0.0027	0.0023	0.0012	mg/Kg	☼	11/11/22 07:22	1
PFxene	0.000N4	w	0.0019	0.0015	0.00077	mg/Kg	☼	11/11/22 07:22	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Benzo(a)pyrene-d12 (Surr)	*88*		*19 - 133*	*11/10/22 16:10*	*11/11/22 07:22*	*1*
Fluoranthene-d10 (Surr)	*87*		*22 - 152*	*11/10/22 16:10*	*11/11/22 07:22*	*1*
1-Methylnaphthalene-d10 (Surr)	*85*		*26 - 123*	*11/10/22 16:10*	*11/11/22 07:22*	*1*

r ethdc: S5 84V 8M20H - Semivdlatile Ox(ani/ Cdmpduncs G) C9r ST- QCLP

y nalFte	Result	Aualifex	LOA	LOD	DL	f nit	D	y nalFUec	Dil za/
1,4-Dichlorobenzene	0.0050	U	0.010	0.0050	0.0025	mg/L		11/20/22 16:46	1
2,4,5-Trichlorophenol	0.0050	U	0.010	0.0050	0.0025	mg/L		11/20/22 16:46	1
2,4,6-Trichlorophenol	0.0050	U	0.010	0.0050	0.0025	mg/L		11/20/22 16:46	1
2,4-Dinitrotoluene	0.010	U	0.025	0.010	0.0050	mg/L		11/20/22 16:46	1
2-Methylphenol	0.0050	U	0.010	0.0050	0.0025	mg/L		11/20/22 16:46	1

Client Sample ID: BKWW-ID5 01-SO-10M2MM
Date Cdlle/ tec: 109M29MM16:00
Date Re/ eivec: 109MN9MM10:00

Lab Sample ID: 410-10622N-1
r atxio: Sdlic
Pex/ ent Sdlics: 87.8

r ethdc: S5 84V 8M20H - Semivdlatile Ox(ani/ Cdmpduncs G; C9r ST- QCLP GCdntinuecT

y nalFte	Result	Aualifiex	LOA	LOD	DL	f nit	D	y nalFUec	Dil za/
4-Methylphenol	0.0050	U	0.010	0.0050	0.0025	mg/L		11/20/22 16:46	1
Hexachlorobenzene	0.0011	U	0.0025	0.0011	0.00055	mg/L		11/20/22 16:46	1
Hexachlorobutadiene	0.0050	U	0.010	0.0050	0.0025	mg/L		11/20/22 16:46	1
Hexachloroethane	0.0050	U	0.025	0.0050	0.0025	mg/L		11/20/22 16:46	1
Nitrobenzene	0.0050	U M	0.010	0.0050	0.0025	mg/L		11/20/22 16:46	1
Pentachlorophenol	0.020	U M	0.025	0.020	0.0050	mg/L		11/20/22 16:46	1
Pyridine	0.020	U	0.025	0.020	0.010	mg/L		11/20/22 16:46	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*97*		*43 - 140*	*11/18/22 17:20*	*11/20/22 16:46*	*1*
2-Fluorobiphenyl (Surr)	*85*		*44 - 119*	*11/18/22 17:20*	*11/20/22 16:46*	*1*
2-Fluorophenol (Surr)	*37*		*19 - 119*	*11/18/22 17:20*	*11/20/22 16:46*	*1*
Nitrobenzene-d5 (Surr)	*90*		*44 - 120*	*11/18/22 17:20*	*11/20/22 16:46*	*1*
p-Terphenyl-d14 (Surr)	*95*		*50 - 134*	*11/18/22 17:20*	*11/20/22 16:46*	*1*
Phenol-d5 (Surr)	*25*		*10 - 120*	*11/18/22 17:20*	*11/20/22 16:46*	*1*

r ethdc: B5 QPZ-) o - Bdxth> est - gdlatile Petxdleum Pxdcu/ ts G; CT

y nalFte	Result	Aualifiex	LOA	LOD	DL	f nit	D	y nalFUec	Dil za/
C2-C1MG1CT	0.N8	wD	5.5	0.55	0.25	mg/Kg	☼	11/09/22 16:39	25

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*54*		*50 - 150*	*10/31/22 16:34*	*11/09/22 16:39*	*25*

r ethdc: S5 84V 808My - PdIF/ hIdxinatec KiphenFls GPCKsTbF) as Chxdmatd(xaphF

y nalFte	Result	Aualifiex	LOA	LOD	DL	f nit	D	y nalFUec	Dil za/
PCB-1016 (1C)	0.012	U	0.020	0.012	0.0061	mg/Kg	☼	11/11/22 00:04	1
PCB-1221 (1C)	0.012	U	0.020	0.012	0.0061	mg/Kg	☼	11/11/22 00:04	1
PCB-1232 (1C)	0.012	U	0.020	0.012	0.0061	mg/Kg	☼	11/11/22 00:04	1
PCB-1242 (1C)	0.012	U	0.020	0.012	0.0061	mg/Kg	☼	11/11/22 00:04	1
PCB-1248 (1C)	0.012	U	0.020	0.012	0.0061	mg/Kg	☼	11/11/22 00:04	1
PCB-1254 (1C)	0.012	U	0.020	0.012	0.0074	mg/Kg	☼	11/11/22 00:04	1
PCB-1260 (1C)	0.012	U	0.020	0.012	0.0074	mg/Kg	☼	11/11/22 00:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene (1C)	*81*		*44 - 130*	*11/10/22 16:15*	*11/11/22 00:04*	*1*
Tetrachloro-m-xylene (2C)	*81*		*44 - 130*	*11/10/22 16:15*	*11/11/22 00:04*	*1*
DCB Decachlorobiphenyl (Surr) (1C)	*69*		*66 - 130*	*11/10/22 16:15*	*11/11/22 00:04*	*1*
DCB Decachlorobiphenyl (Surr) (2C)	*82*		*66 - 130*	*11/10/22 16:15*	*11/11/22 00:04*	*1*

r ethdc: B5 QPZ-Do - Bdxth> est - Semi-gdlatile Petxdleum Pxdcu/ ts G; CT

y nalFte	Result	Aualifiex	LOA	LOD	DL	f nit	D	y nalFUec	Dil za/
C12-C24	9.3	U M J1	12	9.3	4.6	mg/Kg	☼	11/09/22 20:44	1
C24-C40	23	U M	35	23	12	mg/Kg	☼	11/09/22 20:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o- terphenyl (Surr)	*98*		*50 - 150*	*11/09/22 08:17*	*11/09/22 20:44*	*1*

r ethdc: S5 84V V0M0K - r etals GCP9r ST

y nalFte	Result	Aualifiex	LOA	LOD	DL	f nit	D	y nalFUec	Dil za/
yxseni/	M1	D	0.41	0.33	0.14	mg/Kg	☼	11/11/22 12:15	2
Kaxium	44	D	0.41	0.37	0.19	mg/Kg	☼	11/11/22 12:15	2

Client Sample ID: BKWW-ID5 01-SO-10M2MM

Lab Sample ID: 410-10622N-1

Date Cdlle/ tec: 109M29MM16:00
r atxio: Sdlic
Date Re/ eivec: 109MN9MM10:00
Pex/ ent Sdlics: 87.8

r ethdc: S5 84V V0M0K - r etals GCP9r STGCdntinuecT

y nalFte	Result	AualiEex	LOA	LOD	DL	f nit	D	y nalFUec	Dil za/
Cacmium	0.0VV	wD	0.10	0.082	0.041	mg/Kg	☼	11/11/22 12:15	2
Chxdmium	MV	D	0.41	0.31	0.16	mg/Kg	☼	11/11/22 12:15	2
Cdppex	18	D	0.41	0.31	0.090	mg/Kg	☼	11/11/22 12:15	2
Leac	6.7	D	0.20	0.16	0.078	mg/Kg	☼	11/11/22 12:15	2
Bi/ [el	66	D	0.41	0.33	0.17	mg/Kg	☼	11/11/22 12:15	2
Selenium	0.20	U	0.41	0.20	0.10	mg/Kg	☼	11/11/22 12:15	2
Silver	0.082	U	0.10	0.082	0.042	mg/Kg	☼	11/11/22 12:15	2
] in/	6V	D	31	8.2	4.1	mg/Kg	☼	11/11/22 12:15	2

r ethdc: S5 84V V0M0K - r etals GCP9r ST- QCLP

y nalFte	Result	AualiEex	LOA	LOD	DL	f nit	D	y nalFUec	Dil za/
Arsenic	17	U	20	17	6.8	ug/L		12/08/22 12:14	1
Kaxium	610		20	16	7.5	ug/L		12/08/22 12:14	1
Cadmium	4.0	U ^	5.0	4.0	1.5	ug/L		12/08/22 12:14	1
Chxdmium	11	w	20	8.0	3.3	ug/L		12/08/22 12:14	1
Leac	M4	w	5.0	2.0	0.71	ug/L		12/08/22 12:14	1
Selenium	6.0	U	10	6.0	2.8	ug/L		12/08/22 12:14	1
Silver	3.0	U ^ J1	5.0	3.0	1.0	ug/L		12/08/22 12:14	1

r ethdc: S5 84V 2420y - r ex/ uxF GCgy y T- QCLP

y nalFte	Result	AualiEex	LOA	LOD	DL	f nit	D	y nalFUec	Dil za/
Mercury	0.16	U J1	0.20	0.16	0.079	ug/L		11/17/22 13:05	1

r ethdc: S5 84V 2421K - r ex/ uxF GCgy y T

y nalFte	Result	AualiEex	LOA	LOD	DL	f nit	D	y nalFUec	Dil za/
r ex/ uxF	0.0M2	w	0.069	0.046	0.023	mg/Kg	☼	11/04/22 14:28	1

) enexal ChemistxF

y nalFte	Result	AualiEex	LOA	LOD	DL	f nit	D	y nalFUec	Dil za/
zlashpdint G5 84V 1010y T	, M00	/ n	50.0	50.0	50.0	Degrees F		11/15/22 09:05	1
Cyanide, Reactive (SW846 9012)	49	U	59	49	20	mg/Kg		11/14/22 14:23	1
Sulfide, Reactive (SW846 9034)	140	U	160	140	53	mg/Kg		11/14/22 12:41	1
Pex/ ent r distuxe GHPy r distuxeT	14.M		1.0		1.0	%		11/02/22 07:46	1
Pex/ ent Sdlics GHPy r distuxeT	87.8		1.0		1.0	%		11/02/22 07:46	1

Client Sample ID: BKWW-ID5 0M-SO-10M2MM

Lab Sample ID: 410-10622N-M

Date Cdlle/ tec: 109M29MM16:47
r atxio: Sdlic
Date Re/ eivec: 109MN9MM10:00
Pex/ ent Sdlics: N0.1

r ethdc: S5 84V 8MV0D - gdlatile Ox(ani/ Cdmpduncs G/ C9r ST- QCLP

y nalFte	Result	AualiEex	LOA	LOD	DL	f nit	D	y nalFUec	Dil za/
Benzene	12	U	20	12	6.0	ug/L		11/23/22 14:39	20
Carbon tetrachloride	12	U	20	12	6.0	ug/L		11/23/22 14:39	20
Chlorobenzene	12	U	20	12	6.0	ug/L		11/23/22 14:39	20
Chloroform	12	U	20	12	6.0	ug/L		11/23/22 14:39	20
1,2-Dichloroethane	12	U	20	12	6.0	ug/L		11/23/22 14:39	20
1,1-Dichloroethene	12	U	20	12	6.0	ug/L		11/23/22 14:39	20
2-Butanone	20	U	200	20	10	ug/L		11/23/22 14:39	20
Tetrachloroethene	12	U	20	12	6.0	ug/L		11/23/22 14:39	20
Trichloroethene	12	U	20	12	6.0	ug/L		11/23/22 14:39	20
Vinyl chloride	10	U	20	10	4.0	ug/L		11/23/22 14:39	20

Client Sample ID: BKWW-ID5 0M-SO-10M2MM
Date Cdlle/ tec: 109M29MM16:47
Date Re/ eivec: 109MN9MM10:00

Lab Sample ID: 410-10622N-M
r atxio: Sdlic
Pex/ ent Sdlics: N0.1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	106		81 - 118		11/23/22 14:39	20
4-Bromofluorobenzene (Surr)	102		85 - 114		11/23/22 14:39	20
Dibromofluoromethane (Surr)	108		80 - 119		11/23/22 14:39	20
Toluene-d8 (Surr)	101		89 - 112		11/23/22 14:39	20

r ethdc: S5 84V 8M20H Slr - Semivdlatile Ox(ani/ Cdmpduncs G; C9r S Slr T

y nalFte	Result	Aualifex	LOA	LOD	DL	f nit	D	y nalFUec	Dil za/
1-Methylnaphthalene	0.0074	U cn	0.0092	0.0074	0.0037	mg/Kg	☼	11/11/22 07:46	5
2-Methylnaphthalene	0.015	U cn	0.018	0.015	0.0074	mg/Kg	☼	11/11/22 07:46	5
Acenaphthene	0.0074	U cn	0.0092	0.0074	0.0037	mg/Kg	☼	11/11/22 07:46	5
Acenaphthylene	0.0074	U cn	0.0092	0.0074	0.0018	mg/Kg	☼	11/11/22 07:46	5
Anthracene	0.0074	U cn	0.0092	0.0074	0.0037	mg/Kg	☼	11/11/22 07:46	5
KenUd3aJanthxa/ ene	0.006N	wD r / n	0.0092	0.0074	0.0037	mg/Kg	☼	11/11/22 07:46	5
KenUd3aJpFxene	0.0040	wD / n	0.0092	0.0074	0.0037	mg/Kg	☼	11/11/22 07:46	5
KenUd3bJEudxanthene	0.0071	wD / n	0.0092	0.0074	0.0037	mg/Kg	☼	11/11/22 07:46	5
KenUd3(khkJpexFlene	0.0044	wD r / n	0.0092	0.0074	0.0037	mg/Kg	☼	11/11/22 07:46	5
Benzo[k]fluoranthene	0.0074	U cn	0.0092	0.0074	0.0037	mg/Kg	☼	11/11/22 07:46	5
ChxFsene	0.00VV	wD r / n	0.0092	0.0074	0.0018	mg/Kg	☼	11/11/22 07:46	5
Dibenz(a,h)anthracene	0.0074	U M cn	0.0092	0.0074	0.0037	mg/Kg	☼	11/11/22 07:46	5
zludxanthene	0.0020	wD / n	0.0092	0.0074	0.0037	mg/Kg	☼	11/11/22 07:46	5
Fluorene	0.0074	U M cn	0.0092	0.0074	0.0037	mg/Kg	☼	11/11/22 07:46	5
Incend31kM6-/ cJpFxene	0.0062	wD r / n	0.0092	0.0074	0.0037	mg/Kg	☼	11/11/22 07:46	5
Baphthalene	0.0086	wD / n	0.018	0.015	0.0074	mg/Kg	☼	11/11/22 07:46	5
Phenanthxene	0.010	wD / n	0.013	0.011	0.0055	mg/Kg	☼	11/11/22 07:46	5
PFxene	0.0024	wD / n	0.0092	0.0074	0.0037	mg/Kg	☼	11/11/22 07:46	5

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Benzo(a)pyrene-d12 (Surr)	79	cn	19 - 133	11/10/22 16:10	11/11/22 07:46	5
Fluoranthene-d10 (Surr)	79	cn	22 - 152	11/10/22 16:10	11/11/22 07:46	5
1-Methylnaphthalene-d10 (Surr)	79	cn	26 - 123	11/10/22 16:10	11/11/22 07:46	5

r ethdc: S5 84V 8M20H - Semivdlatile Ox(ani/ Cdmpduncs G; C9r ST- QCLP

y nalFte	Result	Aualifex	LOA	LOD	DL	f nit	D	y nalFUec	Dil za/
1,4-Dichlorobenzene	0.0050	U	0.010	0.0050	0.0025	mg/L		11/20/22 17:50	1
2,4,5-Trichlorophenol	0.0050	U	0.010	0.0050	0.0025	mg/L		11/20/22 17:50	1
2,4,6-Trichlorophenol	0.0050	U	0.010	0.0050	0.0025	mg/L		11/20/22 17:50	1
2,4-Dinitrotoluene	0.010	U	0.025	0.010	0.0050	mg/L		11/20/22 17:50	1
2-Methylphenol	0.0050	U	0.010	0.0050	0.0025	mg/L		11/20/22 17:50	1
4-Methylphenol	0.0050	U	0.010	0.0050	0.0025	mg/L		11/20/22 17:50	1
Hexachlorobenzene	0.0011	U	0.0025	0.0011	0.00055	mg/L		11/20/22 17:50	1
Hexachlorobutadiene	0.0050	U	0.010	0.0050	0.0025	mg/L		11/20/22 17:50	1
Hexachloroethane	0.0050	U	0.025	0.0050	0.0025	mg/L		11/20/22 17:50	1
Nitrobenzene	0.0050	U M	0.010	0.0050	0.0025	mg/L		11/20/22 17:50	1
Pentachlorophenol	0.020	U M	0.025	0.020	0.0050	mg/L		11/20/22 17:50	1
Pyridine	0.020	U	0.025	0.020	0.010	mg/L		11/20/22 17:50	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol (Surr)	94		43 - 140	11/18/22 17:20	11/20/22 17:50	1
2-Fluorobiphenyl (Surr)	84		44 - 119	11/18/22 17:20	11/20/22 17:50	1
2-Fluorophenol (Surr)	41		19 - 119	11/18/22 17:20	11/20/22 17:50	1
Nitrobenzene-d5 (Surr)	93		44 - 120	11/18/22 17:20	11/20/22 17:50	1

Client Sample ID: BKWW-ID5 0M-SO-10M2MM
Date Cdlle/ tec: 109M29MM16:47
Date Re/ eivec: 109MN9MM10:00

Lab Sample ID: 410-10622N-M
r atxio: Sdlic
Pex/ ent Sdlics: N0.1

r ethdc: S5 84V 8M20H - Semivdlatile Ox(ani/ Cdmpduncs G; C9r ST- QCLP GCdntinuecT

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
p-Terphenyl-d14 (Surr)	85		50 - 134	11/18/22 17:20	11/20/22 17:50	1
Phenol-d5 (Surr)	28		10 - 120	11/18/22 17:20	11/20/22 17:50	1

r ethdc: B5 QPZ-) o - Bdxth> est - gdlatile Petxdleum Pxdcu/ ts G; CT

y nalFte	Result	AualiEex	LOA	LOD	DL	f nit	D	y nalFUec	Dil za/
C2-C1MG1CT	0.NM	wD	11	1.1	0.53	mg/Kg	☼	11/09/22 17:15	50

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
a,a,a-Trifluorotoluene (fid) (1C)	93		50 - 150	10/31/22 16:34	11/09/22 17:15	50

r ethdc: S5 84V 808My - PdlF/ hldxinatec KiphenFls GPCKsTbF) as Chxdmatd(xaphF

y nalFte	Result	AualiEex	LOA	LOD	DL	f nit	D	y nalFUec	Dil za/
PCB-1016 (1C)	0.011	U M	0.019	0.011	0.0058	mg/Kg	☼	11/11/22 00:14	1
PCB-1221 (1C)	0.011	U	0.019	0.011	0.0058	mg/Kg	☼	11/11/22 00:14	1
PCB-1232 (1C)	0.011	U M	0.019	0.011	0.0058	mg/Kg	☼	11/11/22 00:14	1
PCB-1242 (1C)	0.011	U M	0.019	0.011	0.0058	mg/Kg	☼	11/11/22 00:14	1
PCB-1248 (1C)	0.011	U M	0.019	0.011	0.0058	mg/Kg	☼	11/11/22 00:14	1
PCB-1254 (2C)	0.011	U	0.019	0.011	0.0070	mg/Kg	☼	11/11/22 00:14	1
PCB-1260 (1C)	0.011	U M	0.019	0.011	0.0070	mg/Kg	☼	11/11/22 00:14	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
Tetrachloro-m-xylene (1C)	82		44 - 130	11/10/22 16:15	11/11/22 00:14	1
Tetrachloro-m-xylene (2C)	83		44 - 130	11/10/22 16:15	11/11/22 00:14	1
DCB Decachlorobiphenyl (Surr) (1C)	76		66 - 130	11/10/22 16:15	11/11/22 00:14	1
DCB Decachlorobiphenyl (Surr) (2C)	101		66 - 130	11/10/22 16:15	11/11/22 00:14	1

r ethdc: B5 QPZ-Do - Bdxth> est - Semi-gdlatile Petxdleum Pxdcu/ ts G; CT

y nalFte	Result	AualiEex	LOA	LOD	DL	f nit	D	y nalFUec	Dil za/
C1M-CM4	2.V	wr	11	8.9	4.4	mg/Kg	☼	11/09/22 21:44	1
CM4-C40	47	r	33	22	11	mg/Kg	☼	11/09/22 21:44	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
o- terphenyl (Surr)	99		50 - 150	11/09/22 08:17	11/09/22 21:44	1

r ethdc: S5 84V V0M0K - r etals GCP9r ST

y nalFte	Result	AualiEex	LOA	LOD	DL	f nit	D	y nalFUec	Dil za/
y xseni/	M1	D	0.39	0.31	0.13	mg/Kg	☼	11/11/22 12:06	2
Kaxium	87	D	0.39	0.35	0.18	mg/Kg	☼	11/11/22 12:06	2
Cacmium	1.1	D	0.098	0.079	0.039	mg/Kg	☼	11/11/22 12:06	2
Chxdmium	61	D	0.39	0.29	0.15	mg/Kg	☼	11/11/22 12:06	2
Cdppex	70	D	0.39	0.29	0.086	mg/Kg	☼	11/11/22 12:06	2
Leac	40	D	0.20	0.16	0.075	mg/Kg	☼	11/11/22 12:06	2
Bi/ [el	62	D	0.39	0.31	0.16	mg/Kg	☼	11/11/22 12:06	2
Selenium	0.16	wD	0.39	0.20	0.098	mg/Kg	☼	11/11/22 12:06	2
Silvex	0.16	D	0.098	0.079	0.040	mg/Kg	☼	11/11/22 12:06	2
] in/	7V	D	29	7.9	3.9	mg/Kg	☼	11/11/22 12:06	2

r ethdc: S5 84V V0M0K - r etals GCP9r ST- QCLP

y nalFte	Result	AualiEex	LOA	LOD	DL	f nit	D	y nalFUec	Dil za/
Arsenic	17	U	20	17	6.8	ug/L		12/03/22 18:07	1
Kaxium	420		20	16	7.5	ug/L		12/03/22 18:07	1

Client Sample ID: BKWW-ID5 0M-SO-10M2MM

Lab Sample ID: 410-10622N-M

Date Cdlle/ tec: 109M29MM16:47

r atxio: Sdlic

Date Re/ eivec: 109MN9MM10:00

Pex/ ent Sdlics: N0.1

r ethdc: S5 84V V0M0K - r etals GCP9r ST- QCLP GCdntinuecT

y nalFte	Result	Aualifex	LOA	LOD	DL	f nit	D	y nalFUec	Dil za/
Cacmium	1M		5.0	4.0	1.5	ug/L		12/03/22 18:07	1
Chxdmium	N.6	w	20	8.0	3.3	ug/L		12/03/22 18:07	1
Leac	4M		5.0	2.0	0.71	ug/L		12/03/22 18:07	1
Selenium	6.0	U	10	6.0	2.8	ug/L		12/03/22 18:07	1
Silver	3.0	U	5.0	3.0	1.0	ug/L		12/03/22 18:07	1

r ethdc: S5 84V 2420y - r ex/ uxF GCgy y T- QCLP

y nalFte	Result	Aualifex	LOA	LOD	DL	f nit	D	y nalFUec	Dil za/
Mercury	0.16	U	0.20	0.16	0.079	ug/L		11/17/22 13:27	1

r ethdc: S5 84V 2421K - r ex/ uxF GCgy y T

y nalFte	Result	Aualifex	LOA	LOD	DL	f nit	D	y nalFUec	Dil za/
r ex/ uxF	0.068	w	0.064	0.043	0.021	mg/Kg	☼	11/04/22 14:26	1

) enexal ChemistxF

y nalFte	Result	Aualifex	LOA	LOD	DL	f nit	D	y nalFUec	Dil za/
zlashpdint G5 84V 1010yT	, M01	/ n	50.0	50.0	50.0	Degrees F		11/15/22 09:05	1
Cyanide, Reactive (SW846 9012)	49	U	59	49	20	mg/Kg		11/14/22 14:26	1
Sulfide, Reactive (SW846 9034)	140	U	160	140	52	mg/Kg		11/14/22 12:41	1
Pex/ ent r distuxe GHPy r distuxeT	N.N		1.0		1.0	%		11/02/22 07:46	1
Pex/ ent Sdlics GHPy r distuxeT	N0.1		1.0		1.0	%		11/02/22 07:46	1

Client Sample ID: BKWW-ID5 06-SO-10M2MM

Lab Sample ID: 410-10622N-6

Date Cdlle/ tec: 109M29MM14:17

r atxio: Sdlic

Date Re/ eivec: 109MN9MM10:00

Pex/ ent Sdlics: 88.8

r ethdc: S5 84V 8MV0D - gdlatile Ox(ani/ Cdmpduncs G; C9r ST- QCLP

y nalFte	Result	Aualifex	LOA	LOD	DL	f nit	D	y nalFUec	Dil za/
Benzene	12	U	20	12	6.0	ug/L		11/23/22 15:01	20
Carbon tetrachloride	12	U	20	12	6.0	ug/L		11/23/22 15:01	20
Chlorobenzene	12	U	20	12	6.0	ug/L		11/23/22 15:01	20
Chloroform	12	U	20	12	6.0	ug/L		11/23/22 15:01	20
1,2-Dichloroethane	12	U	20	12	6.0	ug/L		11/23/22 15:01	20
1,1-Dichloroethene	12	U	20	12	6.0	ug/L		11/23/22 15:01	20
2-Butanone	20	U M	200	20	10	ug/L		11/23/22 15:01	20
Tetrachloroethene	12	U	20	12	6.0	ug/L		11/23/22 15:01	20
Trichloroethene	12	U	20	12	6.0	ug/L		11/23/22 15:01	20
Vinyl chloride	10	U	20	10	4.0	ug/L		11/23/22 15:01	20

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*110*		*81 - 118*		*11/23/22 15:01*	*20*
4-Bromofluorobenzene (Surr)	*101*		*85 - 114*		*11/23/22 15:01*	*20*
Dibromofluoromethane (Surr)	*109*		*80 - 119*		*11/23/22 15:01*	*20*
Toluene-d8 (Surr)	*101*		*89 - 112*		*11/23/22 15:01*	*20*

r ethdc: S5 84V 8M20H Slr - Semivdlatile Ox(ani/ Cdmpduncs G; C9r S Slr T

y nalFte	Result	Aualifex	LOA	LOD	DL	f nit	D	y nalFUec	Dil za/
1-Methylnaphthalene	0.0075	U cn	0.0094	0.0075	0.0038	mg/Kg	☼	11/11/22 08:09	5
2-Methylnaphthalene	0.015	U cn	0.019	0.015	0.0075	mg/Kg	☼	11/11/22 08:09	5
Acenaphthene	0.0075	U cn	0.0094	0.0075	0.0038	mg/Kg	☼	11/11/22 08:09	5
Acenaphthylene	0.0075	U cn	0.0094	0.0075	0.0019	mg/Kg	☼	11/11/22 08:09	5

Client Sample ID: BKWW-ID5 06-SO-10M2MM
Date Cdlle/ tec: 109M29MM14:17
Date Re/ eivec: 109MN9MM10:00

Lab Sample ID: 410-10622N-6
r atxio: Sdlic
Pex/ ent Sdlics: 88.8

r ethdc: S5 84V 8M20H Slr - Semivdlatile Ox(ani/ Cdmpduncs G; C9r S Slr TGCdntinuecT

y nalFte	Result	Aualiex	LOA	LOD	DL	f nit	D	y nalFUec	Dil za/
Anthracene	0.0075	U cn	0.0094	0.0075	0.0038	mg/Kg	☼	11/11/22 08:09	5
KenUd3aJanthxa/ ene	0.0020	wD r / n	0.0094	0.0075	0.0038	mg/Kg	☼	11/11/22 08:09	5
KenUd3aJpFxene	0.011	D / n	0.0094	0.0075	0.0038	mg/Kg	☼	11/11/22 08:09	5
KenUd3bJEudxanthene	0.00NN	D r / n	0.0094	0.0075	0.0038	mg/Kg	☼	11/11/22 08:09	5
KenUd3(khkJpexFlene	0.008M	wD r / n	0.0094	0.0075	0.0038	mg/Kg	☼	11/11/22 08:09	5
Benzo[k]fluoranthene	0.0075	U cn	0.0094	0.0075	0.0038	mg/Kg	☼	11/11/22 08:09	5
ChxFsene	0.0M0	D r / n	0.0094	0.0075	0.0019	mg/Kg	☼	11/11/22 08:09	5
Dibenz(a,h)anthracene	0.0075	U M cn	0.0094	0.0075	0.0038	mg/Kg	☼	11/11/22 08:09	5
zludxanthene	0.01M	D r / n	0.0094	0.0075	0.0038	mg/Kg	☼	11/11/22 08:09	5
Fluorene	0.0075	U M cn	0.0094	0.0075	0.0038	mg/Kg	☼	11/11/22 08:09	5
Incend31kM6-/ cJpFxene	0.007N	wD r / n	0.0094	0.0075	0.0038	mg/Kg	☼	11/11/22 08:09	5
Naphthalene	0.015	U cn	0.019	0.015	0.0075	mg/Kg	☼	11/11/22 08:09	5
Phenanthxene	0.0084	wD / n	0.013	0.011	0.0056	mg/Kg	☼	11/11/22 08:09	5
PFxene	0.017	D r / n	0.0094	0.0075	0.0038	mg/Kg	☼	11/11/22 08:09	5

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Benzo(a)pyrene-d12 (Surr)	*83*	*cn*	*19 - 133*	*11/10/22 16:10*	*11/11/22 08:09*	*5*
Fluoranthene-d10 (Surr)	*90*	*cn*	*22 - 152*	*11/10/22 16:10*	*11/11/22 08:09*	*5*
1-Methylnaphthalene-d10 (Surr)	*80*	*cn*	*26 - 123*	*11/10/22 16:10*	*11/11/22 08:09*	*5*

r ethdc: S5 84V 8M20H - Semivdlatile Ox(ani/ Cdmpduncs G; C9r ST- QCLP

y nalFte	Result	Aualiex	LOA	LOD	DL	f nit	D	y nalFUec	Dil za/
1,4-Dichlorobenzene	0.0050	U	0.010	0.0050	0.0025	mg/L		11/20/22 18:11	1
2,4,5-Trichlorophenol	0.0050	U	0.010	0.0050	0.0025	mg/L		11/20/22 18:11	1
2,4,6-Trichlorophenol	0.0050	U	0.010	0.0050	0.0025	mg/L		11/20/22 18:11	1
2,4-Dinitrotoluene	0.010	U	0.025	0.010	0.0050	mg/L		11/20/22 18:11	1
2-Methylphenol	0.0050	U	0.010	0.0050	0.0025	mg/L		11/20/22 18:11	1
4-Methylphenol	0.0050	U	0.010	0.0050	0.0025	mg/L		11/20/22 18:11	1
Hexachlorobenzene	0.0011	U	0.0025	0.0011	0.00055	mg/L		11/20/22 18:11	1
Hexachlorobutadiene	0.0050	U	0.010	0.0050	0.0025	mg/L		11/20/22 18:11	1
Hexachloroethane	0.0050	U	0.025	0.0050	0.0025	mg/L		11/20/22 18:11	1
Nitrobenzene	0.0050	U M	0.010	0.0050	0.0025	mg/L		11/20/22 18:11	1
Pentachlorophenol	0.020	U	0.025	0.020	0.0050	mg/L		11/20/22 18:11	1
Pyridine	0.020	U	0.025	0.020	0.010	mg/L		11/20/22 18:11	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Tribromophenol (Surr)	*97*		*43 - 140*	*11/18/22 17:20*	*11/20/22 18:11*	*1*
2-Fluorobiphenyl (Surr)	*86*		*44 - 119*	*11/18/22 17:20*	*11/20/22 18:11*	*1*
2-Fluorophenol (Surr)	*43*		*19 - 119*	*11/18/22 17:20*	*11/20/22 18:11*	*1*
Nitrobenzene-d5 (Surr)	*91*		*44 - 120*	*11/18/22 17:20*	*11/20/22 18:11*	*1*
p-Terphenyl-d14 (Surr)	*104*		*50 - 134*	*11/18/22 17:20*	*11/20/22 18:11*	*1*
Phenol-d5 (Surr)	*28*		*10 - 120*	*11/18/22 17:20*	*11/20/22 18:11*	*1*

r ethdc: B5 QPZ-) o - Bdxth> est - gdlatile Petxdleum Pxdcu/ ts G; CT

y nalFte	Result	Aualiex	LOA	LOD	DL	f nit	D	y nalFUec	Dil za/
C2-C1MG1CT	0.26	wD	6.2	0.62	0.29	mg/Kg	☼	11/10/22 16:36	25

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
a,a,a-Trifluorotoluene (fid) (1C)	*103*		*50 - 150*	*11/10/22 15:21*	*11/10/22 16:36*	*25*

Client Sample ID: BKWW-ID5 06-SO-10M2MM
Date Cdlle/ tec: 109M29MM14:17
Date Re/ eivec: 109MN9MM10:00

Lab Sample ID: 410-10622N-6
r atxio: Sdlic
Pex/ ent Sdlics: 88.8

r ethdc: S5 84V 808My - PdlF/ hldxinatec KiphenFls GPCKsTbF) as Chxdmatd(xaphF

y nalFte	Result	Aualiex	LOA	LOD	DL	f nit	D	y nalFUec	Dil za/
PCB-1016 (1C)	0.011	U cn	0.019	0.011	0.0059	mg/Kg	☼	11/11/22 00:24	1
PCB-1221 (1C)	0.011	U cn	0.019	0.011	0.0059	mg/Kg	☼	11/11/22 00:24	1
PCB-1232 (1C)	0.011	U cn	0.019	0.011	0.0059	mg/Kg	☼	11/11/22 00:24	1
PCB-1242 (1C)	0.011	U cn	0.019	0.011	0.0059	mg/Kg	☼	11/11/22 00:24	1
PCB-1248 (1C)	0.011	U M cn	0.019	0.011	0.0059	mg/Kg	☼	11/11/22 00:24	1
PCB-1254 (1C)	0.011	U M cn	0.019	0.011	0.0072	mg/Kg	☼	11/11/22 00:24	1
PCB-1260 (1C)	0.011	U cn	0.019	0.011	0.0072	mg/Kg	☼	11/11/22 00:24	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-m-xylene (1C)	*77*	*cn*	*44 - 130*	*11/10/22 16:15*	*11/11/22 00:24*	*1*
Tetrachloro-m-xylene (2C)	*81*	*cn*	*44 - 130*	*11/10/22 16:15*	*11/11/22 00:24*	*1*
DCB Decachlorobiphenyl (Surr) (1C)	*61*	*Q cn*	*66 - 130*	*11/10/22 16:15*	*11/11/22 00:24*	*1*
DCB Decachlorobiphenyl (Surr) (2C)	*82*	*cn*	*66 - 130*	*11/10/22 16:15*	*11/11/22 00:24*	*1*

r ethdc: B5 QPZ-Do - Bdxth> est - Semi-gdlatile Petxdleum Pxdcu/ ts G CT

y nalFte	Result	Aualiex	LOA	LOD	DL	f nit	D	y nalFUec	Dil za/
C1M-CM4	8.0	wr	11	8.9	4.5	mg/Kg	☼	11/09/22 22:04	1
CM4-C40	87	r	34	22	11	mg/Kg	☼	11/09/22 22:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o- terphenyl (Surr)	*99*		*50 - 150*	*11/09/22 08:17*	*11/09/22 22:04*	*1*

r ethdc: S5 84V V0M0K - r etals GCP9r ST

y nalFte	Result	Aualiex	LOA	LOD	DL	f nit	D	y nalFUec	Dil za/
yxseni/	MV	D	0.36	0.29	0.12	mg/Kg	☼	11/11/22 12:11	2
Kaxium	26	D	0.36	0.32	0.16	mg/Kg	☼	11/11/22 12:11	2
Cacmium	0.087	wD	0.090	0.072	0.036	mg/Kg	☼	11/11/22 12:11	2
Chxdmium	6M	D	0.36	0.27	0.14	mg/Kg	☼	11/11/22 12:11	2
Cdppex	18	D	0.36	0.27	0.079	mg/Kg	☼	11/11/22 12:11	2
Leac	17	D	0.18	0.14	0.068	mg/Kg	☼	11/11/22 12:11	2
Bi/ [el	47	D	0.36	0.29	0.15	mg/Kg	☼	11/11/22 12:11	2
Selenium	0.18	U	0.36	0.18	0.090	mg/Kg	☼	11/11/22 12:11	2
Silvex	0.46	D	0.090	0.072	0.037	mg/Kg	☼	11/11/22 12:11	2
] in/	40	D	27	7.2	3.6	mg/Kg	☼	11/11/22 12:11	2

r ethdc: S5 84V V0M0K - r etals GCP9r ST- QCLP

y nalFte	Result	Aualiex	LOA	LOD	DL	f nit	D	y nalFUec	Dil za/
Arsenic	17	U	20	17	6.8	ug/L		12/03/22 18:03	1
Kaxium	7N0		20	16	7.5	ug/L		12/03/22 18:03	1
Cadmium	4.0	U	5.0	4.0	1.5	ug/L		12/03/22 18:03	1
Chxdmium	7.M	w	20	8.0	3.3	ug/L		12/03/22 18:03	1
Leac	7.N		5.0	2.0	0.71	ug/L		12/03/22 18:03	1
Selenium	6.0	U	10	6.0	2.8	ug/L		12/03/22 18:03	1
Silver	3.0	U	5.0	3.0	1.0	ug/L		12/03/22 18:03	1

r ethdc: S5 84V 2420y - r ex/ uxF GCgy y T- QCLP

y nalFte	Result	Aualiex	LOA	LOD	DL	f nit	D	y nalFUec	Dil za/
Mercury	0.16	U	0.20	0.16	0.079	ug/L		11/17/22 13:21	1

Client: Jacobs Engineering Group, Inc.
Project/Site: NBK Keyport

Job ID: 410-103779-1

Client Sample ID: BKWW-ID5 06-SO-10M2MM
Date Cdlle/ tec: 109M29MM14:17
Date Re/ eivec: 109MN9MM10:00

Lab Sample ID: 410-10622N-6
r atxio: Sdlic
Pex/ ent Sdlics: 88.8

r ethdc: S5 84V 2421K - r ex/ uxF Cgy y T

y nalFte	Result	AualiEex	LOA	LOD	DL	f nit	D	y nalFUec	Dil za/
r ex/ uxF	0.046	w	0.068	0.045	0.023	mg/Kg	☼	11/04/22 14:30	1

) enexal Chemistx F

y nalFte	Result	AualiEex	LOA	LOD	DL	f nit	D	y nalFUec	Dil za/
zlashpdint G55 84V 1010y T	, M01	/ n	50.0	50.0	50.0	Degrees F		11/15/22 09:05	1
Cyanide, Reactive (SW846 9012)	49	U	58	49	19	mg/Kg		11/14/22 14:26	1
Sulfide, Reactive (SW846 9034)	140	U	160	140	52	mg/Kg		11/14/22 12:41	1
Pex/ ent r distuxe GHPy r distuxeT	11.M		1.0		1.0	%		11/02/22 07:46	1
Pex/ ent Sdlics GHPy r distuxeT	88.8		1.0		1.0	%		11/02/22 07:46	1

Surrogate Summary

Client: Jacobs Engineering Group, Inc.
Project/Site: NBK Keyport

Job ID: 410-103779-1

Method: 8260D - Volatile Organic Compounds (GC/MS)

Matrix: Solid — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	DBFM	TOL
Lab Sample ID	Client Sample ID	(81-118)	(85-114)	(80-119)	(89-112)
LCS 410-320545/4	Lab Control Sample	109	105	103	103
MB 410-320545/6	Method Blank	109	102	107	101

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)

Method: 8260D - Volatile Organic Compounds (GC/MS)

Matrix: Solid — **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	DBFM	TOL
Lab Sample ID	Client Sample ID	(81-118)	(85-114)	(80-119)	(89-112)
410-103779-1	NBKK-IDW01-SO-102722	107	100	105	102
410-103779-2	NBKK-IDW02-SO-102722	106	102	108	101
410-103779-3	NBKK-IDW03-SO-102722	110	101	109	101

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
BFB = 4-Bromofluorobenzene (Surr)
DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)

Method: 8270E - Semivolatile Organic Compounds (GC/MS)

Matrix: Solid — **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)					
		TBP	FBP	2FP	NBZ	TPHd14	PHL
Lab Sample ID	Client Sample ID	(43-140)	(44-119)	(19-119)	(44-120)	(50-134)	(10-120)
LCS 410-319197/3-A	Lab Control Sample	101	91	50	94	92	36
MB 410-319197/2-A	Method Blank	86	83	47	90	102	35

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl (Surr)
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
TPHd14 = p-Terphenyl-d14 (Surr)
PHL = Phenol-d5 (Surr)

Method: 8270E - Semivolatile Organic Compounds (GC/MS)

Matrix: Solid — **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)					
		TBP	FBP	2FP	NBZ	TPHd14	PHL
Lab Sample ID	Client Sample ID	(43-140)	(44-119)	(19-119)	(44-120)	(50-134)	(10-120)
410-103779-1	NBKK-IDW01-SO-102722	97	85	37	90	95	25
410-103779-1 MS	NBKK-IDW01-SO-102722	104	89	49	97	103	36
410-103779-1 MSD	NBKK-IDW01-SO-102722	104	91	49	95	105	35
410-103779-2	NBKK-IDW02-SO-102722	94	84	41	93	85	28

Surrogate Summary

Client: Jacobs Engineering Group, Inc.
Project/Site: NBK Keyport

Job ID: 410-103779-1

Method: 8270E - Semivolatile Organic Compounds (GC/MS) (Continued)

Matrix: Solid **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)					
		TBP	FBP	2FP	NBZ	TPHd14	PHL
Lab Sample ID	Client Sample ID	(43-140)	(44-119)	(19-119)	(44-120)	(50-134)	(10-120)
410-103779-3	NBKK-IDW03-SO-102722	97	86	43	91	104	28

Surrogate Legend

TBP = 2,4,6-Tribromophenol (Surr)
FBP = 2-Fluorobiphenyl (Surr)
2FP = 2-Fluorophenol (Surr)
NBZ = Nitrobenzene-d5 (Surr)
TPHd14 = p-Terphenyl-d14 (Surr)
PHL = Phenol-d5 (Surr)

Method: 8270E SIM - Semivolatile Organic Compounds (GC/MS SIM)

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)		
		BAPd12	FLN10	MNPd10
Lab Sample ID	Client Sample ID	(19-133)	(22-152)	(26-123)
410-103779-1	NBKK-IDW01-SO-102722	88	87	85
410-103779-2	NBKK-IDW02-SO-102722	79 cn	79 cn	79 cn
410-103779-3	NBKK-IDW03-SO-102722	83 cn	90 cn	80 cn
LCS 410-316277/2-A	Lab Control Sample	93	80	81
MB 410-316277/1-A	Method Blank	96	84	83

Surrogate Legend

BAPd12 = Benzo(a)pyrene-d12 (Surr)
FLN10 = Fluoranthene-d10 (Surr)
MNPd10 = 1-Methylnaphthalene-d10 (Surr)

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		TFT-F1
Lab Sample ID	Client Sample ID	(50-150)
410-103779-1	NBKK-IDW01-SO-102722	54
410-103779-2	NBKK-IDW02-SO-102722	93
410-103779-3	NBKK-IDW03-SO-102722	103
LCS 410-315620/8	Lab Control Sample	84
LCS 410-316166/6	Lab Control Sample	93
LCSD 410-315620/9	Lab Control Sample Dup	84
LCSD 410-316166/7	Lab Control Sample Dup	92
MB 410-315620/5	Method Blank	93
MB 410-316166/5	Method Blank	100

Surrogate Legend

TFT-F = a,a,a-Trifluorotoluene (fid)

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		TCX1	TCX2	DCB1	DCB2
Lab Sample ID	Client Sample ID	(44-130)	(44-130)	(66-130)	(66-130)
410-103779-1	NBKK-IDW01-SO-102722	81	81	69	82

Surrogate Summary

Client: Jacobs Engineering Group, Inc. Job ID: 410-103779-1
Project/Site: NBK Keyport

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography (Continued)

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		TCX1	TCX2	DCB1	DCB2
Lab Sample ID	Client Sample ID	(44-130)	(44-130)	(66-130)	(66-130)
410-103779-2	NBKK-IDW02-SO-102722	82	83	76	101
410-103779-3	NBKK-IDW03-SO-102722	77 cn	81 cn	61 Q cn	82 cn
LCS 410-316282/2-A	Lab Control Sample		90		95
LCSD 410-316282/3-A	Lab Control Sample Dup		87		97
MB 410-316282/1-A	Method Blank		86		88

Surrogate Legend

TCX = Tetrachloro-m-xylene
DCB = DCB Decachlorobiphenyl (Surr)

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		OTP
Lab Sample ID	Client Sample ID	(50-150)
410-103779-1	NBKK-IDW01-SO-102722	98
410-103779-1 DU	NBKK-IDW01-SO-102722	96
410-103779-1 MS	NBKK-IDW01-SO-102722	99
410-103779-2	NBKK-IDW02-SO-102722	99
410-103779-3	NBKK-IDW03-SO-102722	99
LCS 410-315509/2-A	Lab Control Sample	106
MB 410-315509/1-A	Method Blank	103

Surrogate Legend

OTP = o- terphenyl (Surr)

Method: 8260D - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 410-320747/6
Matrix: Solid
Analysis Batch: 320747

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Benzene	0.60	U	1.0	0.60	0.30	ug/L		11/23/22 12:03	1
Carbon tetrachloride	0.60	U	1.0	0.60	0.30	ug/L		11/23/22 12:03	1
Chlorobenzene	0.60	U	1.0	0.60	0.30	ug/L		11/23/22 12:03	1
Chloroform	0.60	U	1.0	0.60	0.30	ug/L		11/23/22 12:03	1
1,2-Dichloroethane	0.60	U	1.0	0.60	0.30	ug/L		11/23/22 12:03	1
1,1-Dichloroethene	0.60	U	1.0	0.60	0.30	ug/L		11/23/22 12:03	1
2-Butanone	1.0	U	10	1.0	0.50	ug/L		11/23/22 12:03	1
Tetrachloroethene	0.60	U	1.0	0.60	0.30	ug/L		11/23/22 12:03	1
Trichloroethene	0.60	U	1.0	0.60	0.30	ug/L		11/23/22 12:03	1
Vinyl chloride	0.50	U	1.0	0.50	0.20	ug/L		11/23/22 12:03	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*197*		*81 - 118*		*11/20/22 12:50*	*1*
4-: ro3 oBuoromenf ene (Surr)	*192*		*8b - 114*		*11/20/22 12:50*	*1*
Dimro3 oBuoro3 ethane (Surr)	*19z*		*89 - 117*		*11/20/22 12:50*	*1*
Toluene-d8 (Surr)	*191*		*87 - 112*		*11/20/22 12:50*	*1*

Lab Sample ID: LCS 410-320747/4
Matrix: Solid
Analysis Batch: 320747

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Benzene	20.0	21.8		ug/L		109	79 - 120
Carbon tetrachloride	20.0	20.9		ug/L		105	72 - 136
Chlorobenzene	20.0	20.4		ug/L		102	82 - 118
Chloroform	20.0	21.8		ug/L		109	79 - 124
1,2-Dichloroethane	20.0	20.6		ug/L		103	73 - 128
1,1-Dichloroethene	20.0	23.2		ug/L		116	71 - 131
2-Butanone	250	269		ug/L		107	56 - 143
Tetrachloroethene	20.0	20.1		ug/L		101	74 - 129
Trichloroethene	20.0	20.3		ug/L		101	79 - 123
Vinyl chloride	20.0	17.8		ug/L		89	58 - 137

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*197*		*81 - 118*
4-: ro3 oBuoromenf ene (Surr)	*19b*		*8b - 114*
Dimro3 oBuoro3 ethane (Surr)	*190*		*89 - 117*
Toluene-d8 (Surr)	*190*		*87 - 112*

Method: 82E0v - Semi5olatile Organic Compounds (GC/MS)

Lab Sample ID: MB 410-31919E/2-A
Matrix: Solid
Analysis Batch: 319464

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 31919E

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
1,4-Dichlorobenzene	0.0050	U	0.010	0.0050	0.0025	mg/L		11/20/22 15:01	1
2,4,5-Trichlorophenol	0.0050	U	0.010	0.0050	0.0025	mg/L		11/20/22 15:01	1

Method: 82E0v - Semi5olatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 410-31919E/2-A
Matrix: Solid
Analysis Batch: 319464

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 31919E

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
2,4,6-Trichlorophenol	0.0050	U	0.010	0.0050	0.0025	mg/L		11/20/22 15:01	1
2,4-Dinitrotoluene	0.010	U	0.025	0.010	0.0050	mg/L		11/20/22 15:01	1
2-Methylphenol	0.0050	U	0.010	0.0050	0.0025	mg/L		11/20/22 15:01	1
4-Methylphenol	0.0050	U	0.010	0.0050	0.0025	mg/L		11/20/22 15:01	1
Hexachlorobenzene	0.0011	U	0.0025	0.0011	0.00055	mg/L		11/20/22 15:01	1
Hexachlorobutadiene	0.0050	U	0.010	0.0050	0.0025	mg/L		11/20/22 15:01	1
Hexachloroethane	0.0050	U	0.025	0.0050	0.0025	mg/L		11/20/22 15:01	1
Nitrobenzene	0.0050	U M	0.010	0.0050	0.0025	mg/L		11/20/22 15:01	1
Pentachlorophenol	0.020	U	0.025	0.020	0.0050	mg/L		11/20/22 15:01	1
Pyridine	0.020	U	0.025	0.020	0.010	mg/L		11/20/22 15:01	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2,4,6-Trimro3 ophenol (Surr)	*86*		*40 - 149*	*11/18/22 1z529*	*11/29/22 1b591*	*1*
2-Fluoromphenyl (Surr)	*80*		*44 - 117*	*11/18/22 1z529*	*11/29/22 1b591*	*1*
2-Fluorophenol (Surr)	*4z*		*17 - 117*	*11/18/22 1z529*	*11/29/22 1b591*	*1*
Nitromenf ene-db (Surr)	*79*		*44 - 129*	*11/18/22 1z529*	*11/29/22 1b591*	*1*
p-Terphenyl-d14 (Surr)	*192*		*b9 - 104*	*11/18/22 1z529*	*11/29/22 1b591*	*1*
Phenol-db (Surr)	*0b*		*19 - 129*	*11/18/22 1z529*	*11/29/22 1b591*	*1*

Lab Sample ID: LCS 410-31919E/3-A
Matrix: Solid
Analysis Batch: 319464

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 31919E

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1,4-Dichlorobenzene	0.0500	0.0456		mg/L		91	29 - 112
2,4,5-Trichlorophenol	0.0500	0.0499		mg/L		100	53 - 123
2,4,6-Trichlorophenol	0.0500	0.0502		mg/L		100	50 - 125
2,4-Dinitrotoluene	0.0500	0.0609		mg/L		122	57 - 128
2-Methylphenol	0.0500	0.0400		mg/L		80	30 - 117
4-Methylphenol	0.0500	0.0383		mg/L		77	25 - 120
Hexachlorobenzene	0.0500	0.0537		mg/L		107	53 - 125
Hexachlorobutadiene	0.0500	0.0452		mg/L		90	22 - 124
Hexachloroethane	0.0500	0.0456		mg/L		91	21 - 115
Nitrobenzene	0.0500	0.0527		mg/L		105	45 - 121
Pentachlorophenol	0.100	0.108		mg/L		108	35 - 138
Pyridine	0.100	0.0538		mg/L		54	23 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2,4,6-Trimro3 ophenol (Surr)	*191*		*40 - 149*
2-Fluoromphenyl (Surr)	*71*		*44 - 117*
2-Fluorophenol (Surr)	*b9*		*17 - 117*
Nitromenf ene-db (Surr)	*74*		*44 - 129*
p-Terphenyl-d14 (Surr)	*72*		*b9 - 104*
Phenol-db (Surr)	*06*		*19 - 129*

Method: 82E0v - Semi5olatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: 410-103EE9-1 MS
Matrix: Solid
Analysis Batch: 319464

Client Sample ID: NBKK-IDW01-SO-102E22
Prep Type: TCLP
Prep Batch: 31919E

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
1,4-Dichlorobenzene	0.0050	U	0.250	0.226		mg/L		90	29 - 112
2,4,5-Trichlorophenol	0.0050	U	0.250	0.259		mg/L		104	53 - 123
2,4,6-Trichlorophenol	0.0050	U	0.250	0.258		mg/L		103	50 - 125
2,4-Dinitrotoluene	0.010	U	0.250	0.312		mg/L		125	57 - 128
2-Methylphenol	0.0050	U	0.250	0.201		mg/L		80	30 - 117
4-Methylphenol	0.0050	U	0.250	0.191		mg/L		77	25 - 120
Hexachlorobenzene	0.0011	U	0.250	0.278		mg/L		111	53 - 125
Hexachlorobutadiene	0.0050	U	0.250	0.234		mg/L		94	22 - 124
Hexachloroethane	0.0050	U	0.250	0.233		mg/L		93	21 - 115
Nitrobenzene	0.0050	U M	0.250	0.267		mg/L		107	45 - 121
Pentachlorophenol	0.020	U M	0.500	0.559		mg/L		112	35 - 138
Pyridine	0.020	U	0.500	0.246		mg/L		49	23 - 120

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
2,4,6-Trimro3 ophenol (Surr)	*194*		*40 - 149*
2-Fluoromphenyl (Surr)	*87*		*44 - 117*
2-Fluorophenol (Surr)	*47*		*17 - 117*
Nitromenf ene-db (Surr)	*7z*		*44 - 129*
p-Terphenyl-d14 (Surr)	*190*		*b9 - 104*
Phenol-db (Surr)	*06*		*19 - 129*

Lab Sample ID: 410-103EE9-1 MSD
Matrix: Solid
Analysis Batch: 319464

Client Sample ID: NBKK-IDW01-SO-102E22
Prep Type: TCLP
Prep Batch: 31919E

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
1,4-Dichlorobenzene	0.0050	U	0.250	0.217		mg/L		87	29 - 112	4	20
2,4,5-Trichlorophenol	0.0050	U	0.250	0.261		mg/L		105	53 - 123	1	20
2,4,6-Trichlorophenol	0.0050	U	0.250	0.262		mg/L		105	50 - 125	2	20
2,4-Dinitrotoluene	0.010	U	0.250	0.304		mg/L		121	57 - 128	3	20
2-Methylphenol	0.0050	U	0.250	0.203		mg/L		81	30 - 117	1	20
4-Methylphenol	0.0050	U	0.250	0.187		mg/L		75	25 - 120	2	20
Hexachlorobenzene	0.0011	U	0.250	0.278		mg/L		111	53 - 125	0	20
Hexachlorobutadiene	0.0050	U	0.250	0.221		mg/L		88	22 - 124	6	20
Hexachloroethane	0.0050	U	0.250	0.220		mg/L		88	21 - 115	6	20
Nitrobenzene	0.0050	U M	0.250	0.264		mg/L		106	45 - 121	1	20
Pentachlorophenol	0.020	U M	0.500	0.587		mg/L		117	35 - 138	5	20
Pyridine	0.020	U	0.500	0.229		mg/L		46	23 - 120	7	30

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
2,4,6-Trimro3 ophenol (Surr)	*194*		*40 - 149*
2-Fluoromphenyl (Surr)	*71*		*44 - 117*
2-Fluorophenol (Surr)	*47*		*17 - 117*
Nitromenf ene-db (Surr)	*7b*		*44 - 129*
p-Terphenyl-d14 (Surr)	*19b*		*b9 - 104*
Phenol-db (Surr)	*0b*		*19 - 129*

Method: 82E0v SIM - Semi5olatile Organic Compounds (GC/MS SIM)

Lab Sample ID: MB 410-3162EE/1-A
Matrix: Solid
Analysis Batch: 316472

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 3162EE

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
1-Methylnaphthalene	0.0013	U	0.0017	0.0013	0.00067	mg/Kg		11/11/22 04:37	1
2-Methylnaphthalene	0.0027	U	0.0033	0.0027	0.0013	mg/Kg		11/11/22 04:37	1
Acenaphthene	0.0013	U M	0.0017	0.0013	0.00067	mg/Kg		11/11/22 04:37	1
Acenaphthylene	0.0013	U	0.0017	0.0013	0.00033	mg/Kg		11/11/22 04:37	1
Anthracene	0.0013	U	0.0017	0.0013	0.00067	mg/Kg		11/11/22 04:37	1
Benzo[a]anthracene	0.0013	U	0.0017	0.0013	0.00067	mg/Kg		11/11/22 04:37	1
Benzo[a]pyrene	0.0013	U	0.0017	0.0013	0.00067	mg/Kg		11/11/22 04:37	1
Benzo[b]fluoranthene	0.0013	U	0.0017	0.0013	0.00067	mg/Kg		11/11/22 04:37	1
Benzo[g,h,i]perylene	0.0013	U	0.0017	0.0013	0.00067	mg/Kg		11/11/22 04:37	1
Benzo[k]fluoranthene	0.0013	U	0.0017	0.0013	0.00067	mg/Kg		11/11/22 04:37	1
Chrysene	0.0013	U	0.0017	0.0013	0.00033	mg/Kg		11/11/22 04:37	1
Dibenz(a,h)anthracene	0.0013	U	0.0017	0.0013	0.00067	mg/Kg		11/11/22 04:37	1
Fluoranthene	0.0013	U	0.0017	0.0013	0.00067	mg/Kg		11/11/22 04:37	1
Fluorene	0.0013	U M	0.0017	0.0013	0.00067	mg/Kg		11/11/22 04:37	1
Indeno[1,2,3-cd]pyrene	0.0013	U	0.0017	0.0013	0.00067	mg/Kg		11/11/22 04:37	1
Naphthalene	0.0027	U	0.0033	0.0027	0.0013	mg/Kg		11/11/22 04:37	1
Phenanthrene	0.0020	U	0.0023	0.0020	0.0010	mg/Kg		11/11/22 04:37	1
Pyrene	0.0013	U	0.0017	0.0013	0.00067	mg/Kg		11/11/22 04:37	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
: enf o(a)pyrene-d12 (Surr)	*76*		*17 - 100*	*11/19/22 1651 9*	*11/11/22 945 0z*	*1*
Fluoranthene-d19 (Surr)	*84*		*22 - 1b2*	*11/19/22 1651 9*	*11/11/22 945 0z*	*1*
1-Methylnaphthalene-d19 (Surr)	*80*		*26 - 120*	*11/19/22 1651 9*	*11/11/22 945 0z*	*1*

Lab Sample ID: LCS 410-3162EE/2-A
Matrix: Solid
Analysis Batch: 316472

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 3162EE

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1-Methylnaphthalene	0.0333	0.0297		mg/Kg		89	43 - 111
2-Methylnaphthalene	0.0333	0.0272		mg/Kg		82	39 - 114
Acenaphthene	0.0333	0.0293		mg/Kg		88	44 - 111
Acenaphthylene	0.0333	0.0286		mg/Kg		86	39 - 116
Anthracene	0.0333	0.0312		mg/Kg		93	50 - 114
Benzo[a]anthracene	0.0333	0.0299		mg/Kg		90	54 - 122
Benzo[a]pyrene	0.0333	0.0292		mg/Kg		88	50 - 125
Benzo[b]fluoranthene	0.0333	0.0299		mg/Kg		90	53 - 128
Benzo[g,h,i]perylene	0.0333	0.0340		mg/Kg		102	49 - 127
Benzo[k]fluoranthene	0.0333	0.0308		mg/Kg		92	56 - 123
Chrysene	0.0333	0.0288		mg/Kg		86	57 - 118
Dibenz(a,h)anthracene	0.0333	0.0351		mg/Kg		105	50 - 129
Fluoranthene	0.0333	0.0298		mg/Kg		89	55 - 119
Fluorene	0.0333	0.0310		mg/Kg		93	47 - 114
Indeno[1,2,3-cd]pyrene	0.0333	0.0358		mg/Kg		107	49 - 130
Naphthalene	0.0333	0.0292		mg/Kg		88	38 - 111
Phenanthrene	0.0333	0.0310		mg/Kg		93	49 - 113
Pyrene	0.0333	0.0286		mg/Kg		86	55 - 117

Method: 82E0v SIM - Semi5olatile Organic Compounds (GC/MS SIM) (Continued)

Lab Sample ID: LCS 410-3162EE/2-A
Matrix: Solid
Analysis Batch: 316472

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 3162EE

Surrogate	LCS %Recovery	LCS Qualifier	Limits
: enf o(a)pyrene-d12 (Surr)	70		17 - 100
Fluoranthene-d19 (Surr)	89		22 - 1b2
1-Methylnaphthalene-d19 (Surr)	81		26 - 120

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC)

Lab Sample ID: MB 410-317620/7
Matrix: Solid
Analysis Batch: 317620

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
C7-C12 (1C)	0.50	U	5.0	0.50	0.23	mg/Kg		11/09/22 13:29	25

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
a,a,a-Trib uorotoluene (Bd) (1C)	70		b9 - 1b9		11/97/22 105 27	2b

Lab Sample ID: LCS 410-317620/8
Matrix: Solid
Analysis Batch: 317620

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
C7-C12 (1C)			0.440	0.400		mg/Kg		91	55 - 145		

Surrogate	LCS %Recovery	LCS Qualifier	Limits
a,a,a-Trib uorotoluene (Bd) (1C)	84		b9 - 1b9

Lab Sample ID: LCSD 410-317620/9
Matrix: Solid
Analysis Batch: 317620

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
C7-C12 (1C)			0.440	0.403		mg/Kg		92	55 - 145	1	30

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
a,a,a-Trib uorotoluene (Bd) (1C)	84		b9 - 1b9

Lab Sample ID: MB 410-316166/7
Matrix: Solid
Analysis Batch: 316166

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
C7-C12 (1C)	0.50	U	5.0	0.50	0.23	mg/Kg		11/10/22 14:05	25

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
a,a,a-Trib uorotoluene (Bd) (1C)	199		b9 - 1b9		11/19/22 145 9b	2b

Method: NWTPH-Gx - Northwest - Volatile Petroleum Products (GC) (Continued)

Lab Sample ID: LCS 410-316166/6
Matrix: Solid
Analysis Batch: 316166

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
C7-C12 (1C)			11.0	10.6	D	mg/Kg		97	55 - 145		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
a,a,a-Trifluorotoluene (Bfd) (1C)	*70*		*59 - 159*

Lab Sample ID: LCSD 410-316166/E
Matrix: Solid
Analysis Batch: 316166

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
C7-C12 (1C)			11.0	10.7	D	mg/Kg		97	55 - 145	0	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
a,a,a-Trifluorotoluene (Bfd) (1C)	*72*		*59 - 159*

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography

Lab Sample ID: MB 410-316282/1-A
Matrix: Solid
Analysis Batch: 316384

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 316282

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
PCB-1016 (1C)	0.010	U	0.017	0.010	0.0053	mg/Kg		11/10/22 22:19	1
PCB-1221 (1C)	0.010	U	0.017	0.010	0.0053	mg/Kg		11/10/22 22:19	1
PCB-1232 (1C)	0.010	U	0.017	0.010	0.0053	mg/Kg		11/10/22 22:19	1
PCB-1242 (1C)	0.010	U	0.017	0.010	0.0053	mg/Kg		11/10/22 22:19	1
PCB-1248 (1C)	0.010	U	0.017	0.010	0.0053	mg/Kg		11/10/22 22:19	1
PCB-1254 (1C)	0.010	U M	0.017	0.010	0.0064	mg/Kg		11/10/22 22:19	1
PCB-1260 (1C)	0.010	U	0.017	0.010	0.0064	mg/Kg		11/10/22 22:19	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Tetrachloro-3 -xylene (2C)	*86*		*44 - 109*	*11/19/22 16:51*	*11/19/22 22:17*	*1*
DC: Decachlorobiphenyl (Surr) (2C)	*88*		*66 - 109*	*11/19/22 16:51*	*11/19/22 22:17*	*1*

Lab Sample ID: LCS 410-316282/2-A
Matrix: Solid
Analysis Batch: 316384

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 316282

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
PCB-1016 (1C)			0.167	0.149		mg/Kg		89	47 - 134		
PCB-1260 (2C)			0.167	0.167		mg/Kg		100	53 - 140		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Tetrachloro-3 -xylene (2C)	*79*		*44 - 109*
DC: Decachlorobiphenyl (Surr) (2C)	*76*		*66 - 109*

Method: 8082A - Polychlorinated Biphenyls (PCBs) by Gas Chromatography (Continued)

Lab Sample ID: LCSD 410-316282/3-A
Matrix: Solid
Analysis Batch: 316384

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 316282

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
PCB-1016 (1C)			0.167	0.147		mg/Kg		88	47 - 134	1	30
PCB-1260 (1C)			0.167	0.168		mg/Kg		100	53 - 140	0	30

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
Tetrachloro-3 -xylene (2C)	*8z*		*44 - 109*
DC: Decachlorobiphenyl (Surr) (2C)	*7z*		*66 - 109*

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC)

Lab Sample ID: MB 410-317709/1-A
Matrix: Solid
Analysis Batch: 317E64

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 317709

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
C12-C24	8.0	U M	10	8.0	4.0	mg/Kg		11/09/22 16:27	1
C24-C40	20	U M	30	20	10	mg/Kg		11/09/22 16:27	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o- terphenyl (Surr)	*190*		*b9 - 1b9*	*11/97/22 985 1z*	*11/97/22 165 2z*	*1*

Lab Sample ID: LCS 410-317709/2-A
Matrix: Solid
Analysis Batch: 317E64

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 317709

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
C12-C24			133	103		mg/Kg		78	74 - 115		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
o- terphenyl (Surr)	*196*		*b9 - 1b9*

Lab Sample ID: 410-103EE9-1 MS
Matrix: Solid
Analysis Batch: 317E64

Client Sample ID: NBKK-IDW01-SO-102E22
Prep Type: Total/NA
Prep Batch: 317709

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
C12-C24	9.3	U M J1	153	108	M J1	mg/Kg	☼	70	74 - 115		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
o- terphenyl (Surr)	*77*		*b9 - 1b9*

Lab Sample ID: 410-103EE9-1 DU
Matrix: Solid
Analysis Batch: 317E64

Client Sample ID: NBKK-IDW01-SO-102E22
Prep Type: Total/NA
Prep Batch: 317709

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
C12-C24	9.3	U M J1		9.2	U M	mg/Kg	☼			NC	20
C24-C40	23	U M		29.0	J M	mg/Kg	☼			NC	20

Method: NWTPH-Dx - Northwest - Semi-Volatile Petroleum Products (GC) (Continued)

Surrogate	DU %Recovery	DU Qualifier	Limits
o- terphenyl (Surr)	*76*		*b9 - 1b9*

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 410-313E93/1-A ^2
Matrix: Solid
Analysis Batch: 316E07

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 313E93

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	0.32	U	0.40	0.32	0.13	mg/Kg		11/11/22 10:13	2
Barium	0.36	U	0.40	0.36	0.18	mg/Kg		11/11/22 10:13	2
Cadmium	0.080	U	0.10	0.080	0.040	mg/Kg		11/11/22 10:13	2
Chromium	0.30	U	0.40	0.30	0.15	mg/Kg		11/11/22 10:13	2
Copper	0.30	U	0.40	0.30	0.088	mg/Kg		11/11/22 10:13	2
Lead	0.16	U	0.20	0.16	0.076	mg/Kg		11/11/22 10:13	2
Nickel	0.32	U	0.40	0.32	0.16	mg/Kg		11/11/22 10:13	2
Selenium	0.20	U	0.40	0.20	0.10	mg/Kg		11/11/22 10:13	2
Silver	0.080	U	0.10	0.080	0.041	mg/Kg		11/11/22 10:13	2
Zinc	8.0	U	30	8.0	4.0	mg/Kg		11/11/22 10:13	2

Lab Sample ID: LCS 410-313E93/2-A ^2
Matrix: Solid
Analysis Batch: 316E07

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 313E93

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	50.0	49.6	D	mg/Kg		99	82 - 118
Barium	50.0	51.9	D	mg/Kg		104	86 - 116
Cadmium	5.00	5.07	D	mg/Kg		101	84 - 116
Chromium	50.0	52.9	D	mg/Kg		106	83 - 119
Copper	50.0	52.3	D	mg/Kg		105	84 - 119
Lead	5.00	5.23	D	mg/Kg		105	84 - 118
Nickel	50.0	52.2	D	mg/Kg		104	84 - 119
Selenium	10.0	10.1	D	mg/Kg		101	80 - 119
Silver	5.00	5.08	D	mg/Kg		102	83 - 118
Zinc	50.0	52.2	D	mg/Kg		104	82 - 119

Lab Sample ID: MB 410-318462/1-A
Matrix: Solid
Analysis Batch: 323430

Client Sample ID: Method Blank
Prep Type: Total Reco5erable
Prep Batch: 318462

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Arsenic	17	U	20	17	6.8	ug/L		12/03/22 17:41	1
Barium	16	U	20	16	7.5	ug/L		12/03/22 17:41	1
Cadmium	4.0	U	5.0	4.0	1.5	ug/L		12/03/22 17:41	1
Chromium	8.0	U	20	8.0	3.3	ug/L		12/03/22 17:41	1
Lead	2.0	U	5.0	2.0	0.71	ug/L		12/03/22 17:41	1
Selenium	6.0	U	10	6.0	2.8	ug/L		12/03/22 17:41	1
Silver	3.0	U	5.0	3.0	1.0	ug/L		12/03/22 17:41	1

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 410-318462/2-A
Matrix: Solid
Analysis Batch: 323430

Client Sample ID: Lab Control Sample
Prep Type: Total Reco5erable
Prep Batch: 318462

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Arsenic			5000	4810		ug/L		96	84 - 116		
Barium			5000	5200		ug/L		104	86 - 114		
Cadmium			500	516		ug/L		103	87 - 115		
Chromium			5000	4960		ug/L		99	85 - 116		
Lead			500	506		ug/L		101	88 - 115		
Selenium			1000	1050		ug/L		105	80 - 120		
Silver			500	500		ug/L		100	85 - 116		

Lab Sample ID: 410-103EE9-1 MS
Matrix: Solid
Analysis Batch: 327119

Client Sample ID: NBKK-IDW01-SO-102E22
Prep Type: TCLP
Prep Batch: 318462

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Arsenic	17	U	5000	5490	D	ug/L		110	84 - 116		
Barium	310		100000	111000	D	ug/L		110	86 - 114		
Cadmium	4.0	U ^	1000	1050	D ^	ug/L		105	87 - 115		
Chromium	11	J	5000	5640	D	ug/L		113	85 - 116		
Lead	2.4	J	5000	5760	D	ug/L		115	88 - 115		
Selenium	6.0	U	1000	1120	D	ug/L		112	80 - 120		
Silver	3.0	U ^ J1	5000	4670	D ^	ug/L		93	85 - 116		

Lab Sample ID: 410-103EE9-1 MSD
Matrix: Solid
Analysis Batch: 327119

Client Sample ID: NBKK-IDW01-SO-102E22
Prep Type: TCLP
Prep Batch: 318462

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic	17	U	5000	5280	D	ug/L		106	84 - 116	4	20
Barium	310		100000	105000	D	ug/L		104	86 - 114	6	20
Cadmium	4.0	U ^	1000	1060	D ^	ug/L		106	87 - 115	1	20
Chromium	11	J	5000	5260	D	ug/L		105	85 - 116	7	20
Lead	2.4	J	5000	5520	D	ug/L		110	88 - 115	4	20
Selenium	6.0	U	1000	1010	D	ug/L		101	80 - 120	11	20
Silver	3.0	U ^ J1	5000	4450	D ^	ug/L		89	85 - 116	5	20

Lab Sample ID: 410-103EE9-1 DU
Matrix: Solid
Analysis Batch: 327119

Client Sample ID: NBKK-IDW01-SO-102E22
Prep Type: TCLP
Prep Batch: 318462

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Arsenic	17	U		17	U	ug/L				NC	20
Barium	310			250	J1	ug/L				22	20
Cadmium	4.0	U ^		4.0	U	ug/L				NC	20
Chromium	11	J		9.93	J	ug/L				13	20
Lead	2.4	J		1.99	J	ug/L				19	20
Selenium	6.0	U		6.0	U	ug/L				NC	20
Silver	3.0	U ^ J1		3.0	U	ug/L				NC	20

Method: E4E0A - Mercury (CVAA)

Lab Sample ID: MB 410-318464/1-A
Matrix: Solid
Analysis Batch: 318E64

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 318464

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	0.16	U	0.20	0.16	0.079	ug/L		11/17/22 13:01	1

Lab Sample ID: LCS 410-318464/2-A
Matrix: Solid
Analysis Batch: 318E64

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 318464

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	1.00	0.940		ug/L		94	82 - 119

Lab Sample ID: 410-103EE9-1 MS
Matrix: Solid
Analysis Batch: 318E64

Client Sample ID: NBKK-IDW01-SO-102E22
Prep Type: TCLP
Prep Batch: 318464

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.16	U J1	30.0	11.8	J1	ug/L		39	82 - 119

Lab Sample ID: 410-103EE9-1 MSD
Matrix: Solid
Analysis Batch: 318E64

Client Sample ID: NBKK-IDW01-SO-102E22
Prep Type: TCLP
Prep Batch: 318464

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Mercury	0.16	U J1	30.0	12.5	J1	ug/L		42	82 - 119	6	20

Lab Sample ID: 410-103EE9-1 DU
Matrix: Solid
Analysis Batch: 318E64

Client Sample ID: NBKK-IDW01-SO-102E22
Prep Type: TCLP
Prep Batch: 318464

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Mercury	0.16	U J1	0.16	U	ug/L		NC	20

Method: E4E1B - Mercury (CVAA)

Lab Sample ID: MB 410-313801/1-A
Matrix: Solid
Analysis Batch: 3141E4

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 313801

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Mercury	0.024	U	0.036	0.024	0.012	mg/Kg		11/04/22 13:55	1

Lab Sample ID: LCS 410-313801/2-A
Matrix: Solid
Analysis Batch: 3141E4

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 313801

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.100	0.115		mg/Kg		115	80 - 124

Method: 1010A - Ignitability, Pensky-Martens Closed-Cup Method

Lab Sample ID: LCS 410-31E628/1
Matrix: Solid
Analysis Batch: 31E628

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Flashpoint			81.0	83.00		Degrees F		102	96.9 - 103.1		

Lab Sample ID: LCSD 410-31E628/2
Matrix: Solid
Analysis Batch: 31E628

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Flashpoint			81.0	81.00		Degrees F		100	96.9 - 103.1	2	4

Method: 9012 - Cyanide, Reacti5e

Lab Sample ID: MB 410-31E172/1-A
Matrix: Solid
Analysis Batch: 31E3E1

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 31E172

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Cyanide, Reactive	50	U	60	50	20	mg/Kg		11/14/22 14:21	1

Lab Sample ID: LCS 410-31E172/2-A
Matrix: Solid
Analysis Batch: 31E3E1

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 31E172

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Cyanide, Reactive			1000	500	U	mg/Kg		2	0 - 5.14		

Lab Sample ID: 410-103EE9-1 MS
Matrix: Solid
Analysis Batch: 31E3E1

Client Sample ID: NBKK-IDW01-SO-102E22
Prep Type: Total/NA
Prep Batch: 31E172

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Cyanide, Reactive	49	U	983	250	U	mg/Kg		0	0 - 44		

Lab Sample ID: 410-103EE9-1 MSD
Matrix: Solid
Analysis Batch: 31E3E1

Client Sample ID: NBKK-IDW01-SO-102E22
Prep Type: Total/NA
Prep Batch: 31E172

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Cyanide, Reactive	49	U	978	240	U	mg/Kg		0	0 - 44	NC	11

Method: 9034 - Sulfide, Reacti5e

Lab Sample ID: MB 410-31E172/1-A
Matrix: Solid
Analysis Batch: 31E282

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 31E172

Analyte	MB Result	MB Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Sulfide, Reactive	140	U	160	140	54	mg/Kg		11/14/22 12:41	1

Method: 9034 - Sulfide, Reacti5e (Continued)

Lab Sample ID: LCS 410-31E172/27-A
Matrix: Solid
Analysis Batch: 31E282

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 31E172

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Sulfide, Reactive			538	454		mg/Kg		84	56 - 104		

Lab Sample ID: 410-103EE9-1 MS
Matrix: Solid
Analysis Batch: 31E282

Client Sample ID: NBKK-IDW01-SO-102E22
Prep Type: Total/NA
Prep Batch: 31E172

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Sulfide, Reactive	140	U	519	400		mg/Kg		77	56 - 104		

Lab Sample ID: 410-103EE9-1 MSD
Matrix: Solid
Analysis Batch: 31E282

Client Sample ID: NBKK-IDW01-SO-102E22
Prep Type: Total/NA
Prep Batch: 31E172

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Sulfide, Reactive	140	U	523	413		mg/Kg		79	56 - 104	3	52

GC/MS VOA

Leach Batch: 321668

La7 Sambpe II	Cpient Sambpe II	Dreb Pybe	MatriT	Methox	Dreb Batch
410-10622C-1	BKy y -IDW01-N5 -10O2OO	TI Lj	Noie8	1611	
410-10622C-O	BKy y -IDW0O-N5 -10O2OO	TI Lj	Noie8	1611	
410-10622C-6	BKy y -IDW06-N5 -10O2OO	TI Lj	Noie8	1611	

Anapysis Batch: 3d6484

La7 Sambpe II	Cpient Sambpe II	Dreb Pybe	MatriT	Methox	Dreb Batch
410-10622C-1	BKy y -IDW01-N5 -10O2OO	TI Lj	Noie8	7O80D	618004
410-10622C-O	BKy y -IDW0O-N5 -10O2OO	TI Lj	Noie8	7O80D	618004
410-10622C-6	BKy y -IDW06-N5 -10O2OO	TI Lj	Noie8	7O80D	618004
9 K 410-6O0M4M8	9 naho3 Kict k	ToaciSBA	Noie8	7O80D	
LI N 410-6O0M4M84	Lcb I ot aGi Ncm, in	ToaciSBA	Noie8	7O80D	

GC/MS Semi VOA

Leach Batch: 321632

La7 Sambpe II	Cpient Sambpe II	Dreb Pybe	MatriT	Methox	Dreb Batch
410-10622C-1	BKy y -IDW01-N5 -10O2OO	TI Lj	Noie8	1611	
410-10622C-O	BKy y -IDW0O-N5 -10O2OO	TI Lj	Noie8	1611	
410-10622C-6	BKy y -IDW06-N5 -10O2OO	TI Lj	Noie8	1611	
410-10622C-1 9 N	BKy y -IDW01-N5 -10O2OO	TI Lj	Noie8	1611	
410-10622C-1 9 ND	BKy y -IDW01-N5 -10O2OO	TI Lj	Noie8	1611	

Dreb Batch: 321d55

La7 Sambpe II	Cpient Sambpe II	Dreb Pybe	MatriT	Methox	Dreb Batch
410-10622C-1	BKy y -IDW01-N5 -10O2OO	ToaciSBA	Noie8	6M48	
410-10622C-O	BKy y -IDW0O-N5 -10O2OO	ToaciSBA	Noie8	6M48	
410-10622C-6	BKy y -IDW06-N5 -10O2OO	ToaciSBA	Noie8	6M48	
9 K 410-618O22S1-A	9 naho3 Kict k	ToaciSBA	Noie8	6M48	
LI N 410-618O22SO-A	Lcb I ot aGi Ncm, in	ToaciSBA	Noie8	6M48	

Anapysis Batch: 32184d

La7 Sambpe II	Cpient Sambpe II	Dreb Pybe	MatriT	Methox	Dreb Batch
410-10622C-1	BKy y -IDW01-N5 -10O2OO	ToaciSBA	Noie8	7O20g NI9	618O22
410-10622C-O	BKy y -IDW0O-N5 -10O2OO	ToaciSBA	Noie8	7O20g NI9	618O22
410-10622C-6	BKy y -IDW06-N5 -10O2OO	ToaciSBA	Noie8	7O20g NI9	618O22
9 K 410-618O22S1-A	9 naho3 Kict k	ToaciSBA	Noie8	7O20g NI9	618O22
LI N 410-618O22SO-A	Lcb I ot aGi Ncm, in	ToaciSBA	Noie8	7O20g NI9	618O22

Dreb Batch: 329295

La7 Sambpe II	Cpient Sambpe II	Dreb Pybe	MatriT	Methox	Dreb Batch
410-10622C-1	BKy y -IDW01-N5 -10O2OO	TI Lj	Noie8	6M10I	618061
410-10622C-O	BKy y -IDW0O-N5 -10O2OO	TI Lj	Noie8	6M10I	618061
410-10622C-6	BKy y -IDW06-N5 -10O2OO	TI Lj	Noie8	6M10I	618061
9 K 410-61C1C2SO-A	9 naho3 Kict k	ToaciSBA	Noie8	6M10I	
LI N 410-61C1C2S6-A	Lcb I ot aGi Ncm, in	ToaciSBA	Noie8	6M10I	
410-10622C-1 9 N	BKy y -IDW01-N5 -10O2OO	TI Lj	Noie8	6M10I	618061
410-10622C-1 9 ND	BKy y -IDW01-N5 -10O2OO	TI Lj	Noie8	6M10I	618061

Anapysis Batch: 329818

La7 Sambpe II	Cpient Sambpe II	Dreb Pybe	MatriT	Methox	Dreb Batch
410-10622C-1	BKy y -IDW01-N5 -10O2OO	TI Lj	Noie8	7O20g	61C1C2

GC/MS Semi VOA (Continuex)

Anapysis Batch: 329818 (Continuex)

La7 Sambpe II	Cpient Sambpe II	Dreb Pybe	MatriT	Methox	Dreb Batch
410-10622C-O	BKy y-IDW0O-N5 -10O2OO	TI Lj	Noie8	7O20g	61C1C2
410-10622C-6	BKy y-IDW06-N5 -10O2OO	TI Lj	Noie8	7O20g	61C1C2
9 K 410-61C1C2SO-A	9 naho3 Kict k	ToaciSBA	Noie8	7O20g	61C1C2
LI N 410-61C1C2S6-A	Lcb I ot aGi Ncm, in	ToaciSBA	Noie8	7O20g	61C1C2
410-10622C-1 9 N	BKy y-IDW01-N5 -10O2OO	TI Lj	Noie8	7O20g	61C1C2
410-10622C-1 9 ND	BKy y-IDW01-N5 -10O2OO	TI Lj	Noie8	7O20g	61C1C2

GC VOA

Dreb Batch: 32d314

La7 Sambpe II	Cpient Sambpe II	Dreb Pybe	MatriT	Methox	Dreb Batch
410-10622C-1	BKy y-IDW01-N5 -10O2OO	ToaciSBA	Noie8	M06M	
410-10622C-O	BKy y-IDW0O-N5 -10O2OO	ToaciSBA	Noie8	M06M	

Anapysis Batch: 3241d6

La7 Sambpe II	Cpient Sambpe II	Dreb Pybe	MatriT	Methox	Dreb Batch
410-10622C-1	BKy y-IDW01-N5 -10O2OO	ToaciSBA	Noie8	BWTj v-u H	61O68M
410-10622C-O	BKy y-IDW0O-N5 -10O2OO	ToaciSBA	Noie8	BWTj v-u H	61O68M
9 K 410-61M8C03M	9 naho3 Kict k	ToaciSBA	Noie8	BWTj v-u H	
LI N 410-61M8C03S7	Lcb I ot aGi Ncm, in	ToaciSBA	Noie8	BWTj v-u H	
LI ND 410-61M8C03SC	Lcb I ot aGi Ncm, in Dp,	ToaciSBA	Noie8	BWTj v-u H	

Anapysis Batch: 321211

La7 Sambpe II	Cpient Sambpe II	Dreb Pybe	MatriT	Methox	Dreb Batch
410-10622C-6	BKy y-IDW06-N5 -10O2OO	ToaciSBA	Noie8	BWTj v-u H	618O77
9 K 410-6181883M	9 naho3 Kict k	ToaciSBA	Noie8	BWTj v-u H	
LI N 410-6181883S	Lcb I ot aGi Ncm, in	ToaciSBA	Noie8	BWTj v-u H	
LI ND 410-6181882	Lcb I ot aGi Ncm, in Dp,	ToaciSBA	Noie8	BWTj v-u H	

Dreb Batch: 321d00

La7 Sambpe II	Cpient Sambpe II	Dreb Pybe	MatriT	Methox	Dreb Batch
410-10622C-6	BKy y-IDW06-N5 -10O2OO	ToaciSBA	Noie8	M060I	

GC Semi VOA

Dreb Batch: 324469

La7 Sambpe II	Cpient Sambpe II	Dreb Pybe	MatriT	Methox	Dreb Batch
410-10622C-1	BKy y-IDW01-N5 -10O2OO	ToaciSBA	Noie8	6MM0I	
410-10622C-O	BKy y-IDW0O-N5 -10O2OO	ToaciSBA	Noie8	6MM0I	
410-10622C-6	BKy y-IDW06-N5 -10O2OO	ToaciSBA	Noie8	6MM0I	
9 K 410-61MM0CS1-A	9 naho3 Kict k	ToaciSBA	Noie8	6MM0I	
LI N 410-61MM0CSO-A	Lcb I ot aGi Ncm, in	ToaciSBA	Noie8	6MM0I	
410-10622C-1 9 N	BKy y-IDW01-N5 -10O2OO	ToaciSBA	Noie8	6MM0I	
410-10622C-1 Dx	BKy y-IDW01-N5 -10O2OO	ToaciSBA	Noie8	6MM0I	

Anapysis Batch: 324518

La7 Sambpe II	Cpient Sambpe II	Dreb Pybe	MatriT	Methox	Dreb Batch
410-10622C-1	BKy y-IDW01-N5 -10O2OO	ToaciSBA	Noie8	BWTj v-DH	61MM0C
410-10622C-O	BKy y-IDW0O-N5 -10O2OO	ToaciSBA	Noie8	BWTj v-DH	61MM0C
410-10622C-6	BKy y-IDW06-N5 -10O2OO	ToaciSBA	Noie8	BWTj v-DH	61MM0C
9 K 410-61MM0CS1-A	9 naho3 Kict k	ToaciSBA	Noie8	BWTj v-DH	61MM0C
LI N 410-61MM0CSO-A	Lcb I ot aGi Ncm, in	ToaciSBA	Noie8	BWTj v-DH	61MM0C

GC Semi VOA (Continuex)

Anapysis Batch: 324518 (Continuex)

La7 Sambpe II	Cpient Sambpe II	Dreb Pybe	MatriT	Methox	Dreb Batch
410-10622C-1 9 N	BKy y -IDW01-N5 -10O2OO	ToaciSBA	Noie3	BWTj v -DH	61MM0C
410-10622C-1 Dx	BKy y -IDW01-N5 -10O2OO	ToaciSBA	Noie3	BWTj v -DH	61MM0C

Dreb Batch: 321d0d

La7 Sambpe II	Cpient Sambpe II	Dreb Pybe	MatriT	Methox	Dreb Batch
410-10622C-1	BKy y -IDW01-N5 -10O2OO	ToaciSBA	Noie3	6M48	
410-10622C-O	BKy y -IDW0O-N5 -10O2OO	ToaciSBA	Noie3	6M48	
410-10622C-6	BKy y -IDW06-N5 -10O2OO	ToaciSBA	Noie3	6M48	
9 K 410-618O7O3l-A	9 naho3 Kict k	ToaciSBA	Noie3	6M48	
LI N 410-618O7O3D-A	Lcb I ot aGoi Ncm, in	ToaciSBA	Noie3	6M48	
LI ND 410-618O7O36-A	Lcb I ot aGoi Ncm, in Dp,	ToaciSBA	Noie3	6M48	

Anapysis Batch: 321308

La7 Sambpe II	Cpient Sambpe II	Dreb Pybe	MatriT	Methox	Dreb Batch
410-10622C-1	BKy y -IDW01-N5 -10O2OO	ToaciSBA	Noie3	707OA	618O7O
410-10622C-O	BKy y -IDW0O-N5 -10O2OO	ToaciSBA	Noie3	707OA	618O7O
410-10622C-6	BKy y -IDW06-N5 -10O2OO	ToaciSBA	Noie3	707OA	618O7O
9 K 410-618O7O3l-A	9 naho3 Kict k	ToaciSBA	Noie3	707OA	618O7O
LI N 410-618O7O3D-A	Lcb I ot aGoi Ncm, in	ToaciSBA	Noie3	707OA	618O7O
LI ND 410-618O7O36-A	Lcb I ot aGoi Ncm, in Dp,	ToaciSBA	Noie3	707OA	618O7O

Metaps

Dreb Batch: 323593

La7 Sambpe II	Cpient Sambpe II	Dreb Pybe	MatriT	Methox	Dreb Batch
410-10622C-1	BKy y -IDW01-N5 -10O2OO	ToaciSBA	Noie3	60M0K	
410-10622C-O	BKy y -IDW0O-N5 -10O2OO	ToaciSBA	Noie3	60M0K	
410-10622C-6	BKy y -IDW06-N5 -10O2OO	ToaciSBA	Noie3	60M0K	
9 K 410-6162O63l-A UO	9 naho3 Kict k	ToaciSBA	Noie3	60M0K	
LI N 410-6162O63D-A UO	Lcb I ot aGoi Ncm, in	ToaciSBA	Noie3	60M0K	

Dreb Batch: 323062

La7 Sambpe II	Cpient Sambpe II	Dreb Pybe	MatriT	Methox	Dreb Batch
410-10622C-1	BKy y -IDW01-N5 -10O2OO	ToaciSBA	Noie3	2421K	
410-10622C-O	BKy y -IDW0O-N5 -10O2OO	ToaciSBA	Noie3	2421K	
410-10622C-6	BKy y -IDW06-N5 -10O2OO	ToaciSBA	Noie3	2421K	
9 K 410-616701Sl-A	9 naho3 Kict k	ToaciSBA	Noie3	2421K	
LI N 410-616701SD-A	Lcb I ot aGoi Ncm, in	ToaciSBA	Noie3	2421K	

Anapysis Batch: 328258

La7 Sambpe II	Cpient Sambpe II	Dreb Pybe	MatriT	Methox	Dreb Batch
410-10622C-1	BKy y -IDW01-N5 -10O2OO	ToaciSBA	Noie3	2421K	616701
410-10622C-O	BKy y -IDW0O-N5 -10O2OO	ToaciSBA	Noie3	2421K	616701
410-10622C-6	BKy y -IDW06-N5 -10O2OO	ToaciSBA	Noie3	2421K	616701
9 K 410-616701Sl-A	9 naho3 Kict k	ToaciSBA	Noie3	2421K	616701
LI N 410-616701SD-A	Lcb I ot aGoi Ncm, in	ToaciSBA	Noie3	2421K	616701

Leach Batch: 321632

La7 Sambpe II	Cpient Sambpe II	Dreb Pybe	MatriT	Methox	Dreb Batch
410-10622C-1	BKy y -IDW01-N5 -10O2OO	TI Lj	Noie3	1611	
410-10622C-O	BKy y -IDW0O-N5 -10O2OO	TI Lj	Noie3	1611	

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Metaps (Continuex)

Leach Batch: 321632 (Continuex)

La7 Sambpe II	Cpient Sambpe II	Dreb Pybe	MatriT	Methox	Dreb Batch
410-10622C-6	BKy y -IDW06-N5 -10O2OO	TI Lj	Noie3	1611	
410-10622C-1 9 N	BKy y -IDW01-N5 -10O2OO	TI Lj	Noie3	1611	
410-10622C-1 9 ND	BKy y -IDW01-N5 -10O2OO	TI Lj	Noie3	1611	
410-10622C-1 Dx	BKy y -IDW01-N5 -10O2OO	TI Lj	Noie3	1611	

Anapysis Batch: 321564

La7 Sambpe II	Cpient Sambpe II	Dreb Pybe	MatriT	Methox	Dreb Batch
410-10622C-1	BKy y -IDW01-N5 -10O2OO	ToaciSBA	Noie3	80O0K	6162O6
410-10622C-O	BKy y -IDW0O-N5 -10O2OO	ToaciSBA	Noie3	80O0K	6162O6
410-10622C-6	BKy y -IDW06-N5 -10O2OO	ToaciSBA	Noie3	80O0K	6162O6
9 K 410-6162O6SI-A UO	9 naho3 Kict k	ToaciSBA	Noie3	80O0K	6162O6
LI N 410-6162O6SO-A UO	Lcb I ot aGi Ncm, in	ToaciSBA	Noie3	80O0K	6162O6

Dreb Batch: 32081d

La7 Sambpe II	Cpient Sambpe II	Dreb Pybe	MatriT	Methox	Dreb Batch
410-10622C-1	BKy y -IDW01-N5 -10O2OO	TI Lj	Noie3	600MA	618061
410-10622C-O	BKy y -IDW0O-N5 -10O2OO	TI Lj	Noie3	600MA	618061
410-10622C-6	BKy y -IDW06-N5 -10O2OO	TI Lj	Noie3	600MA	618061
9 K 410-61748OSI-A	9 naho3 Kict k	Toaci ^ nsof nGbin	Noie3	600MA	
LI N 410-61748OSO-A	Lcb I ot aGi Ncm, in	Toaci ^ nsof nGbin	Noie3	600MA	
410-10622C-1 9 N	BKy y -IDW01-N5 -10O2OO	TI Lj	Noie3	600MA	618061
410-10622C-1 9 ND	BKy y -IDW01-N5 -10O2OO	TI Lj	Noie3	600MA	618061
410-10622C-1 Dx	BKy y -IDW01-N5 -10O2OO	TI Lj	Noie3	600MA	618061

Dreb Batch: 320818

La7 Sambpe II	Cpient Sambpe II	Dreb Pybe	MatriT	Methox	Dreb Batch
410-10622C-1	BKy y -IDW01-N5 -10O2OO	TI Lj	Noie3	2420A	618061
410-10622C-O	BKy y -IDW0O-N5 -10O2OO	TI Lj	Noie3	2420A	618061
410-10622C-6	BKy y -IDW06-N5 -10O2OO	TI Lj	Noie3	2420A	618061
9 K 410-617484SI-A	9 naho3 Kict k	ToaciSBA	Noie3	2420A	
LI N 410-617484SO-A	Lcb I ot aGi Ncm, in	ToaciSBA	Noie3	2420A	
410-10622C-1 9 N	BKy y -IDW01-N5 -10O2OO	TI Lj	Noie3	2420A	618061
410-10622C-1 9 ND	BKy y -IDW01-N5 -10O2OO	TI Lj	Noie3	2420A	618061
410-10622C-1 Dx	BKy y -IDW01-N5 -10O2OO	TI Lj	Noie3	2420A	618061

Anapysis Batch: 320518

La7 Sambpe II	Cpient Sambpe II	Dreb Pybe	MatriT	Methox	Dreb Batch
410-10622C-1	BKy y -IDW01-N5 -10O2OO	TI Lj	Noie3	2420A	617484
410-10622C-O	BKy y -IDW0O-N5 -10O2OO	TI Lj	Noie3	2420A	617484
410-10622C-6	BKy y -IDW06-N5 -10O2OO	TI Lj	Noie3	2420A	617484
9 K 410-617484SI-A	9 naho3 Kict k	ToaciSBA	Noie3	2420A	617484
LI N 410-617484SO-A	Lcb I ot aGi Ncm, in	ToaciSBA	Noie3	2420A	617484
410-10622C-1 9 N	BKy y -IDW01-N5 -10O2OO	TI Lj	Noie3	2420A	617484
410-10622C-1 9 ND	BKy y -IDW01-N5 -10O2OO	TI Lj	Noie3	2420A	617484
410-10622C-1 Dx	BKy y -IDW01-N5 -10O2OO	TI Lj	Noie3	2420A	617484

Anapysis Batch: 3d3836

La7 Sambpe II	Cpient Sambpe II	Dreb Pybe	MatriT	Methox	Dreb Batch
410-10622C-O	BKy y -IDW0O-N5 -10O2OO	TI Lj	Noie3	80O0K	61748O
410-10622C-6	BKy y -IDW06-N5 -10O2OO	TI Lj	Noie3	80O0K	61748O
9 K 410-61748OSI-A	9 naho3 Kict k	Toaci ^ nsof nGbin	Noie3	80O0K	61748O

Metaps (Continuex)

Anapysis Batch: 3d3836 (Continuex)

La7 Sampbe II	Cpient Sampbe II	Dreb Pybe	MatriT	Methox	Dreb Batch
LI N 410-61748OSO-A	Lcb I ot aGi Ncm, in	Toaci ^ nsof nGbin	Noi8	80O0K	617480

Anapysis Batch: 3d4229

La7 Sampbe II	Cpient Sampbe II	Dreb Pybe	MatriT	Methox	Dreb Batch
410-10622C-1	BKy y -IDW01-N5 -10O2OO	TI Lj	Noi8	80O0K	617480
410-10622C-1 9 N	BKy y -IDW01-N5 -10O2OO	TI Lj	Noi8	80O0K	617480
410-10622C-1 9 ND	BKy y -IDW01-N5 -10O2OO	TI Lj	Noi8	80O0K	617480
410-10622C-1 Dx	BKy y -IDW01-N5 -10O2OO	TI Lj	Noi8	80O0K	617480

GenerapChemistry

Anapysis Batch: 32d958

La7 Sampbe II	Cpient Sampbe II	Dreb Pybe	MatriT	Methox	Dreb Batch
410-10622C-1	BKy y -IDW01-N5 -10O2OO	ToaciSBA	Noi8	9 oeEapGn	
410-10622C-O	BKy y -IDW0O-N5 -10O2OO	ToaciSBA	Noi8	9 oeEapGn	
410-10622C-6	BKy y -IDW06-N5 -10O2OO	ToaciSBA	Noi8	9 oeEapGn	

Dreb Batch: 32524d

La7 Sampbe II	Cpient Sampbe II	Dreb Pybe	MatriT	Methox	Dreb Batch
410-10622C-1	BKy y -IDW01-N5 -10O2OO	ToaciSBA	Noi8	2F6P4	
410-10622C-O	BKy y -IDW0O-N5 -10O2OO	ToaciSBA	Noi8	2F6P4	
410-10622C-6	BKy y -IDW06-N5 -10O2OO	ToaciSBA	Noi8	2F6P4	
9 K 410-6121MOSI-A	9 naho3 Kict k	ToaciSBA	Noi8	2F6P4	
LI N 410-6121MOSOM-A	Lcb I ot aGi Ncm, in	ToaciSBA	Noi8	2F6P4	
LI N 410-6121MOSO-A	Lcb I ot aGi Ncm, in	ToaciSBA	Noi8	2F6P4	
410-10622C-1 9 N	BKy y -IDW01-N5 -10O2OO	ToaciSBA	Noi8	2F6P4	
410-10622C-1 9 N	BKy y -IDW01-N5 -10O2OO	ToaciSBA	Noi8	2F6P4	
410-10622C-1 9 ND	BKy y -IDW01-N5 -10O2OO	ToaciSBA	Noi8	2F6P4	
410-10622C-1 9 ND	BKy y -IDW01-N5 -10O2OO	ToaciSBA	Noi8	2F6P4	

Anapysis Batch: 325d0d

La7 Sampbe II	Cpient Sampbe II	Dreb Pybe	MatriT	Methox	Dreb Batch
410-10622C-1	BKy y -IDW01-N5 -10O2OO	ToaciSBA	Noi8	O064	6121MO
410-10622C-O	BKy y -IDW0O-N5 -10O2OO	ToaciSBA	Noi8	O064	6121MO
410-10622C-6	BKy y -IDW06-N5 -10O2OO	ToaciSBA	Noi8	O064	6121MO
9 K 410-6121MOSI-A	9 naho3 Kict k	ToaciSBA	Noi8	O064	6121MO
LI N 410-6121MOSOM-A	Lcb I ot aGi Ncm, in	ToaciSBA	Noi8	O064	6121MO
410-10622C-1 9 N	BKy y -IDW01-N5 -10O2OO	ToaciSBA	Noi8	O064	6121MO
410-10622C-1 9 ND	BKy y -IDW01-N5 -10O2OO	ToaciSBA	Noi8	O064	6121MO

Anapysis Batch: 325352

La7 Sampbe II	Cpient Sampbe II	Dreb Pybe	MatriT	Methox	Dreb Batch
410-10622C-1	BKy y -IDW01-N5 -10O2OO	ToaciSBA	Noi8	O010	6121MO
410-10622C-O	BKy y -IDW0O-N5 -10O2OO	ToaciSBA	Noi8	O010	6121MO
410-10622C-6	BKy y -IDW06-N5 -10O2OO	ToaciSBA	Noi8	O010	6121MO
9 K 410-6121MOSI-A	9 naho3 Kict k	ToaciSBA	Noi8	O010	6121MO
LI N 410-6121MOSO-A	Lcb I ot aGi Ncm, in	ToaciSBA	Noi8	O010	6121MO
410-10622C-1 9 N	BKy y -IDW01-N5 -10O2OO	ToaciSBA	Noi8	O010	6121MO
410-10622C-1 9 ND	BKy y -IDW01-N5 -10O2OO	ToaciSBA	Noi8	O010	6121MO

GenerapChemistry

Anapysis Batch: 3251d0

La7 Sambpe II	Cpient Sambpe II	Dreb Pybe	MatriT	Methox	Dreb Batch
410-10622C-1	BKy y-IDW01-N5 -10O2OO	ToaciSBA	Noie3	1010A	
410-10622C-O	BKy y-IDW0O-N5 -10O2OO	ToaciSBA	Noie3	1010A	
410-10622C-6	BKy y-IDW06-N5 -10O2OO	ToaciSBA	Noie3	1010A	
LI N 410-6128O7S1	Lcb I ot aGi Ncm, in	ToaciSBA	Noie3	1010A	
LI ND 410-6128O7SO	Lcb I ot aGi Ncm, in Dp,	ToaciSBA	Noie3	1010A	

Client Sample ID: NBKK-IDW01-SO-102722

Lab Sample ID: 410-103779-1

Date Collected: 10/27/22 13:00

Matrix: Solid

Date Received: 10/29/22 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
TCLP	Leach	1311			316004	CZ7N	ELLE	11/10/22 16:53 - 11/11/22 09:27 [1]
TCLP	Analysis	8260D		20	320545	ULCP	ELLE	11/23/22 14:17
TCLP	Leach	1311			316031	UNWS	ELLE	11/10/22 16:45 - 11/11/22 09:30 [1]
TCLP	Prep	3510C			319197	T9CY	ELLE	11/18/22 17:20
TCLP	Analysis	8270E		1	319464	AH7C	ELLE	11/20/22 16:46
TCLP	Leach	1311			316031	UNWS	ELLE	11/10/22 16:45 - 11/11/22 09:30 [1]
TCLP	Prep	3005A			318462	UAMX	ELLE	11/17/22 05:38
TCLP	Analysis	6020B		1	325119	F7JF	ELLE	12/08/22 12:14
TCLP	Leach	1311			316031	UNWS	ELLE	11/10/22 16:45 - 11/11/22 09:30 [1]
TCLP	Prep	7470A			318464	UAMX	ELLE	11/17/22 05:47
TCLP	Analysis	7470A		1	318764	UEFS	ELLE	11/17/22 13:05
Total/NA	Analysis	1010A		1	317628	USAE	ELLE	11/15/22 09:05 - 11/15/22 09:05 [1]
Total/NA	Prep	7.3.4			317152	USE1	ELLE	11/14/22 08:11
Total/NA	Analysis	9012		1	317371	JCG7	ELLE	11/14/22 14:23
Total/NA	Prep	7.3.4			317152	USE1	ELLE	11/14/22 08:11
Total/NA	Analysis	9034		1	317282	USE1	ELLE	11/14/22 12:41
Total/NA	Analysis	Moisture		1	312974	UVJN	ELLE	11/02/22 07:46

Client Sample ID: NBKK-IDW01-SO-102722

Lab Sample ID: 410-103779-1

Date Collected: 10/27/22 13:00

Matrix: Solid

Date Received: 10/29/22 10:00

Percent Solids: 85.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3546			316277	MD4W	ELLE	11/10/22 16:10
Total/NA	Analysis	8270E SIM		1	316452	UJM0	ELLE	11/11/22 07:22
Total/NA	Prep	5035			312365	D8NM	ELLE	10/31/22 16:34
Total/NA	Analysis	NWTPH-Gx		25	315620	MXX6	ELLE	11/09/22 16:39
Total/NA	Prep	3546			316282	MD4W	ELLE	11/10/22 16:15
Total/NA	Analysis	8082A		1	316384	E9VJ	ELLE	11/11/22 00:04
Total/NA	Prep	3550C			315509	A2VL	ELLE	11/09/22 08:17
Total/NA	Analysis	NWTPH-Dx		1	315764	IUSB	ELLE	11/09/22 20:44
Total/NA	Prep	3050B			313793	UAMX	ELLE	11/04/22 05:02
Total/NA	Analysis	6020B		2	316705	F7JF	ELLE	11/11/22 12:15
Total/NA	Prep	7471B			313801	UAMX	ELLE	11/04/22 05:35
Total/NA	Analysis	7471B		1	314174	UEFS	ELLE	11/04/22 14:28

Client Sample ID: NBKK-IDW02-SO-102722

Lab Sample ID: 410-103779-2

Date Collected: 10/27/22 13:45

Matrix: Solid

Date Received: 10/29/22 10:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
TCLP	Leach	1311			316004	CZ7N	ELLE	11/10/22 16:53 - 11/11/22 09:27 [1]
TCLP	Analysis	8260D		20	320545	ULCP	ELLE	11/23/22 14:39

Lab Chronicle

Client: Jacobs Engineering Group, Inc.
Project/Site: NBK Keyport

Job ID: 410-103779-1

Client Sample ID: NBKK-IDW02-SO-102722
Date Collected: 10/27/22 13:45
Date Received: 10/29/22 10:00

Lab Sample ID: 410-103779-2
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
TCLP	Leach	1311			316031	UNWS	ELLE	11/10/22 16:45 - 11/11/22 09:30 [1]
TCLP	Prep	3510C			319197	T9CY	ELLE	11/18/22 17:20
TCLP	Analysis	8270E		1	319464	AH7C	ELLE	11/20/22 17:50
TCLP	Leach	1311			316031	UNWS	ELLE	11/10/22 16:45 - 11/11/22 09:30 [1]
TCLP	Prep	3005A			318462	UAMX	ELLE	11/17/22 05:38
TCLP	Analysis	6020B		1	323430	S4PD	ELLE	12/03/22 18:07
TCLP	Leach	1311			316031	UNWS	ELLE	11/10/22 16:45 - 11/11/22 09:30 [1]
TCLP	Prep	7470A			318464	UAMX	ELLE	11/17/22 05:47
TCLP	Analysis	7470A		1	318764	UEFS	ELLE	11/17/22 13:27
Total/NA	Analysis	1010A		1	317628	USAE	ELLE	11/15/22 09:05 - 11/15/22 09:05 [1]
Total/NA	Prep	7.3.4			317152	USE1	ELLE	11/14/22 08:11
Total/NA	Analysis	9012		1	317371	JCG7	ELLE	11/14/22 14:26
Total/NA	Prep	7.3.4			317152	USE1	ELLE	11/14/22 08:11
Total/NA	Analysis	9034		1	317282	USE1	ELLE	11/14/22 12:41
Total/NA	Analysis	Moisture		1	312974	UVJN	ELLE	11/02/22 07:46

Client Sample ID: NBKK-IDW02-SO-102722
Date Collected: 10/27/22 13:45
Date Received: 10/29/22 10:00

Lab Sample ID: 410-103779-2
Matrix: Solid
Percent Solids: 90.1

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3546			316277	MD4W	ELLE	11/10/22 16:10
Total/NA	Analysis	8270E SIM		5	316452	UJM0	ELLE	11/11/22 07:46
Total/NA	Prep	5035			312365	D8NM	ELLE	10/31/22 16:34
Total/NA	Analysis	NWTPH-Gx		50	315620	MXX6	ELLE	11/09/22 17:15
Total/NA	Prep	3546			316282	MD4W	ELLE	11/10/22 16:15
Total/NA	Analysis	8082A		1	316384	E9VJ	ELLE	11/11/22 00:14
Total/NA	Prep	3550C			315509	A2VL	ELLE	11/09/22 08:17
Total/NA	Analysis	NWTPH-Dx		1	315764	IUSB	ELLE	11/09/22 21:44
Total/NA	Prep	3050B			313793	UAMX	ELLE	11/04/22 05:02
Total/NA	Analysis	6020B		2	316705	F7JF	ELLE	11/11/22 12:06
Total/NA	Prep	7471B			313801	UAMX	ELLE	11/04/22 05:35
Total/NA	Analysis	7471B		1	314174	UEFS	ELLE	11/04/22 14:26

Client Sample ID: NBKK-IDW03-SO-102722
Date Collected: 10/27/22 14:15
Date Received: 10/29/22 10:00

Lab Sample ID: 410-103779-3
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
TCLP	Leach	1311			316004	CZ7N	ELLE	11/10/22 16:53 - 11/11/22 09:27 [1]
TCLP	Analysis	8260D		20	320545	ULCP	ELLE	11/23/22 15:01
TCLP	Leach	1311			316031	UNWS	ELLE	11/10/22 16:45 - 11/11/22 09:30 [1]
TCLP	Prep	3510C			319197	T9CY	ELLE	11/18/22 17:20
TCLP	Analysis	8270E		1	319464	AH7C	ELLE	11/20/22 18:11

Lab Chronicle

Client: Jacobs Engineering Group, Inc.
Project/Site: NBK Keyport

Job ID: 410-103779-1

Client Sample ID: NBKK-IDW03-SO-102722
Date Collected: 10/27/22 14:15
Date Received: 10/29/22 10:00

Lab Sample ID: 410-103779-3
Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
TCLP	Leach	1311			316031	UNWS	ELLE	11/10/22 16:45 - 11/11/22 09:30 [1]
TCLP	Prep	3005A			318462	UAMX	ELLE	11/17/22 05:38
TCLP	Analysis	6020B		1	323430	S4PD	ELLE	12/03/22 18:03
TCLP	Leach	1311			316031	UNWS	ELLE	11/10/22 16:45 - 11/11/22 09:30 [1]
TCLP	Prep	7470A			318464	UAMX	ELLE	11/17/22 05:47
TCLP	Analysis	7470A		1	318764	UEFS	ELLE	11/17/22 13:21
Total/NA	Analysis	1010A		1	317628	USAE	ELLE	11/15/22 09:05 - 11/15/22 09:05 [1]
Total/NA	Prep	7.3.4			317152	USE1	ELLE	11/14/22 08:11
Total/NA	Analysis	9012		1	317371	JCG7	ELLE	11/14/22 14:26
Total/NA	Prep	7.3.4			317152	USE1	ELLE	11/14/22 08:11
Total/NA	Analysis	9034		1	317282	USE1	ELLE	11/14/22 12:41
Total/NA	Analysis	Moisture		1	312974	UVJN	ELLE	11/02/22 07:46

Client Sample ID: NBKK-IDW03-SO-102722
Date Collected: 10/27/22 14:15
Date Received: 10/29/22 10:00

Lab Sample ID: 410-103779-3
Matrix: Solid
Percent Solids: 88.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3546			316277	MD4W	ELLE	11/10/22 16:10
Total/NA	Analysis	8270E SIM		5	316452	UJM0	ELLE	11/11/22 08:09
Total/NA	Prep	5030C			316288	D8NM	ELLE	11/10/22 15:21
Total/NA	Analysis	NWTPH-Gx		25	316166	NND8	ELLE	11/10/22 16:36
Total/NA	Prep	3546			316282	MD4W	ELLE	11/10/22 16:15
Total/NA	Analysis	8082A		1	316384	E9VJ	ELLE	11/11/22 00:24
Total/NA	Prep	3550C			315509	A2VL	ELLE	11/09/22 08:17
Total/NA	Analysis	NWTPH-Dx		1	315764	IUSB	ELLE	11/09/22 22:04
Total/NA	Prep	3050B			313793	UAMX	ELLE	11/04/22 05:02
Total/NA	Analysis	6020B		2	316705	F7JF	ELLE	11/11/22 12:11
Total/NA	Prep	7471B			313801	UAMX	ELLE	11/04/22 05:35
Total/NA	Analysis	7471B		1	314174	UEFS	ELLE	11/04/22 14:30

[1] Completion dates and times are reported or not reported per method requirements or individual lab discretion.

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Environment Testing, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300

Accreditation/Certification Summary

Client: Jacobs Engineering Group, Inc. Job ID: 410-10622P-1
j ro/ectSNite: BKy y eUport

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC

h nless otwerd ise notef , all analUtes vor twis laboratorUd ere coAeref unf er eacw accref itationSertivication belod .

Authority	Program	Identification Number	Expiration Date
L3TL	Dept. ovDevense ETLj	0001.01	11-60-34

mwe vollod ing analUtes are incluf ef in twis report, but twe laboratorUis not certivief bUtwe goAerning autworitU mwis list MaUincluf e analUtes vor d wicw twe agencUf oes not ower certivication.

LnalUsis x etwof	j rep x etwof	x atri7	LnalUte
P013	2.6.4	Nolif	CUanif e, 9eactiAe
P064	2.6.4	Nolif	Nulvif e, 9eactiAe
x oisture		Nolif	j ercent x oisture
x oisture		Nolif	j ercent Nolif s
Raswington	Ntate		C4W2 04-11-36

mwe vollod ing analUtes are incluf ef in twis report, but twe laboratorUis not certivief bUtwe goAerning autworitU mwis list MaUincluf e analUtes vor d wicw twe agencUf oes not ower certivication.

LnalUsis x etwof	j rep x etwof	x atri7	LnalUte
5030K	600WL	Nolif	Lrsenic
5030K	600WL	Nolif	KariuM
5030K	600WL	Nolif	Caf MiuM
5030K	600WL	Nolif	CwroMiuM
5030K	600WL	Nolif	Teaf
5030K	600WL	Nolif	NeleniuM
5030K	600WL	Nolif	NilAer
5030K	60W0K	Nolif	Lrsenic
5030K	60W0K	Nolif	KariuM
5030K	60W0K	Nolif	Caf MiuM
5030K	60W0K	Nolif	CwroMiuM
5030K	60W0K	Nolif	Copper
5030K	60W0K	Nolif	Teaf
5030K	60W0K	Nolif	Bickel
5030K	60W0K	Nolif	NeleniuM
5030K	60W0K	Nolif	NilAer
5030K	60W0K	Nolif	Zinc
2420L	2420L	Nolif	x ercurU
2421K	2421K	Nolif	x ercurU
8083L	6W45	Nolif	j CK-1015 (1C)
8083L	6W45	Nolif	j CK-1331 (1C)
8083L	6W45	Nolif	j CK-1363 (1C)
8083L	6W45	Nolif	j CK-1343 (1C)
8083L	6W45	Nolif	j CK-1348 (1C)
8083L	6W45	Nolif	j CK-13W4 (1C)
8083L	6W45	Nolif	j CK-13W4 (3C)
8083L	6W45	Nolif	j CK-1350 (1C)
8350D		Nolif	1,1-DicwloroetwAne
8350D		Nolif	1,3-DicwloroetwAne
8350D		Nolif	3-KutAnone
8350D		Nolif	KenzAne
8350D		Nolif	Carbon tetracwlorif e
8350D		Nolif	CwlorobenzAne
8350D		Nolif	CwlorovorM
8350D		Nolif	metracwloroetwAne
8350D		Nolif	mricwloroetwAne
8350D		Nolif	VinU cwlorif e

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC (Continued)

h nless otwerd ise notef , all analUtes vor twis laboratorUd ere coAeref unf er eacw accref itationSertivication belod .

Authority	Program	Identification Number	Expiration Date

mwe vollod ing analUtes are incluf ef in twis report, but twe laboratorUis not certivief bUtwe goAerning autworitU mwis list MaUincluf e analUtes vor d wicw twe agencUf oes not ower certivication.

LnalUsis x etwof	j rep x etwof	x atri7	LnalUte
8320E	6W10C	Nolif	1,4-Dicwlorobenzene
8320E	6W10C	Nolif	3,4,Wmricwloropwenol
8320E	6W10C	Nolif	3,4,5-mricwloropwenol
8320E	6W10C	Nolif	3,4-Dinitrotoluene
8320E	6W10C	Nolif	3-x etwUpwenol
8320E	6W10C	Nolif	4-x etwUpwenol
8320E	6W10C	Nolif	He7acwlorobenzene
8320E	6W10C	Nolif	He7acwlorobutaf iene
8320E	6W10C	Nolif	He7acwloroetwane
8320E	6W10C	Nolif	Bitrobenzene
8320E	6W10C	Nolif	j entacwloropwenol
8320E	6W10C	Nolif	j Urif ine
8320E NIx	6W45	Nolif	1-x etwUnapwtwalene
8320E NIx	6W45	Nolif	3-x etwUnapwtwalene
8320E NIx	6W45	Nolif	L cenapwtwene
8320E NIx	6W45	Nolif	L cenapwtwUene
8320E NIx	6W45	Nolif	L ntwracene
8320E NIx	6W45	Nolif	Kenzo[a]antwracene
8320E NIx	6W45	Nolif	Kenzo[a]pUrene
8320E NIx	6W45	Nolif	Kenzo[b]Vuorantwene
8320E NIx	6W45	Nolif	Kenzo[g,w,i]perUene
8320E NIx	6W45	Nolif	Kenzo[k]Vuorantwene
8320E NIx	6W45	Nolif	CwrUsene
8320E NIx	6W45	Nolif	Dibenz(a,w)antwracene
8320E NIx	6W45	Nolif	Fluorantwene
8320E NIx	6W45	Nolif	Fluorene
8320E NIx	6W45	Nolif	Inf eno[1,3,6-cf]pUrene
8320E NIx	6W45	Nolif	Bapwtwalene
8320E NIx	6W45	Nolif	j wenantwrene
8320E NIx	6W45	Nolif	j Urene
P013	2.6.4	Nolif	CUanif e, 9 eactiAe
P064	2.6.4	Nolif	Nulvif e, 9 eactiAe
x oisture		Nolif	j ercent x oisture
x oisture		Nolif	j ercent Nolif s

Method Summary

Method	Method Description	Protocol	Laboratory
VmC0D	doicain (Gct es I oM, opt) ELu I S7 Nv	N8 V4O	gTTg
Vm20g	NnMeHbicain (Gct es I oM, opt) ELu I S7 Nv	N8 V4O	gTTg
Vm20g NI7	NnMeHbicain (Gct es I oM, opt) ELu I S7 N NI7 v	N8 V4O	gTTg
B8 xj h-u w	BoGAk nEa- doicain j naGinpM j Go) psaELu I v	B8 xj h	gTTg
V0Vm9	j oiWAioGe can) Ke, Ant WELj I KEvbWu cEI AGoMcaor Gc, AW	N8 V4O	gTTg
B8 xj h-Dw	BoGAk nEa- NnMedoicain j naGinpM j Go) psaELu I v	B8 xj h	gTTg
C0m0K	7 naciELII j S7 Nv	N8 V4O	gTTg
24209	7 nGspGWLI d99v	N8 V4O	gTTg
2421K	7 nGspGWLI d99v	N8 V4O	gTTg
10109	Ir t eacbeleW j nt ERW7 cGnt EI ioEn)-I p, 7 naAo)	N8 V4O	gTTg
C01m	I Wct e) n. 3 ncsaHh	N8 V4O	gTTg
C064	Npife) n. 3 ncsaHh	N8 V4O	gTTg
7 oeEapGa	j nGsnt a7 oeEapGa	gj 9	gTTg
1611	xI Tj gwaGsaeot	N8 V4O	gTTg
60059	j Ga, cGcaeot . xoaci 3 nsoHhGbin oGDeEEoiHh) 7 naciE	N8 V4O	gTTg
6050K	j Ga, cGcaeot . 7 naciE	N8 V4O	gTTg
6510I	Teqpe) -Teqpe) gwaGsaeot LNn, cGcaoGWFpt t niv	N8 V4O	gTTg
654O	7 esGok cHh gwaGsaeot	N8 V4O	gTTg
6550I	UiaGEot es gwaGsaeot	N8 V4O	gTTg
5060I	j pGn ct) xGc,	N8 V4O	gTTg
5065	I ioEn) NWEanM j pGn ct) xGc,	N8 V4O	gTTg
2P6P6	I Wct e) n. 3 ncsaHh	N8 V4O	gTTg
2P6P4	Npife) n. 3 ncsaHh	N8 V4O	gTTg
24209	j Ga, cGcaeot . 7 nGspGW	N8 V4O	gTTg
2421K	j Ga, cGcaeot . 7 nGspGW	N8 V4O	gTTg

Protocol References:

gj 9 = UN gt HGot Mnt aci j Gansaeot 9r nt sW

B8 xj h = BoGAk nEaxoaci j naGinpM h W) GoscGbot

N8 V4O = "xnEa7 naAo) E FoGgHcipcatr Noie) 8 cEan. j AWEesci$ AnMesci 7 naAo) E". xAeG g) eaeot . BoHhMbnG1CVO9t) laE U,) canEP

Laboratory References:

gTTg = gpGofel E Tct scEanGTcboGcaoGnE gt HGot Mnt axnEaer . TTI . m4m5 Bnk hoiict) j eRn. Tct scEanGj 9 12C01. xgT L212vC5O-m600

Sample Summary

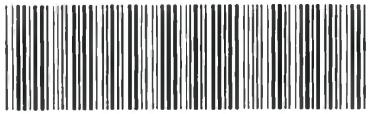
Client: Jacobs Engineering Group, Inc.
Project/Site: NBK Keyport

Job ID: 410-103779-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
410-103779-1	NBKK-IDW01-SO-102722	Solid	10/27/22 13:00	10/29/22 10:00
410-103779-2	NBKK-IDW02-SO-102722	Solid	10/27/22 13:45	10/29/22 10:00
410-103779-3	NBKK-IDW03-SO-102722	Solid	10/27/22 14:15	10/29/22 10:00

Eurofins Lancaster Laboratories Environme
2425 New Holland Pike
Lancaster, PA 17601
Phone: 717-656-2300 Fax: 717-656-2681

Chain of Custody Record



410-103779 Chain of Custody

eurofins Environment Testing America

Client Information	Sampler: Griffin Riley	Lab PM: Martin, Elizabeth	COC No: 410-67544-19586.1
Client Contact: Kim Shiroodi	Phone: 503-410-1217	E-Mail: Elizabeth.Martin@et.eurofinsus.com	Page: Page 1 of 1
Company: Jacobs Engineering Group, Inc.	PWSID:		Job #:
Address: 8735 W Higgins Road Suite 400	Due Date Requested:	Analysis Requested	Preservation Codes:
City: Chicago	TAT Requested (days):		A - HCL; B - NaOH; C - Zn Acetate; D - Nitric Acid; E - NaHSO4; F - MeOH; G - Amchlor; H - Ascorbic Acid; I - Ice; J - DI Water; K - EDTA; L - EDA; M - Hexane; N - None; O - AsNaO2; P - Na2O4S; Q - Na2SO3; R - Na2S2O3; S - H2SO4; T - TSP Dodecahydrate; U - Acetone; V - MCAA; W - pH 4-5; Y - Trizma; Z - other (specify); Other:
State, Zip: IL, 60631	Compliance Project: Δ Yes Δ No		
Phone: 352-384-7002(Tel)	PO #: Purchase Order Requested		
Email: Kim.Shiroodi@jacobs.com	WO #:		
Project Name: NBK Keyport	Project #: 41012633		
Site:	SSOW#:		

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Preservation Code:	Filtered Sample (Yes or No)	NWTPH_Gx - NWTPH_Gx (GRO)	6020B_DOD5, 7471B_DOD5, 8082A_DOD5, 8270E_SIM_DOD5, 9012_ReactiveCN, 9034_Reactive,	8260D_DOD5 - 8260D_DOD5 (TCLP VOCs)	6020B_DOD5, 7470A_DOD5, 8270E_DOD5	Number of containers	Special Instructions/Note:
						F	N	1	2	1	1	
NBKK-IDW01-SO-102722	10/27	1300	C	S		N	N	1	2	1	1	
NBKK-IDW02-SO-102722	10/27	1345	C	S		N	N	1	2	1	1	
NBKK-IDW03-SO-102722	10/27	1415	C	S		N	N	1	2	1	1	

Possible Hazard Identification
☐ *Non-Hazard* ☐ *Flammable* ☐ *Skin Irritant* ☐ *Poison B* ☐ *Unknown* ☐ *Radiological*

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
Kara Hunt	10-13-22 10:47	ELE			
Griffin Riley	10/28 1300	Jacobs			
				10/29/22 1000	

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 0.9

Login Sample Receipt Checklist

Client: Jacobs Engineering Group, Inc. Job Number: 410-103779-1

Login Number: 103779 **List Source: Eurofins Lancaster Laboratories Environment Testing, LLC**
List Number: 1
Creator: McBeth, Jessica

Question	Answer	Comment
The cooler's custody seal is intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable (</=6C, not frozen).	True	
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	True	
Sample custody seals are intact.	N/A	
VOA sample vials do not have headspace >6mm in diameter (none, if from WV)?	N/A	

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Juan Acaron
Jacobs Engineering Group, Inc.
3011 SW Willston Road
Gainesville, Florida 32608-3964

Generated 2/2/2023 12:15:10 PM

JOB DESCRIPTION

NBK Keyport

JOB NUMBER

410-104274-1

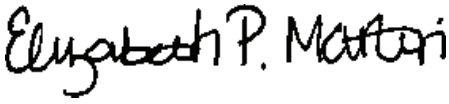
Eurofins Lancaster Laboratories Environment Testing, LLC
2425 New Holland Pike
Lancaster PA 17601

See page two for job notes and contact information.

Job Notes

Analytical test results meet all requirements of the associated regulatory program (i.e., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis.

Authorization



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2/2/2023 12:15:10 PM

Authorized for release by
Elizabeth Martin, Project Manager
Elizabeth.Martin@et.eurofinsus.com
(717)205-3949

Compliance Statement

Analytical test results meet all requirements of the associated regulatory program (e.g., NELAC (TNI), DoD, and ISO 17025) unless otherwise noted under the individual analysis. Data qualifiers are applied to note exceptions. Noncompliant quality control (QC) is further explained in narrative comments.
· QC results that exceed the upper limits and are associated with non-detect samples are qualified but further narration is not required since the bias is high and does not change a non-detect result. Further narration is also not required with QC blank detection when the associated sample concentration is non-detect or more than ten times the level in the blank.
· Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD is performed, unless otherwise specified in the method.
· Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.
Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Measurement uncertainty values, as applicable, are available upon request.

Test results relate only to the sample tested. Clients should be aware that a critical step in a chemical or microbiological analysis is the collection of the sample. Unless the sample analyzed is truly representative of the bulk of material involved, the test results will be meaningless. If you have questions regarding the proper techniques of collecting samples, please contact us. We cannot be held responsible for sample integrity, however, unless sampling has been performed by a member of our staff. Times are local to the area of activity. Parameters listed in the 40 CFR Part 136 Table II as "analyze immediately" and tested in the laboratory are not performed within 15 minutes of collection.

WARRANTY AND LIMITS OF LIABILITY - In accepting analytical work, we warrant the accuracy of test results for the sample as submitted. The foregoing express warranty is exclusive and is given in lieu of all other warranties, expressed or implied, except as otherwise agreed. We disclaim any other warranties, expressed or implied, including a warranty of fitness for particular purpose and warranty of merchantability. In no event shall Eurofins Lancaster Laboratories Environmental, LLC be liable for indirect, special, consequential, or incidental damages including, but not limited to, damages for loss of profit or goodwill regardless of (A) the negligence (either sole or concurrent) of Eurofins Lancaster Laboratories Environmental and (B) whether Eurofins Lancaster Laboratories Environmental has been informed of the possibility of such damages. We accept no legal responsibility for the purposes for which the client uses the test results. Except as otherwise agreed, no purchase order or other order for work shall be accepted by Eurofins Lancaster Laboratories Environmental which includes any conditions that vary from the Standard Terms and Conditions, and Eurofins Lancaster Laboratories Environmental hereby objects to any conflicting terms contained in any acceptance or order submitted by client.

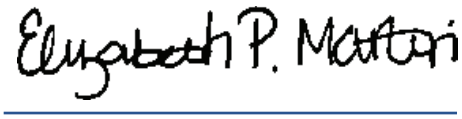

Table of Contents

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Job ID: 410-104274-1

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC

Narrative

Job Narrative
410-104274-1

Receipt
The sample was received on 11/3/2022 10:15 AM. Unless otherwise noted below, the sample arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 9.2°C.

Receipt Exceptions
The following sample was received at the laboratory outside the required temperature criteria: NBKK-IDW04-AQ-110122 (410-104274-1). This does not meet regulatory requirements. The client was notified and per instruction 11/04/22 8:59 PM, the lab should move forward with the analysis.

SUBCONTRACTING
The following analysis was subcontracted to ALS Environmental: Total Organic Halogens

Subcontract Lab non-Sister Lab
See attached subcontract report.

Client Sample Results

Client: Jacobs Engineering Group, Inc.
Project/Site: NBK Keyport

Job ID: 410-104274-1

Client Sample ID: NBKK-IDW04-AQ-110122
Date Collected: 11/01/22 14:45
Date Received: 11/03/22 10:15

Lab Sample ID: 410-104274-1
Matrix: Water
Percent Solids: 0

Method: EPA 9020B - EPA 9020B TOX
Lab: ALS Environmental - Middletown, PA

Analyte	Result	Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Halogen, Total Organic (TOX)	27.7		16			ug/L	☼	12/30/22 12:59	1

Client: Jacobs Engineering Group, Inc.
Project/Site: NBK Keyport

Job ID: 410-104274-1

Method: EPA 9020B - EPA 9020B TOX

Lab Sample ID: 3606317
Matrix: Drinking W
Analysis Batch: 930931

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 930931_P

Analyte	Blank Result	Blank Qualifier	LOQ	LOD	DL	Unit	D	Analyzed	Dil Fac
Halogen, Total Organic (TOX)	ND	U	8			ug/L	☼	12/30/22 12:59	1

QC Association Summary

Client: Jacobs Engineering Group, Inc.
Project/Site: NBK Keyport

Job ID: 410-104274-1

Subcontract

Analysis Batch: 930931

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-104274-1	NBKK-IDW04-AQ-110122	Total/NA	Water	EPA 9020B	930931_P
3606317	Method Blank	Total/NA	Drinking W	EPA 9020B	930931_P

Prep Batch: 930931_P

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
410-104274-1	NBKK-IDW04-AQ-110122	Total/NA	Water	NA	
3606317	Method Blank	Total/NA	Drinking W	NA	

Lab Chronicle

Client: Jacobs Engineering Group, Inc.
Project/Site: NBK Keyport

Job ID: 410-104274-1

Client Sample ID: NBKK-IDW04-AQ-110122
Date Collected: 11/01/22 14:45
Date Received: 11/03/22 10:15

Lab Sample ID: 410-104274-1
Matrix: Water
Percent Solids: 0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	NA		1	930931_P		ALS MTown	12/30/22 12:59
Total/NA	Analysis	EPA 9020B		1	930931	PAG	ALS MTown	12/30/22 12:59

Laboratory References:

ALS MTown = ALS Environmental - Middletown, PA, 301 Fulling Mill Road, Middletown, PA 17057

Method Summary

2 Ct en Jt aobc s eElei i gleE r gpCuplea,
. gpSamNBln : Ky P Pi j uogn

Job ID: 410-104384-1

Method	Method Description	Protocol	Laboratory
7030y	s . W7030y 69 A	B/ T4O	WXB L 6oMe

Protocol References:

B/ T4Ow=6i cnL i n'ohc dogs Ft CCt nleE BoCh / t cni p. "j clat CX "i v lat CL i n'ohc=p6" lgh s hlnloepKoFi v bi g17TOWeh lnc muht ni c,

Laboratory References:

WXB L 6oMe w WXB s eFlgpev i ert C- L lhhCnoMep. WpU01 dGCCeE L lCCRot hpL lhhCnoMep. W18058

Sample Summary

Client: Jacobs Engineering Group, Inc.
Project/Site: NBK Keyport

Job ID: 410-104274-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
410-104274-1	NBKK-IDW04-AQ-110122	Water	11/01/22 14:45	11/03/22 10:15

301 Fulling Mill Road | Middletown, PA 17057 | Phone: 717-944-5541 | Fax: 717-944-1430 | www.alsglobal.com

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343

Analytical Results Report For **Eurofins Lancaster Laboratories Environmental, LLC**

Project LLL114|410-104274-1
Workorder 3279712
Report ID 217124 on 1/5/2023

Certificate of Analysis

Enclosed are the analytical results for samples received by the laboratory on Nov 08, 2022.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Sarah Leung (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

ALS Middletown: 301 Fulling Mill Road, Middletown, PA 17057 : 717-944-5541.

Recipient(s):
ENV Subcontracting - Lancaster Laboratories

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.

Sarah Leung

Sarah Leung *(ALS Digital Signature)*
Project Coordinator

Sample Summary

Lab ID	Sample ID	Matrix	Date Collected	Date Received	Collector	Collection Company
3279712001	NBKK-IDW04-AQ-110122	Water	11/01/2022 14:45	11/08/2022 12:14	CBC	Collected By Client

Reference

Notes

- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
- Except as qualified, Clean Water Act sample analyses are consistent with methodology requirements in 40 CFR Part 136.
- Except as qualified, Safe Drinking Water Act sample analyses are consistent with methodology requirements in 40 CFR Part 141.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are preformed in the laboratory and are therefore analyzed out of hold time.
- Method references listed on this report beginning with the prefix “S” followed by a method number (such as S2310B-97) refer to methods from “Standard Methods for the Examination of Water and Wastewater”.
- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND) above the MDL
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Practical Quantitation Limit for this Project
ND	Not Detected - indicates that the analyte was Not Detected
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits
#	Please reference the result in the Results Section for analyte-level flags.

Project Notations

Sample Notations

Lab ID	Sample ID

Result Notations

Notation Ref.

Detected Results Summary

Client Sample ID	NBKK-IDW04-AQ-110122	Collected	11/01/2022 14:45
Lab Sample ID	3279712001	Lab Receipt	11/08/2022 12:14

Compound	Result	Units	LOQ	LOD	DL	Method	Flag
WET CHEMISTRY							
Halogen, Total Organic (TOX)	27.7	ug/L	20.0	16.0	7.8	SW846 9020B	#

Results

Client Sample ID	NBKK-IDW04-AQ-110122	Collected	11/01/2022 14:45
Lab Sample ID	3279712001	Lab Receipt	11/08/2022 12:14

WET CHEMISTRY

Compound	Result	Flag	Units	LOQ	LOD	DL	Method	Dilution	Analysis Date/Time	By	Cntr
Halogen, Total Organic (TOX)	27.7		ug/L	20.0	16.0	7.8	SW846 9020B	1	12/30/2022 12:59	PAG	A

Sample - Method Cross Reference Table

Lab ID	Sample ID	Analysis Method	Preparation Method	Leachate Method
3279712001	NBKK-IDW04-AQ-110122	SW846 9020B	N/A	

QUALITY CONTROL SAMPLES

WET CHEMISTRY

QC Batch

QC Batch	930931	Prep Method	N/A
Date	N/A	Analysis Method	SW846 9020B
Tech.			

Associated Samples

3279712001

Matrix Spike 3606321 (MS) 3279716004 (non-Project Sample) For QC Batch 930931

****NOTE - The Original Result shown below is a raw result and is only used for the purpose of calculating Matrix Spike percent recoveries. This result is not a final value and cannot be used as such.

RESULTS

Compound	CAS No		Result (ug/L)	Orig. Result (ug/L)	Spk Added (ug/L)	Rec. (%)	Limits (%)	RPD Limit (%)	Qualifie
Halogen, Total Organic (TOX)	TOX	MS	208	17.50	200	95.2	80 - 120		

Method Blank 3606317 (MB) Created on 12/30/2022 12:57 For QC Batch 930931

RESULTS

Compound	CAS No		Result	Units	LOQ	Qualifiers
Halogen, Total Organic (TOX)	TOX	BLK	8.0U	ug/L	10.0	U

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Lab ID	Sample ID	Areparayi Mt eyhi o	Arep dayPh	Arep Daye32sme dc	r Malc7s7 t eyhi o	r Mc dayPh
910N0B1KKB	- dWW4IDQ K/ 4r 8 4BBKB11	- 3-	- 3-	- 3-	SQ 6/ f NK1Kd	N9KN9B

Eurofins Lancaster Laboratories Environme
2425 New Holland Pike
Lancaster, PA 17601
Phone: 717-656-2300 Fax: 717-656-2681

Chain of Custody Record

3279712
Logged By: SSL
PM: SSL

eurofins Environment Testing

Client Information (Sub Contract Lab)			
Client Contact: Shipping/Receiving	Sampler:	Lab PM: Martin, Elizabeth	COC No: 410-1765203.1
Company: ALS Environmental	Phone:	E-Mail: Elizabeth.Martin@et.eurofinsus.com	Page: Page 1 of 1
Address: 301 Fulling Mill Road,	Due Date Requested: 11/17/2022	Accreditations Required (See note): Dept. of Defense ELAP - A2LA; State - Washington	Job #: 410-104274-1
City: Middletown	TAT Requested (days):		
State, Zip: PA, 17057			
Phone:	PO #:		
Email:	WO #:		
Project Name: NBK Keyport	Project #: 41012633		
Site:	SSOW#:		

State: Washington

Analysis Requested

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	SUB (Total Organic Halogens - 12-day TAT)/ EPA 9020B	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
NBKK-IDW04-AQ-110122 (410-104274-1)	11/1/22	14:45 Pacific		Water			X	1	See Attached Instructions

Preservation Codes:
A - HCL
B - NaOH
C - Zn Acetate
D - Nitric Acid
E - NaHSO4
F - MeOH
G - Amchlor
H - Ascorbic Acid
I - Ice
J - DI Water
K - EDTA
L - EDA
M - Hexane
N - None
O - AsNaO2
P - Na2O4S
Q - Na2SO3
R - Na2S2O3
S - H2SO4
T - TSP Dodecahydrate
U - Acetone
V - MCAA
W - pH 4-5
Y - Trizma
Z - other (specify)
Other:

Temp Taken By: KSB
WO Temp (°C): 2
Therm ID: 570
Receipt Info Completed By: KSB
Cooler Custody Seal Intact: Y N (NA)
Sample Custody Seal Intact: Y N (NA)
Received on Ice: (Y) N NA
Cooler & Samples Intact: Y N
Correct Containers Provided: Y N
Sample Label/COC Agree: Y N
Adequate Sample Volumes: Y N
VOA Headspace Present: Y N (NA)
Voa Trip Blank: Y N (NA)
NJ≤ 4 Days?: Y N
Rad Screen (uCi):
Courier/Tracking #:
SDWA Compliance: Y (N)
PWSID
WV Containers 0-6°C: Y N (NA)
1x A/H2SO4 no g-c
Client Collector

Note: Since laboratory accreditations are subject to change, Eurofins Lancaster Laboratories Environment Testing, LLC places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Lancaster Laboratories Environment Testing, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Lancaster Laboratories Environment Testing, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins Lancaster Laboratories Environment Testing, LLC.

Possible Hazard Identification
Unconfirmed

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* ______ *Months*

Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2

Special Instructions/QC Requirements:

Empty Kit Relinquished by: Date: Time: Method of Shipment:

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
[signature]	11/7/22 1340	ALLT	[signature]	11/8/22 0936	
[signature]	11/8/22 1214		[signature]	11.8.22 1214	

Custody Seals Intact: | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

Eurofins Seattle
~~5755 8th Street East~~
~~Tacoma, WA 98424~~
~~Phone (253) 922-2310~~
#2425 New Holland Pike
Lancaster PA 17601

410-104274 Chain of Custody

ord

eurofins | Environment Testing America

Client Information	Jordan Peery-Lemon	~~Dutton, Tracy L~~ Martin, Elizabeth	Carrier Tracking No(s):	COC No: 580-48044-15408.1
Client Contact: ~~Gail DeRuzzo~~ Juan Acaron	Phone: 425.633.5823	E-Mail: ~~Tracy.Dutton@et.eurofinsus.com~~ Elizabeth.Martin@ET.eurofinsus.com	~~State of Origin:~~	Page: Page
Company: ~~Battelle~~ Jacobs	PWSID:			Job #:

Address: ~~PO BOX 84262~~ 3011 SW Winston Road	Due Date Requested:	
City: ~~Seattle~~ Gainesville	TAT Requested (days):	
~~State, Zip: WA, 98124-5562~~ FL, 32608.3964	Compliance Project: Δ Yes Δ No	
Phone: 352 384 7002	PO #: Purchase Order Requested	
Email: ~~deruzzo@battelle.org~~ Juan.Acaron@Jacobs.com	WO #:	
Project Name: ~~OU1 at~~ NBK Keyport ~~(RFP) 22-0773~~	Project #: 58017858	
Site:	SSOW#:	

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	~~Moisture - Local Method~~	~~8260D_DOD5 - CVOCs + Chloroethane~~	~~8270E_SIM_ID_D5 - 1,4-Dioxane~~ (Dil)	~~9060A - TOC~~	~~1668C_DOD5 - PCB Congeners, full list~~	~~8082A_DOD5 - (MOD) PCBs, standard list~~	~~8260B_DOD5_LL - Volatiles~~ (Equipment Blanks only)	TOX - 9020						Total Number of containers	Special Instructions/Note:
			Preservation Code:		X	X	N	J	N	N	N	N	A							X	
NBKK-IDW04-AQ-110122	11/1/22	1445	G	W										1							

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For ________ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Jordan Peery Lemon Jordan Peery Lemon	11/2/22 1200	Jacobs			
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by: [signature]	Date/Time: 11-3-22 1015	Company: EUS

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 9.2

Ver: 01/16/2019

JM

AO 2/2/2023

Login Sample Receipt Checklist

Client: Jacobs Engineering Group, Inc. Job Number: 410-104274-1

Login Number: 104274 **List Source: Eurofins Lancaster Laboratories Environment Testing, LLC**
List Number: 1
Creator: McCaskey, Jonathan

Question	Answer	Comment
The cooler's custody seal is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable (</=6C, not frozen).	False	Cooler temperature outside required temperature criteria.
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable (</=6C, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	True	
Sample custody seals are intact.	N/A	
VOA sample vials do not have headspace >6mm in diameter (none, if from WV)?	N/A	

CTO-4117: Northwest PFAS Investigation
Project No G25161.X1.XX.0026.000001
PFAS by DoD QSM 5.3 Table B-15

W

Batch 23-1034

Package DP-23-1138

Submitted to:
CH2M
5701 Cleveland Street
Virginia Beach, VA 23462 USA

Submitted by:
Battelle Norwell Operations
141 Longwater Drive Suite 202
Norwell, MA 02061

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CTO-4117: Northwest PFAS Investigation
Project No G25161.X1.XX.0026.000001
PFAS by DoD QSM 5.3 Table B-15

W

Batch 23-1034

Package DP-23-1138

Submitted to:
CH2M
5701 Cleveland Street
Virginia Beach, VA 23462 USA

NELAP Accreditation Number: E87856 (Florida Department of Health)
DoD-ELAP Accreditation Number: 91667

Submitted by:
Battelle Norwell Operations
141 Longwater Drive Suite 202
Norwell, MA 02061

Analyst Approval: Vincent Urso 2023.08.23 10:55:57 -04'00'

QC Chemist Approval: Deb Huntress 2023.08.24 12:55:04 -04'00'

Project Manager Approval: Digitally signed by Robert Lizotte, Jr. Date: 2023.08.24 13:07:04 -04'00'

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CTO-4117: Northwest PFAS Investigation
Project No G25161.X1.XX.0026.000001
PFAS by DoD QSM 5.3 Table B-15

W

Batch 23-1034

Package DP-23-1138

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Master Signature Page

Name (Printed)	Signature	Initials	Date
Jonathan Thorn		JRT	1/9/2020
Robert Lizotte, Jr.		BL	1.9.2020
Elyn M Fitch		EMF	1/9/2020
Carla Devine		CRD	1/9/2020
Denise Schumitz		DS	1/9/2020
Lauren Griffith		LMG	1.9.2020
Carrie P McCarthy		CPM	1/9/2020
Rich Restuccia		RR	1/9/2020
Sam Guimaraes		SAG	1/9/2020
Jordan Tower		JLT	1/9/2020
Christie Usher		CU	1/9/2020
Kevin McInerney		KM	1/14/2020
Matt Schumitz		MDS	1/14/2020
Weidong Li		W.L	1/14/2020
Kayla Lamarre		KAL	1/14/2020
MUNAZ MUNTASIR		MM	01/14/2020
Kristen Nichols		KN	01/14/2020
Kelsey Harnden		KH	01/30/2020
Kevin Bailey		KB	1/30/2020
Stephanie Schultz		SAS	1/30/2020

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Master Signature Page

Name (Printed)	Signature	Initials	Date
Clinicea Brown		CB	01/30/20
Ryan Kelly		RK	01/30/20
KAREN HYPPOLITE		K.H.	01/31/20
Gail DeRuzzo		GD	01/31/2020
Tracy Stenner			1/31/2020
Ashley Wellington		AW	1131/2020
Daniel Cooney		DAC	1/31/2020
Peter Demers		PD	1/31/2020
Andy Delmar		AD	3/19/2021
Emily Reardon		ER	3/19/2021
Brenton Murphy		Bm	3/19/2021
Haley Hart		H H	3/19/21
Allison Wamaess		AW	3/19/21
Taylor Noonan		TN	3/19/21
FRANCO PALA		FP	3/19/21
Amina Chamanlal		AC	11/03/21
J Michelle Wentzell		MW	11-3-21
Zachary Dreiker		ZD	11/3/21
Drew Croke		DC	11/3/21
Zachary Willenberg		ZW	11/3/21

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Master Signature Page

Name (Printed)	Signature	Initials	Date
Hayley Beal	Hayley Beal	HB	5/9/2022
Nathaniel Kinsman	Nathaniel Kinsman	NK	5/9/2022
Debra Huntress	Debra Huntress	DHU	5/9/22
Vincent Urso	Vincent Urso	VU	5/9/22

Sample Summary

Client: CH2M (Jacobs)
SDG: 23-1034
Project/Site: NBK Keyport
CTO: 4117

Lab Sample ID	Client Sample ID	Matrix	Collection Date	Receipt Date
DO701PB-FS	Procedural Blank	WATER	8/18/2023	8/18/2023
DO702LCS-FS	Laboratory Control Sample	WATER	8/18/2023	8/18/2023
D7902-FS	NBKK-B76-IDW01-AQ-081623	W	8/16/2023	8/17/2023
D7903-FS	NBKK-B76-IDW02-AQ-081623	W	8/16/2023	8/17/2023

Work Plan

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WORK/QUALITY ASSURANCE PROJECT PLAN

1.0 GENERAL PROJECT INFORMATION

Project Title:	CTO-4117: NBK Keyport PFAS in water
Project Number:	G25161.X1.XX.0026.000001
Client:	CH2M 5701 Cleveland Street Suite 200 Virginia Beach, VA 23462 USA
Client Contact Information:	Juan Acaron Project Chemist (352) 331-8121(V) NA juan.acaron@jacobs.com
Effective Date of QAPP:	9/12/2022
Version Number:	G25161.X1.XX.0026.000001(L)-11
Project Manager:	Thorn, Jonathan
Laboratory Task Manager:	Thorn, Jonathan
Deliverable Due Date:	10/14/2022

2.0 SCOPE OF WORK

Overview:	Analysis of water samples for PFAS (18 Analytes)
Matrix:	Water

2.1 TECHNICAL APPROACH

2.1.1 Sample Receipt, Storage, and Handling

The list of samples for this project plan are presented in Attachment 1.

Storage Directions:	Store refrigerated.
Sub_Sampling:	None
Procedures:	NA
Contact:	NA
Comment:	NA
Archiving:	Dispose of excess samples after six months.
Disposal:	Dispose of excess samples in the appropriate waste stream.

2.1.2 Sample Preparation

None.

Samples Expected:	Samples Per Batch:	Batches Expected:
20	20	1

Batch quality control samples are defined in Table 1.

Target samples are presented in Attachment 1.

Table 1: Quality Control Samples

Type:	*Description:*	*Count:*	*Rgt:*	*Reference:*	*Comment:*
PB	Laboratory control reagent blank.	1 per batch	--	NA	
LCS	Laboratory Control Sample	1 per batch	No	NA	
MS	Spiked field sample for determining method accuracy in the presence of matrix.	1 per batch	--	NA	
MSD	Spiked field sample for determining method accuracy and precision in the presence of matrix.	1 per batch	--	NA	

2.1.3 Extraction/Preparation

2.1.3.1 Extraction

SOP No.-Rev:	**5-370-13**
SOP Title:	*Extraction of Poly and Perfluoroalkyl Substances from Environmental Matrices*
Sample Size:	250.00 ml
SIS and LCS/MS Compounds:	Defined in Table 2.
Deviations:	None.
Comments:	None.

Table 2: SIS and LCS/MS Spiking Level

Standard Type	Standard Contents		Spike Amount (ng)	Volume (uL)	Comment
PFAS DoD Surrogate (18 Targets)	LS23	SIS	~ 25.0 ng	50 uL	NA
PFAS DoD Second Source LCS/MS (18	LR93	LCS/MS	~ 40 ng	100 uL	Vary spike between 25 and 150 µL

Standard Type	Standard Contents	Spike Amount (ng)	Volume (uL)	Comment
Analytes)				

2.1.3.2 Cleanup

None.

RIS spiking levels are presented in Table 3.

Extract PIV (uL): 5000

Table 3: RIS Spiking Level

Standard Type	Standard Contents	Spike Amount (ng)	Volume (uL)	Comment
PFAS DoD Internal Standards	LS03 RIS	~ 25.0 ng	50 uL	NA

2.1.4 Instrumental Analysis

The list of analytes along with data quality criteria are presented in Attachment 2.

1) SOP_No-Rev: **5-369-09**

SOP_Title: *Analysis of Perfluoroalkyl Substances in Environmental Samples by Liquid Chromatography and Tandem Mass Spectrometry (LC-MS/MS)*

Deviations: None

Comments: None

2.2. DELIVERABLES

Deliverables Due:	10/14/2022
LIMS Reports:	*No*
Histograms:	*No*
Excel Tables:	*No*
EICs:	*No*
Chromatograms:	*No*
EDDs:	*No*
Comments:	• Individual data sets will be due 28 days after receipt of each sample set. • Select data sets have expedited TAT. • Full Level 4 data package (QSM 5.3 Table B-15 compliant) required.

- CH2M EDD required.
- WO 148003519

3.0 QUALITY

The Method Quality Objectives are defined in Attachment 3.

4.0 ORGANIZATION AND COMMUNICATION

4.1 ORGANIZATION

The project team is defined in Table 4. Supervisors may make substitutions with Project Manager concurrence.

Table 4: Project Team and Roles

Staff Member	Role	Comment
Jonathan R. Thorn	Project Manager	NA
Kelsey Harnden	Sample Preparation	NA
Denise M. Schumitz	LC-MS/MS Analysis	NA
Matt D. Schumitz	Sample Custody	NA
Carla R. Devine	Quality Control Officer	NA
Zachary J. Willenberg	Quality Assurance Officer	NA

4.2 COMMUNICATION

A kick-off meeting will be held to discuss project scope and goals.

5.0 SCHEDULE

The project schedule is presented in Table 5.

Table 5. Schedule of Laboratory Activities

Activity:	Start Date:	End Date:	TAT (days):	Comment:
Sample Receipt	09/12/2022	09/12/2022	0	NA
Sample Preparation	09/12/2022	09/30/2022	18	NA
Instrument Analysis	09/30/2022	10/13/2022	13	NA
Quality Control Review	10/13/2022	10/14/2022	1	NA
Quality Assurance Review	10/14/2022	10/14/2022	0	NA

6.0 BUDGET

The labor budget for the analytical task is presented in Table 6.

Table 6. Labor Budget (Laboratory Analytical Task)

Labor Activity:	Hours/ Batch:	Batches:	Total Hours:	Comment:
Sample Receipt	2	1	2	Hours per 12 samples
Sample Preparation	5	1	5	Hours per 12 samples
Instrument Analysis	5	1	5	Hours per 12 samples
Quality Control Review	2	1	2	1.5 hours per 12 samples
Quality Assurance Review	1	1	1	Hours per 12 samples

7.0 STAFF DEVELOPMENT

None anticipated.

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WORK/QUALITY ASSURANCE PROJECT PLAN

Attachment 1: Target Samples

Shipment: **SHP-230131-01**

Status: Pending

Description: NBK Keyport

Range: D2265-D2274

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	D2265	NBKK-IDW11-AQ-012523	01/25/2023 1:00 pm	WATER	R0119 (NA)			
2	D2266	NBKK-IDW12-AQ-012523	01/25/2023 1:15 pm	WATER	R0119 (NA)			
3	D2267	NBKK-IDW13-AQ-012523	01/25/2023 1:30 pm	WATER	R0119 (NA)			
4	D2268	NBKK-IDW14-AQ-012523	01/25/2023 1:45 pm	WATER	R0119 (NA)			
5	D2269	NBKK-IDW15-AQ-012523	01/25/2023 12:45 pm	WATER	R0119 (NA)			
6	D2270	NBKK-IDW16-AQ-012523	01/25/2023 12:30 pm	WATER	R0119 (NA)			
7	D2271	NBKK-IDW17-AQ-012523	01/25/2023 12:15 pm	WATER	R0119 (NA)			
8	D2272	NBKK-IDW18-AQ-012523	01/25/2023 12:00 pm	WATER	R0119 (NA)			
9	D2273	NBKK-IDW19-AQ-012523	01/25/2023 11:45 am	WATER	R0119 (NA)			
10	D2274	NBKK-IDW20-AQ-012523	01/25/2023 11:20 am	WATER	R0119 (NA)			

Shipment: **SHP-230602-03**

Status: Pending

Description: NBK Keyport

Range: D5396-D5398

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	D5396	NBKK-OU2A2-MW01-0623	06/01/2023 12:15 pm	AQ	R0119 (NA)	BIN	371	
2	D5397	NBKK-OU2A2-EB01-060123-GW	06/01/2023 12:30 pm	AQ	R0119 (NA)	BIN	371	
3	D5398	NBKK-OU2A2-FB01-060123	06/01/2023 12:00 am	AQ	R0119 (NA)	BIN	371	

Shipment: **SHP-230811-04**

Status: Pending

Description: Keyport-BLDG 76

Range: D7463-D7478

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	D7463	NBKK-EB01-080823	08/08/2023 3:50 pm	WATER	F0115 (NA)			

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WORK/QUALITY ASSURANCE PROJECT PLAN

Shipment: **SHP-230811-04**

Status: Pending

Description: Keyport-BLDG 76

Range: D7463-D7478

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
2	D7464	NBKK-EB01-080923	08/09/2023 4:00 pm	WATER	F0115 (NA)			
3	D7478	NBKK-EB02-080923	08/09/2023 5:00 pm	WATER	F0115 (NA)			

Shipment: **SHP-230817-04**

Status: Pending

Description: Keyport BLDG76

Range: D7881-D7903

Comment: NA

No:	BDO Id:	Client Sample ID:	Collection Date:	Matrix:	Storage Facility:	Location:	No:	Comments:
1	D7881	NBKK-B76-FB01-081123	08/11/2023 1:51 pm	WATER	R0119 (NA)	BIN	482	
2	D7882	NBKK-B76-EB01-081123	08/11/2023 1:25 pm	WATER	R0119 (NA)	BIN	482	
3	D7888	NBKK-B76-EB01-081023	08/10/2023 5:30 pm	WATER	R0119 (NA)	BIN	482	
4	D7893	NBKK-B76-MW06-0823	08/14/2023 3:17 pm	WATER	R0119 (NA)	BIN	482	
5	D7894	NBKK-B76-MW06P-0823	08/14/2023 3:12 pm	WATER	R0119 (NA)	BIN	482	
6	D7895	NBKK-B76-FB01-081423	08/14/2023 4:21 pm	WATER	R0119 (NA)	BIN	482	
7	D7896	NBKK-B76-MW08-0823	08/15/2023 9:49 am	WATER	R0119 (NA)	BIN	482	
8	D7897	NBKK-B76-MW07-0823	08/15/2023 1:51 pm	WATER	R0119 (NA)	BIN	482	
9	D7898	NBKK-B76-EB01-081523	08/15/2023 1:56 pm	WATER	R0119 (NA)	BIN	482	
10	D7899	NBKK-B76-MW09-0823	08/14/2023 4:13 pm	WATER	R0119 (NA)	BIN	482	
11	D7900	NBKK-B76-MW09-0823-MS	08/14/2023 4:13 pm	WATER	R0119 (NA)	BIN	482	
12	D7901	NBKK-B76-MW09-0823-MSD	08/14/2023 4:13 pm	WATER	R0119 (NA)	BIN	482	
13	D7902	NBKK-B76-IDW01-AQ-0816823	08/16/2023 11:20 am	W	R0119 (NA)	BIN	482	
14	D7903	NBKK-B76-IDW02-AQ-0816823	08/16/2023 11:57 am	W	R0119 (NA)	BIN	482	

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It can be done

WORK/QUALITY ASSURANCE PROJECT PLAN

Attachment 2: Test Codes

Project Test Code Name:	Master_369D
SOP Reference:	5-369 - Analysis of Perfluoroalkyl Substances in Environmental Samples by Liquid Chromatography and Tandem Mass Spectrometry (LC-MS/MS)
Description:	PFAS by DoD QSM 5.3 Table B-15
Matrix:	L - Liquid Samples, like water or sea water, prepared and anlyzed under the same class of detection limits.
Detection Limit Study:	5-369
Instrument:	LC-MS/MS
MQO Criteria	Universal_LC
Standard Report:	Standard Result Report

Method Specific Reporting				Holding Times (days)		Data Flags	
Result Units:	ng/L	***Unit Conversion:***	(none)	***Sample:***	14	***DL_Flag:***	U
Weight Basis:	LIQUID	***Result Format:***	Fixed Digits	***Frozen:***	14	***RL_Flag:***	J
Standard Basis:	SIS	***# of Figures/Digits:***	2	***Extract:***	28	***PB_Flag:***	B
Oil Weight Basis:	No	***Oil Weight Source:***	Oil Weight			***DIL_Flag:***	D
U-Value Substition:	U-Flag=MD	***Histograms:***	No			***HT_Flag:***	T
ECD_Reporting:	No						

No:	Analyte:	Report Name:	Type	RIS	SIS	Hidden:	Graph:
1	Perfluoro-n-hexanoic acid	PFHxA	T		13C5-PFHxA	No	No
2	Perfluoro-n-heptanoic Acid	PFHpA	T		13C4-PFHpA	No	No
3	Perfluoro-n-octanoic Acid	PFOA	T		13C8-PFOA	No	No
4	Perfluorononanoic Acid	PFNA	T		13C9-PFNA	No	No
5	Perfluoro-n-decanoic Acid	PFDA	T		13C6-PFDA	No	No
6	Perfluoro-n-undecanoic acid	PFUnA	T		13C7-PFUnA	No	No
7	Perfluoro-n-dodecanoic acid	PFDoA	T		13C2-PFDoA	No	No
8	Perfluoro-n-tridecanoic acid	PFTrDA	T		13C2-PFTeDA	No	No
9	Perfluoro-n-tetradecanoic acid	PFTeDA	T		13C2-PFTeDA	No	No
10	N-methylperfluoro-1-octanesulfonamidoacetic acid	NMeFOSAA	T		d3-MeFOSAA	No	No
11	N-ethylperfluoro-octanesulfonamidoacetic acid	NEtFOSAA	T		d5-EtFOSAA	No	No
12	Perfluoro-1-butanesulfonate	PFBS	T		13C3-PFBS	No	No
13	Perfluoro-1-hexanesulfonate	PFHxS	T		13C3-PFHxS	No	No
14	Perfluoro-1-octanesulfonate	PFOS	T		13C8-PFOS	No	No
15	Hexafluoropropylene oxide dimer acid	HFPO-DA	T		13C3-HFPO-DA	No	No
16	Adona	Adona	T		13C8-PFOA	No	No
17	9-chlorohexadecafluoro-3-oxanonane-1-sulfonic acid	9Cl-PF3ONS	T		13C8-PFOA	No	No

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WORK/QUALITY ASSURANCE PROJECT PLAN

Attachment 2: Test Codes

Project Test Code Name: Master_369D

No:	Analyte:	Report Name:	Type	RIS	SIS	Hidden:	Graph:
18	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	11Cl-PF3OUdS	T		13C8-PFOA	No	No
1	13C5-PFHxA	13C5-PFHxA	SIS	13C2-PFOA		No	No
2	13C4-PFHpA	13C4-PFHpA	SIS	13C2-PFOA		No	No
3	13C8-PFOA	13C8-PFOA	SIS	13C2-PFOA		No	No
4	13C9-PFNA	13C9-PFNA	SIS	13C2-PFOA		No	No
5	13C6-PFDA	13C6-PFDA	SIS	13C2-PFDA		No	No
6	13C7-PFUnA	13C7-PFUnA	SIS	13C2-PFDA		No	No
7	13C2-PFDoA	13C2-PFDoA	SIS	13C2-PFDA		No	No
8	13C2-PFTeDA	13C2-PFTeDA	SIS	13C2-PFDA		No	No
9	d3-MeFOSAA	d3-MeFOSAA	SIS	13C4-PFOS		No	No
10	d5-EtFOSAA	d5-EtFOSAA	SIS	13C4-PFOS		No	No
11	13C3-PFBS	13C3-PFBS	SIS	13C4-PFOS		No	No
12	13C3-PFHxS	13C3-PFHxS	SIS	13C4-PFOS		No	No
13	13C8-PFOS	13C8-PFOS	SIS	13C4-PFOS		No	No
14	13C3-HFPO-DA	13C3-HFPO-DA	SIS	13C2-PFOA		No	No

Total Analytes: 32

Subtract Peaks:

None

Sum Peaks:

None

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WORK/QUALITY ASSURANCE PROJECT PLAN

Attachment 2: Test Codes

Project Test Code Name: Master_369D

ICAL Acceptance Criteria:

Curve Fit:	Limit Mean(%):	Mean Qual:	Limit Ind.:	Ind. Qual:	Min Points:	Points Qual:	Comments:
Linear	NA	NA	0.99	N	5	N	y = Bx + C
Quadratic	NA	NA	0.99	N	6	N	y = Ax^2 + Bx + C

Continuing Calibration Verification Criteria:

CCV Name: 5-369

Frequency Hrs:	Mean PD(%):	Individual PD(%):	RIS/SIS RT Window (min):	Area Limit Low(%):	Area Limit High(%):	Comment:
12 (N)	30 (N)	30 (N)	0.04 (N)	-50	100 (N)	NA

Independent Calibration Verification:

ICC Name: 5-369

Mean PD Limit(%):	Ind. PD Limit(%):	RIS/SIS Window Limit (Secs):	Area Limit High(%):	Area Limit Low(%):	Comment:
30 (N)	30 (N)	0.04 (N)	-50	100 (N)	NA

Mass Discrimination Criteria:

None

Degredation Check Criteria:

None

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WORK/QUALITY ASSURANCE PROJECT PLAN

Attachment 3: Method Quality Objectives

MQO Application:	***Universal_LC***		
MQO:	**Acceptance Criteria:**	**Qual:**	**Corrective Action:**
Procedural Blank	Samples must be greater than five times the blank concentration (>5xPB).	B	Review with Project Manager; re-analyze or justify results in project records.
PB Measurement Quality Objective	Organic results in the Procedural Blank are less than 1/2 times the LOQ (<1/2xLOQ)	N	Review with Project Manager; re-analyze or justify results in project records.
Laboratory Control Sample	Recovery values 70-130%.	N	Review with project manager; re-analyze or justify reporting the results in project records.
Matrix Spike / Matrix Spike Duplicate Recovery	Organics 70-130%. Analyte concentration in MS/MSD must be greater than five times reported background concentration.	N	Review with Project Manager; re-analyze or justify reporting results in the project records.
	Organics Results in the Target is less than 5 times the Original	n	
Matrix Spike/Spike Duplicate Precision	Organics results less than 30% Relative Percent Difference (RPD). Analyte concentration in MS/MSD must be greater than five times reported background concentration.	N	Review with Project Manager; re-analyze or justify reporting results in the project records.
	Organics Results in the Target is less than 5 times the Original	n	
Standard Reference Material Accuracy	Organics Percent Difference less than 30% from a range of certified values on average. Analyte concentration must be greater than five times the Method Detection Limit (>5xMDL).	N	Review with Project Manager; re-analyze or justify reporting results in the project records.
	Organics Results in the Target is less than 5 times the MDL	n	
Analytical Duplicate Precision	Organics results less than 30% Relative Percent Difference (RPD). Analyte concentration must be > 5x MDL.	N	Review with Project Manager; re-analyze or justify reporting results in the project records.
	Organics Results in the Original is less than 5 times the MDL	n	

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WORK/QUALITY ASSURANCE PROJECT PLAN

Attachment 3: Method Quality Objectives

MQO Application:	***Universal_LC***		
MQO:	**Acceptance Criteria:**	**Qual:**	**Corrective Action:**
Analytical Triplicate Precision	Organics results less than 30% Relative Standard Deviation (RSD). Analyte concentration must be > 5x MDL.	N	Review with Project Manager; re-analyze or justify reporting results in the project records.
	Organics Results in the Original is less than 5 times the MDL	n	
Surrogate Compound Recovery	Recovery results between 50% and 150%.	N	Review with Project Manager; re-analyze or justify reporting results in the project records.
Control Oil	RPD < 30% for at least 90% of analytes	N	Results examined by project manager, task leader, or subcontractor lab manager. Reextraction, reanalysis, or justification documented.
Instrument Calibration	5-369-9: R-squared greater than or equal to 0.990		Results examined by project manager, task leader, or subcontractor lab manager. Reextraction, reanalysis, or justification documented.
Independent Calibration Check Solution	5-369-9: Individual PD less than or equal to 30%. Mean Percent Difference less than or equal to 30%.	N	Review with Project Manager; re-analyze or justify in project records.
Continuing Calibration Verification	5-369-9: Individual PD less than or equal to 30%. Mean Percent Difference less than or equal to 30%.	N	Review with Project Manager; re-analyze or justify in project records.

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ShpNo SHP-230817-04

Battelle Project No:026.000001

Sample Receipt Form

Approved: ☐ Authorized ☐

Project Number: 704758CH **Client:** Jacobs

Received by: Schumitz, Matt **Date/Time Received:** Thursday, August 17, 2023 10:00 AM

No. of Shipping Containers: 3

SHIPMENT

Method of Delivery: Commercial Carrier **Tracking Number:** Fed Ex

COC Forms: ☑ Shipped with samples ☐ No Forms

Cooler(s)/Box(es)

Cntr	Type	Tracking No.	Seal	Seal	Container	Therm.	Temp C	Smps
1 of 3	Cooler	7825 9871 9195	Custody Seals	Intact	Intact	Therm_4	1.9	9
2 of 3	Cooler	7825 9871 9200	Custody Seals	Intact	Intact	Therm_4	1.7	12
3 of 3	Cooler	7825 8836 7937	Custody Seals	Intact	Intact	Therm_4	2.3	4

Samples

Sample Labels:
☑ Sample labels agree with COC forms
☐ Discrepancies (see Sample Custody Corrective Action Form)

Container Seals:
☐ Tape ☐ Custody Seals ☐ Other Seals (See sample Log)
☑ Seals intact for each shipping container
☐ Seals broken (See sample log for impacted samples)

Condition of Samples:
☑ Sample containers intact
☐ Sample containers broken/leaking (See Custody Corrective Action Form)

Temperature upon receipt (°C): 2.3 Temperature Blank used ☑ Yes ☐ No
(Note: If temperature upon receipt differs from required conditions, see sample log comment field)

Samples Acidified: ☐ Yes ☐ No ☑ Unknown

Initial pH 5-9?: ☐ Yes ☐ No ☑ NA
If no, individual sample adjustments on the Auxiliary Sample Receipt Form

Total Residual Chlorine Present?: ☐ Yes ☐ No ☑ NA
If yes, individual sample adjustments on the Auxiliary Sample Receipt Form

Head Space <1% in samples for water VOC analysis: ☐ Yes ☐ No ☑ NA
Individual sample deviations noted on sample log

Samples Containers:
Samples returned in PC-grade jars: ☐ Yes ☐ No ☑ Unknown /Lot No.: Unknown

Storage Location: Custody: Refrigerator - R0119 (NA) **BDO IDs Assigned:** D7881 - D7905

Samples logged in by: Schumitz, Matt **Date/Time:** 08/17/2023 10:00 AM

Approved By: **Approved On:**

Authorized By: **Authorized On:**

BATTELLE
It can be done

ShpNo SHP-230817-04

Battelle Project No: 026.000001

Sample Receipt Form Details

Approved: ☐ **Authorized** ☐

Project Number: 704758CH **Client:** Jacobs

Received by: Schumitz, Matt **Date/Time Received:** Thursday, August 17, 2023 10:00 AM

No. of Shipping Containers: 3

BDO Id:	Client Sample ID:	Collection Date:	Login Date:	Ctrs:	Matrix:	Temp:	pH:	TRC:	VOC:	Stored In:	Loc:	No:	Comments:
D7881	NBKK-B76-FB01-081123	08/11/23 13:51	08/17/23 12:07	2	WATER	1.7	NA	NA	NA	R0119 (NA)	BIN	482	
D7882	NBKK-B76-EB01-081123	08/11/23 13:25	08/17/23 12:07	2	WATER	1.7	NA	NA	NA	R0119 (NA)	BIN	482	
D7883	NBKK-B76-SS07-0001	08/10/23 17:05	08/17/23 12:07	1	SOIL	1.9	NA	NA	NA	R0119 (NA)	BIN	483	
D7884	NBKK-B76-SS07-0001-MS	08/10/23 17:05	08/17/23 12:11	1	SOIL	1.9	NA	NA	NA	R0119 (NA)	BIN	483	
D7885	NBKK-B76-SS07-0001-MSD	08/10/23 17:05	08/17/23 12:11	1	SOIL	1.9	NA	NA	NA	R0119 (NA)	BIN	483	
D7886	NBKK-B76-SB07-2223	08/10/23 17:20	08/17/23 12:11	1	SOIL	1.9	NA	NA	NA	R0119 (NA)	BIN	483	
D7887	NBKK-B76-SB07-1516	08/10/23 17:15	08/17/23 12:11	1	SOIL	1.9	NA	NA	NA	R0119 (NA)	BIN	483	
D7888	NBKK-B76-EB01-081023	08/10/23 17:30	08/17/23 12:12	2	W	1.7	NA	NA	NA	R0119 (NA)	BIN	482	
D7889	NBKK-B76-SB08-2425	08/10/23 11:20	08/17/23 12:13	1	SOIL	1.9	NA	NA	NA	R0119 (NA)	BIN	483	
D7890	NBKK-B76-SB09-1920	08/09/23 11:50	08/17/23 12:13	1	SOIL	1.9	NA	NA	NA	R0119 (NA)	BIN	483	
D7891	NBKK-B76-SB06-2325	08/11/23 10:09	08/17/23 12:14	1	SOIL	1.9	NA	NA	NA	R0119 (NA)	BIN	483	
D7892	NBKK-B76-SB06-0910	08/11/23 10:04	08/17/23 12:14	1	SOIL	1.9	NA	NA	NA	R0119 (NA)	BIN	483	
D7893	NBKK-B76-MW06-0823	08/14/23 15:17	08/17/23 12:14	2	WATER	1.7	NA	NA	NA	R0119 (NA)	BIN	482	
D7894	NBKK-B76-MW06P-0823	08/14/23 15:12	08/17/23 12:15	2	WATER	1.7	NA	NA	NA	R0119 (NA)	BIN	482	
D7895	NBKK-B76-FB01-081423	08/14/23 16:21	08/17/23 12:15	2	WATER	1.7	NA	NA	NA	R0119 (NA)	BIN	482	
D7896	NBKK-B76-MW08-0823	08/15/23 9:49	08/17/23 12:16	2	WATER	1.7	NA	NA	NA	R0119 (NA)	BIN	482	
D7897	NBKK-B76-MW07-0823	08/15/23 13:51	08/17/23 12:16	2	WATER	1.7	NA	NA	NA	R0119 (NA)	BIN	482	
D7898	NBKK-B76-EB01-081523	08/15/23 13:56	08/17/23 12:17	2	WATER	1.7	NA	NA	NA	R0119 (NA)	BIN	482	
D7899	NBKK-B76-MW09-0823	08/14/23 16:13	08/17/23 12:17	2	WATER	1.7	NA	NA	NA	R0119 (NA)	BIN	482	
D7900	NBKK-B76-MW09-0823-MS	08/14/23 16:13	08/17/23 12:17	2	WATER	1.7	NA	NA	NA	R0119 (NA)	BIN	482	
D7901	NBKK-B76-MW09-0823-MSD	08/14/23 16:13	08/17/23 12:18	2	WATER	1.7	NA	NA	NA	R0119 (NA)	BIN	482	
D7902	NBKK-B76-IDW01-AQ-081623	08/16/23 11:20	08/17/23 12:18	2	W	2.3	NA	NA	NA	R0119 (NA)	BIN	482	
D7903	NBKK-B76-IDW02-AQ-081623	08/16/23 11:57	08/17/23 12:18	2	W	2.3	NA	NA	NA	R0119 (NA)	BIN	482	
D7904	NBKK-B76-IDW01-SO-081523	08/15/23 11:42	08/17/23 12:19	1	SO	2.3	NA	NA	NA	R0119 (NA)	BIN	483	
D7905	NBKK-B76-IDW02-SO-081623	08/16/23 11:02	08/17/23 12:19	1	SO	2.3	NA	NA	NA	R0119 (NA)	BIN	483	

Total Samples: 25

BATTELLE Chain of Custody

PAGE 1 OF 2

Project Name: KEYPORT BLD676	Client Project Manager: DENNIS BALLAM	Client Project Number: 704758CH
Deliver Results to: JUAN ACARON	Samples Collected by: LYNDSEY KLEPPIN	
Address: 3011 SW WILLSTON ROAD GAINSVILLE, FL 32608-3164	Phone: 907 227 0525	
	Email: LYNDSEY_KLEPPIN@JACOBS.COM	
Phone: 352-384-7002	Time Zone: AK	1480035 19
Email: JUAN.ACARON@JACOBS.COM	PO reference:	

Test / Preservative [1]: PFAS

COC Number: BB1523-01

Turnaround Time [2]:
- ☐ 28-days (standard)
- ☐ 21-days (Rush)
- ☐ 14-days (Rush)
- ☒ 7-days (Rush)
- ☐ 3-day (Rush)

	Sample ID	Date	Time	Type [3]	Matrix	Count	Lab ID	PFAS	Sample Comments
✓	NBKK-B76-FB01-BB1123	8/11/23	1351		WATER	2	D7881	X	
✓	NBKK-B76-EB01-BB1123	8/11/23	1325		WATER	2	82	X	
✓	NBKK-B76-SS07-0001	8/10/23	1705		SOIL	1	83	X	
✓	NBKK-B76-SS07-0001-MS	8/10/23	1705		SOIL	1	84	X	
✓	NBKK-B76-SS07-0001-MSD	8/10/23	1705		SOIL	1	85	X	
✓	NBKK-B76-SB07-2223	8/10/23	1720		SOIL	1	86	X	HOLD
✓	NBKK-B76-SB07-1516	8/10/23	1715		SOIL	1	87	X	
✓	NBKK-B76-EB01-081023	8/10/23	1730		~~SOIL~~ W	2	88	X	
✓	NBKK-B76-SB08-2425	8/10/23	1120		SOIL	1	89	X	
✓	NBKK-B76-SB09-1920	8/09/23	1150		SOIL	1	90	X	
✓	NBKK-B76-SB06-2325	8/11/23	1009		SOIL	1	91	X	HOLD
✓	NBKK-B76-SB06-0910	8/11/23	1004		SOIL	1	92	X	
✓	NBKK-B76-MW06-0823	8/14/23	1517		WATER	2	93	X	
✓	NBKK-B76-MW06P-0823	8/14/23	1512		WATER	2	94	X	
✓	NBKK-B76-FB01-081423	8/14/23	1821		WATER	2	D7895	X	

Relinquished by (Print/Sign): LYNDSEY KLEPPIN	Company: JACOBS	Date/Time: 8/15/23 1600	Received by (Print/Sign):	Company: BWO	Date/Time: 8/17/23 1000
Relinquished by (Print/Sign):	Company:	Date/Time:	Received by (Print/Sign):	Company:	Date/Time:
Relinquished by (Print/Sign):	Company:	Date/Time:	Received by (Print/Sign):	Company:	Date/Time:

Field Project comments: SOIL SAMPLES IN COOLER #01
WATER SAMPLES IN COOLER #02

Receipt comments:

[1] include comments in the Field Project comment field if there are method specific requirements, i.e., "WHO PCB Congener list", "PFAS – 18 analytes", or "PFAS – 29 analytes from UCMR5"

[2] Rush TAT request should be verified with the lab prior to submitting samples

[3] Client sample type, if applicable

BATTELLE Chain of Custody

Project Name: KEYPORT BLDG 76	**Client Project Manager:** DENNIS BALLAM	**Client Project Number:** 704758CH	**COC Number:** 0B1523-02
Deliver Results to: JAN ACARON	**Samples Collected by:** LYNDSEY KLEPPIN		**Turnaround Time[2]:** ☐ 28-days (standard) ☐ 21-days (Rush) ☐ 14-days (Rush) ☐ 7-days (Rush) ☐ 3-day (Rush)
Address:	**Phone:** 907 227 0535		
	Email: LYNDSEY.KLEPPIN@JACOBS.COM		
Phone:	**Time Zone:** AK		
Email:	**PO reference:** 1480003519		

	Sample ID	Date	Time	Type[3]	Matrix	Count	Lab ID	Test / Preservative[1]: PFAS	Sample Comments
✓	NBKK-B76-MW08-0823	8/15/23	0949		WATER	2	D7896	X	
✓	NBKK-B76-MW07-0823	8/15/23	1351		WATER	2	97	X	
✓	NBKK-B76-EB01-0B1523	8/15/23	1356		WATER	2	98	X	
✓	NBKK-B76-MW09-0823	8/14/23	1613		WATER	2	99	X	
✓	NBKK-B76-MW09-0823-MS	8/14/23	1613		WATER	2	D7900	X	
✓	NBKK-B76-MW09-0823-MSD	8/14/23	1613		WATER	2	D7901	X	

Relinquished by (Print/Sign): LYNDSEY KLEPPIN	Company: JACOBS	Date/Time: 8/15/23 1600	Received by (Print/Sign):	Company: BNO	Date/Time: 8/17/23 1000
Relinquished by (Print/Sign):	Company:	Date/Time:	Received by (Print/Sign):	Company:	Date/Time:
Relinquished by (Print/Sign):	Company:	Date/Time:	Received by (Print/Sign):	Company:	Date/Time:

Field Project comments:
SOIL SAMPLES IN COOLER # 01
WATER SAMPLES IN COOLER #02

Receipt comments:

---

[1] include comments in the Field Project comment field if there are method specific requirements, i.e., "WHO PCB Congener list", "PFAS – 18 analytes", or "PFAS – 29 analytes from UCMR5"

[2] Rush TAT request should be verified with the lab prior to submitting samples

[3] Client sample type, if applicable

BATTELLE

Chain of Custody

Project Name: KEYPORT BLDG 76	**Client Project Manager:** DENNIS BALLAM	**Client Project Number:** 704758CH	**COC Number:** 08623
Deliver Results to: JUAN ALARON	**Samples Collected by:** LYNDSEY KLEPPIN		**Turnaround Time[2]:** ☐ 28-days (standard) ☐ 21-days (Rush) ☐ 14-days (Rush) ☒ 7-days (Rush) ☐ 3-day (Rush)
Address: 3011 SW WILLISTON RD GAINSVILLE FL 32608-3967	**Phone:** 907 227 0525		
Phone: 352-384-7002	**Email:** LYNDSEY.KLEPPINC@JACOBS.COM		
Email: JAN.ALARON@JACOBS.COM	**Time Zone:** AK		
	PO reference: 4800351 9		

Sample ID	Date	Time	Type[3]	Matrix	Count	Lab ID	Test / Preservative[1]: PFAS	Sample Comments
NBKK-B76-1DW01-AQ-DB1623	8/16/23	1120		W	2	D7902	X	
NBKK-B76-1DW02-AQ-DB1623	8/16/23	1157		W	2	D7903	X	
NBKK-B76-1DW01-SO-DB1523	8/15/23	1142		SO	1	D7904	X	
NBKK-B76-1DW02-SO-DB1623	8/16/23	1102		SO	1	D7905	X	

Relinquished by (Print/Sign): LYNDSEY KLEPPIN	Company: JACOBS	Date/Time: 8/16/23 1400	Received by (Print/Sign):	Company: BNO	Date/Time: 8/17/23 1000
Relinquished by (Print/Sign):	Company:	Date/Time:	Received by (Print/Sign):	Company:	Date/Time:
Relinquished by (Print/Sign):	Company:	Date/Time:	Received by (Print/Sign):	Company:	Date/Time:
Field Project comments:			Receipt comments:		

[1] include comments in the Field Project comment field if there are method specific requirements, i.e., "WHO PCB Congener list", "PFAS – 18 analytes", or "PFAS – 29 analytes from UCMR5"

[2] Rush TAT request should be verified with the lab prior to submitting samples

[3] Client sample type, if applicable

not lift using this tag.

GIN ID:PWTA (714) 548-5904
OBS
1 CLEVELAND ST STE 200
RGINIA BEACH, VA 23462
ITED STATES US

SHIP DATE: 15AUG23
ACTWGT: 53.70 LB
CAD: 6992270/SSF02422
DIMS: 25x13x14 IN

BILL THIRD PARTY

JONATHAN THORN
BATTELLE ANALYTICAL SERVICES
141 LONGWATER DR SUITE 202
704750CH CTO-4117
NORWELL MA 02061

81) 681-5565 REF:
DEPT:

FedEx
Expres

1 of 2
RK# 7825 3871 9195
201
MASTER

WED - 16 AUG 10:30
PRIORITY OVERNIGH
AH
0206
MA-US BOS

XE XPUA

Thurmy
1.9

Do not lift using this tag.

ORIGIN ID:PWTA (714) 548-5904
JACOBS
5701 CLEVELAND ST STE 200
VIRGINIA BEACH, VA 23462
UNITED STATES US

SHIP DATE: 15AUG23
ACTWGT: 50.80 LB
CAD: 6992270/SSF02422
DIMS: 25x13x14 IN

BILL THIRD PARTY

Part # 156297-435 RRD12 EXP 09/23

TO JONATHAN THORN
BATTELLE ANALYTICAL SERVICES
141 LONGWATER DR SUITE 202
704750CH CTO-4117
NORWELL MA 02061

(781) 681-5565 REF:
INV:
PO:
DEPT:

FedEx
Express

2 of 2
MPS# 7825 3871 9200
0263
Mstr# 7825 3871 9195

0201

WED - 16 AUG 10:30A
PRIORITY OVERNIGHT
AHS
02061
MA-US BOS

XE XPUA

Thurmy
1.7

247 1 B 10.30 9200 08 16

ORIGIN ID:PWTA (000) 000-0000

JACOBS
5701 CLEVELAND ST STE 200

VIRGINIA BEACH, VA 23462
UNITED STATES US

SHIP DATE: 16AUG23
ACTWGT: 31.55 LB
CAD: 8992270/SSF02422
DIMS: 18x15x13 IN

BILL THIRD PARTY

Part # 156297-435 RRD82 EXP 09/23

TO BATELL
ATTN: JONOTHAN THORN
141 LONGWATER DRIVE STE 202

NORWELL MA 02061

(781) 681-5666 REF:
INV:
PO: 704758CH DEPT:

FedEx Express

J2311230725011ev

TRK# 0201 7825 8836 7937

THU - 17 AUG 10:30A
PRIORITY OVERNIGHT

AHS
02061
MA-US BOS

XE XPUA

Data Tables

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-IDW01-AQ-081623
Battelle ID	D7902-FS
Sample Type	SA
Collection Date	08/16/2023
Extraction Date	08/18/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	NA
Matrix	W
Sample Size	0.281
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	32.3	D7902-FS(0)	1.000	8/21/2023	0.812	2.22	4.45
PFHpA	375-85-9	20.2	D7902-FS(0)	1.000	8/21/2023	0.837	2.22	4.45
PFOA	335-67-1	26.1	D7902-FS(0)	1.000	8/21/2023	0.899	2.22	4.45
PFNA	375-95-1	2.22 U	D7902-FS(0)	1.000	8/21/2023	0.741	2.22	4.45
PFDA	335-76-2	2.22 U	D7902-FS(0)	1.000	8/21/2023	0.698	2.22	4.45
PFUnA	2058-94-8	2.22 U	D7902-FS(0)	1.000	8/21/2023	0.669	2.22	4.45
PFDoA	307-55-1	2.22 U	D7902-FS(0)	1.000	8/21/2023	0.676	2.22	4.45
PFTrDA	72629-94-8	2.22 U	D7902-FS(0)	1.000	8/21/2023	0.660	2.22	4.45
PFTeDA	376-06-7	2.22 U	D7902-FS(0)	1.000	8/21/2023	0.704	2.22	4.45
NMeFOSAA	2355-31-9	2.22 U	D7902-FS(0)	1.000	8/21/2023	0.916	2.22	4.45
NEtFOSAA	2991-50-6	2.22 U	D7902-FS(0)	1.000	8/21/2023	0.881	2.22	4.45
PFBS	375-73-5	2.22 U	D7902-FS(0)	1.000	8/21/2023	0.770	2.22	4.45
PFHxS	355-46-4	20.8	D7902-FS(0)	1.000	8/21/2023	0.887	2.22	4.45
PFOS	1763-23-1	85.6 Q	D7902-FS(0)	1.000	8/21/2023	0.952	2.22	4.45
HFPO-DA	13252-13-6	2.22 U	D7902-FS(0)	1.000	8/21/2023	0.770	2.22	4.45
Adona	919005-14-4	2.22 U	D7902-FS(0)	1.000	8/21/2023	0.773	2.22	4.45
9Cl-PF3ONS	756426-58-1	2.22 U	D7902-FS(0)	1.000	8/21/2023	0.916	2.22	4.45
11Cl-PF3OUdS	763051-92-9	2.22 U	D7902-FS(0)	1.000	8/21/2023	0.802	2.22	4.45

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-IDW01-AQ-081623
Battelle ID	D7902-FS
Sample Type	SA
Collection Date	08/16/2023
Extraction Date	08/18/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS

Surrogate Recoveries (%)	Recovery		Extract ID	Analysis Date
13C5-PFHxA	17	N	D7902-FS(0)	8/21/2023
13C4-PFHpA	21	N	D7902-FS(0)	8/21/2023
13C8-PFOA	17	N	D7902-FS(0)	8/21/2023
13C9-PFNA	6	N	D7902-FS(0)	8/21/2023
13C6-PFDA	17	N	D7902-FS(0)	8/21/2023
13C7-PFUnA	31	N	D7902-FS(0)	8/21/2023
13C2-PFDoA	52		D7902-FS(0)	8/21/2023
13C2-PFTeDA	108		D7902-FS(0)	8/21/2023
d3-MeFOSAA	3	N	D7902-FS(0)	8/21/2023
d5-EtFOSAA	2	N	D7902-FS(0)	8/21/2023
13C3-PFBS	93		D7902-FS(0)	8/21/2023
13C3-PFHxS	100		D7902-FS(0)	8/21/2023
13C8-PFOS	20	N	D7902-FS(0)	8/21/2023
13C3-HFPO-DA	13	N	D7902-FS(0)	8/21/2023

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-IDW02-AQ-081623
Battelle ID	D7903-FS
Sample Type	SA
Collection Date	08/16/2023
Extraction Date	08/18/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	NA
Matrix	W
Sample Size	0.281
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	10.3	D7903-FS(0)	1.000	8/21/2023	0.812	2.22	4.45
PFHpA	375-85-9	5.47	D7903-FS(0)	1.000	8/21/2023	0.837	2.22	4.45
PFOA	335-67-1	10.8	D7903-FS(0)	1.000	8/21/2023	0.899	2.22	4.45
PFNA	375-95-1	2.02 J	D7903-FS(0)	1.000	8/21/2023	0.741	2.22	4.45
PFDA	335-76-2	2.22 U	D7903-FS(0)	1.000	8/21/2023	0.698	2.22	4.45
PFUnA	2058-94-8	2.22 U	D7903-FS(0)	1.000	8/21/2023	0.669	2.22	4.45
PFDoA	307-55-1	2.22 U	D7903-FS(0)	1.000	8/21/2023	0.676	2.22	4.45
PFTrDA	72629-94-8	2.22 U	D7903-FS(0)	1.000	8/21/2023	0.660	2.22	4.45
PFTeDA	376-06-7	2.22 U	D7903-FS(0)	1.000	8/21/2023	0.704	2.22	4.45
NMeFOSAA	2355-31-9	2.22 U	D7903-FS(0)	1.000	8/21/2023	0.916	2.22	4.45
NEtFOSAA	2991-50-6	2.22 U	D7903-FS(0)	1.000	8/21/2023	0.881	2.22	4.45
PFBS	375-73-5	0.890 J	D7903-FS(0)	1.000	8/21/2023	0.770	2.22	4.45
PFHxS	355-46-4	7.37	D7903-FS(0)	1.000	8/21/2023	0.887	2.22	4.45
PFOS	1763-23-1	15.8	D7903-FS(0)	1.000	8/21/2023	0.952	2.22	4.45
HFPO-DA	13252-13-6	2.22 U	D7903-FS(0)	1.000	8/21/2023	0.770	2.22	4.45
Adona	919005-14-4	2.22 U	D7903-FS(0)	1.000	8/21/2023	0.773	2.22	4.45
9Cl-PF3ONS	756426-58-1	2.22 U	D7903-FS(0)	1.000	8/21/2023	0.916	2.22	4.45
11Cl-PF3OUdS	763051-92-9	2.22 U	D7903-FS(0)	1.000	8/21/2023	0.802	2.22	4.45

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	NBKK-B76-IDW02-AQ-081623
Battelle ID	D7903-FS
Sample Type	SA
Collection Date	08/16/2023
Extraction Date	08/18/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS

Surrogate Recoveries (%)	Recovery		Extract ID	Analysis Date
13C5-PFHxA	177	N	D7903-FS(0)	8/21/2023
13C4-PFHpA	180	N	D7903-FS(0)	8/21/2023
13C8-PFOA	87		D7903-FS(0)	8/21/2023
13C9-PFNA	117		D7903-FS(0)	8/21/2023
13C6-PFDA	85		D7903-FS(0)	8/21/2023
13C7-PFUnA	82		D7903-FS(0)	8/21/2023
13C2-PFDoA	71		D7903-FS(0)	8/21/2023
13C2-PFTeDA	37	N	D7903-FS(0)	8/21/2023
d3-MeFOSAA	185	N	D7903-FS(0)	8/21/2023
d5-EtFOSAA	183	N	D7903-FS(0)	8/21/2023
13C3-PFBS	134		D7903-FS(0)	8/21/2023
13C3-PFHxS	86		D7903-FS(0)	8/21/2023
13C8-PFOS	113		D7903-FS(0)	8/21/2023
13C3-HFPO-DA	141		D7903-FS(0)	8/21/2023

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID		LZ91 IB			
Battelle ID		LZ91 IB_08/21/2023			
Sample Type		IB			
Collection Date		NA			
Extraction Date		NA			
Analysis Date		08/21/2023			
Analytical Instrument		Sciex 6500 (AD) LC/MS/MS			
% Moisture		NA			
Matrix		Water			
Sample Size		0.250			
Size Unit-Basis		L			
Analyte	CAS No.	Result (ng/L)	DL	LOD	LOQ
PFHxA	307-24-4	2.50 U	0.913	2.50	5.00
PFHpA	375-85-9	2.50 U	0.941	2.50	5.00
PFOA	335-67-1	2.50 U	1.01	2.50	5.00
PFNA	375-95-1	2.50 U	0.833	2.50	5.00
PFDA	335-76-2	2.50 U	0.784	2.50	5.00
PFUnA	2058-94-8	0.900 J	0.752	2.50	5.00
PFDoA	307-55-1	2.50 U	0.760	2.50	5.00
PFTrDA	72629-94-8	2.50 U	0.742	2.50	5.00
PFTeDA	376-06-7	2.50 U	0.791	2.50	5.00
NMeFOSAA	2355-31-9	2.50 U	1.03	2.50	5.00
NEtFOSAA	2991-50-6	2.50 U	0.990	2.50	5.00
PFBS	375-73-5	2.50 U	0.866	2.50	5.00
PFHxS	355-46-4	2.50 U	0.997	2.50	5.00
PFOS	1763-23-1	2.50 U	1.07	2.50	5.00
HFPO-DA	13252-13-6	2.50 U	0.865	2.50	5.00
Adona	919005-14-4	2.50 U	0.869	2.50	5.00
9Cl-PF3ONS	756426-58-1	2.50 U	1.03	2.50	5.00
11Cl-PF3OUdS	763051-92-9	2.50 U	0.901	2.50	5.00

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	LZ91 IB
Battelle ID	LZ91 IB_08/21/2023
Sample Type	IB
Collection Date	NA
Extraction Date	NA
Analysis Date	08/21/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	NA
Matrix	Water
Sample Size	0.250
Size Unit-Basis	L

Surrogate Recoveries (%)

13C5-PFHxA	109
13C4-PFHpA	108
13C8-PFOA	108
13C9-PFNA	108
13C6-PFDA	98
13C7-PFUnA	101
13C2-PFDoA	97
13C2-PFTeDA	95
d3-MeFOSAA	118
d5-EtFOSAA	110
13C3-PFBS	103
13C3-PFHxS	100
13C8-PFOS	98
13C3-HFPO-DA	103

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	Procedural Blank
Battelle ID	DO701PB-FS
Sample Type	PB
Collection Date	08/18/2023
Extraction Date	08/18/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	NA
Matrix	WATER
Sample Size	0.258
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	DL	LOD	LOQ
PFHxA	307-24-4	2.42 U	DO701PB-FS(0)	1.000	8/21/2023	0.885	2.42	4.84
PFHpA	375-85-9	2.42 U	DO701PB-FS(0)	1.000	8/21/2023	0.912	2.42	4.84
PFOA	335-67-1	2.42 U	DO701PB-FS(0)	1.000	8/21/2023	0.979	2.42	4.84
PFNA	375-95-1	2.42 U	DO701PB-FS(0)	1.000	8/21/2023	0.807	2.42	4.84
PFDA	335-76-2	2.42 U	DO701PB-FS(0)	1.000	8/21/2023	0.760	2.42	4.84
PFUnA	2058-94-8	2.42 U	DO701PB-FS(0)	1.000	8/21/2023	0.729	2.42	4.84
PFDoA	307-55-1	2.42 U	DO701PB-FS(0)	1.000	8/21/2023	0.736	2.42	4.84
PFTrDA	72629-94-8	2.42 U	DO701PB-FS(0)	1.000	8/21/2023	0.719	2.42	4.84
PFTeDA	376-06-7	2.42 U	DO701PB-FS(0)	1.000	8/21/2023	0.766	2.42	4.84
NMeFOSAA	2355-31-9	2.42 U	DO701PB-FS(0)	1.000	8/21/2023	0.998	2.42	4.84
NEtFOSAA	2991-50-6	2.42 U	DO701PB-FS(0)	1.000	8/21/2023	0.959	2.42	4.84
PFBS	375-73-5	2.42 U	DO701PB-FS(0)	1.000	8/21/2023	0.839	2.42	4.84
PFHxS	355-46-4	2.42 U	DO701PB-FS(0)	1.000	8/21/2023	0.966	2.42	4.84
PFOS	1763-23-1	2.42 U	DO701PB-FS(0)	1.000	8/21/2023	1.04	2.42	4.84
HFPO-DA	13252-13-6	2.42 U	DO701PB-FS(0)	1.000	8/21/2023	0.838	2.42	4.84
Adona	919005-14-4	2.42 U	DO701PB-FS(0)	1.000	8/21/2023	0.842	2.42	4.84
9Cl-PF3ONS	756426-58-1	2.42 U	DO701PB-FS(0)	1.000	8/21/2023	0.998	2.42	4.84
11Cl-PF3OUdS	763051-92-9	2.42 U	DO701PB-FS(0)	1.000	8/21/2023	0.873	2.42	4.84

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	Procedural Blank
Battelle ID	DO701PB-FS
Sample Type	PB
Collection Date	08/18/2023
Extraction Date	08/18/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS

Surrogate Recoveries (%)	**Recovery**	**Extract ID**	**Analysis Date**
13C5-PFHxA	98	DO701PB-FS(0)	8/21/2023
13C4-PFHpA	101	DO701PB-FS(0)	8/21/2023
13C8-PFOA	100	DO701PB-FS(0)	8/21/2023
13C9-PFNA	101	DO701PB-FS(0)	8/21/2023
13C6-PFDA	98	DO701PB-FS(0)	8/21/2023
13C7-PFUnA	100	DO701PB-FS(0)	8/21/2023
13C2-PFDoA	95	DO701PB-FS(0)	8/21/2023
13C2-PFTeDA	92	DO701PB-FS(0)	8/21/2023
d3-MeFOSAA	99	DO701PB-FS(0)	8/21/2023
d5-EtFOSAA	93	DO701PB-FS(0)	8/21/2023
13C3-PFBS	89	DO701PB-FS(0)	8/21/2023
13C3-PFHxS	84	DO701PB-FS(0)	8/21/2023
13C8-PFOS	80	DO701PB-FS(0)	8/21/2023
13C3-HFPO-DA	89	DO701PB-FS(0)	8/21/2023

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	Laboratory Control Sample
Battelle ID	DO702LCS-FS
Sample Type	LCS
Collection Date	08/18/2023
Extraction Date	08/18/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS
% Moisture	NA
Matrix	WATER
Sample Size	0.254
Size Unit-Basis	L

Analyte	CAS No.	Result (ng/L)	Extract ID	DF	Analysis Date	Target	Recovery	Qual	Control Limits Lower	Control Limits Upper
PFHxA	307-24-4	153	DO702LCS-FS(0)	1.000	8/21/2023	157	97		72	129
PFHpA	375-85-9	171	DO702LCS-FS(0)	1.000	8/21/2023	157	109		72	130
PFOA	335-67-1	197	DO702LCS-FS(0)	1.000	8/21/2023	157	125		71	133
PFNA	375-95-1	162	DO702LCS-FS(0)	1.000	8/21/2023	157	103		69	130
PFDA	335-76-2	156	DO702LCS-FS(0)	1.000	8/21/2023	157	99		71	129
PFUnA	2058-94-8	190	DO702LCS-FS(0)	1.000	8/21/2023	157	121		69	133
PFDoA	307-55-1	191	DO702LCS-FS(0)	1.000	8/21/2023	157	122		72	134
PFTrDA	72629-94-8	182	DO702LCS-FS(0)	1.000	8/21/2023	157	116		65	144
PFTeDA	376-06-7	153	DO702LCS-FS(0)	1.000	8/21/2023	157	97		71	132
NMeFOSAA	2355-31-9	189	DO702LCS-FS(0)	1.000	8/21/2023	157	120		65	136
NEtFOSAA	2991-50-6	196	DO702LCS-FS(0)	1.000	8/21/2023	157	125		61	135
PFBS	375-73-5	173	DO702LCS-FS(0)	1.000	8/21/2023	157	110		72	130
PFHxS	355-46-4	157	DO702LCS-FS(0)	1.000	8/21/2023	157	100		68	131
PFOS	1763-23-1	199	DO702LCS-FS(0)	1.000	8/21/2023	157	127		65	140
HFPO-DA	13252-13-6	156	DO702LCS-FS(0)	1.000	8/21/2023	157	99		60	126
Adona	919005-14-4	201	DO702LCS-FS(0)	1.000	8/21/2023	157	128		61	130
9Cl-PF3ONS	756426-58-1	168	DO702LCS-FS(0)	1.000	8/21/2023	157	107		60	126
11Cl-PF3OUdS	763051-92-9	185	DO702LCS-FS(0)	1.000	8/21/2023	157	118		56	125

BATTELLE
It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

Client ID	Laboratory Control Sample
Battelle ID	DO702LCS-FS
Sample Type	LCS
Collection Date	08/18/2023
Extraction Date	08/18/2023
Analytical Instrument	Sciex 6500 (AD) LC/MS/MS

Surrogate Recoveries (%)	Recovery	Extract ID	Analysis Date
13C5-PFHxA	94	DO702LCS-FS(0)	8/21/2023
13C4-PFHpA	92	DO702LCS-FS(0)	8/21/2023
13C8-PFOA	86	DO702LCS-FS(0)	8/21/2023
13C9-PFNA	93	DO702LCS-FS(0)	8/21/2023
13C6-PFDA	93	DO702LCS-FS(0)	8/21/2023
13C7-PFUnA	88	DO702LCS-FS(0)	8/21/2023
13C2-PFDoA	85	DO702LCS-FS(0)	8/21/2023
13C2-PFTeDA	89	DO702LCS-FS(0)	8/21/2023
d3-MeFOSAA	93	DO702LCS-FS(0)	8/21/2023
d5-EtFOSAA	86	DO702LCS-FS(0)	8/21/2023
13C3-PFBS	89	DO702LCS-FS(0)	8/21/2023
13C3-PFHxS	91	DO702LCS-FS(0)	8/21/2023
13C8-PFOS	81	DO702LCS-FS(0)	8/21/2023
13C3-HFPO-DA	86	DO702LCS-FS(0)	8/21/2023

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Glossary of Data Qualifiers

Flag:	Application:
B	Analyte found in the sample at a concentration <10x the level found in the procedural blank
D	Dilution Run. Initial run outside the initial calibration range of the instrument
E	Estimate, result is greater than the highest concentration level in the calibration
J	Analyte detected below the Limit of Quantitation (LOQ)
MI	Significant Matrix Interference - value could not be determined.
N	Quality Control (QC) value is outside the accuracy or precision Data Quality Objective (DQO)
NA	Not Applicable
T	Holding Time (HT) exceeded
U	Analyte not detected or detected below the Detection Limit (DL) value, Limit of Detection (LOD) reported
Q	Ion ratio outside of criteria (50% difference from calibration expected ratio)

Miscellaneous Documentation

QA/QC Summary
Batch 23-1034

Project:	CTO-4117: NBK Keyport
Client Project Manager:	Juan Acaron
Parameters:	PFAS
Laboratory:	Battelle, Norwell, MA
Matrix:	W
Data Set:	DP-23-1138
Analytical SOP:	5-369
Method Reference:	PFAS to QSM 5.3 Table B-15

Sample Custody		
Collection Date	Receipt Date	Temp (°C)
8/9 – 11, 14 – 16/2023	8/17/2023	1.9, 1.7, 2.3
Corrective Actions	None.	
Sample Storage	The samples were stored refrigerated until extraction.	
Related samples	None.	

	METHOD SUMMARIES
Sample Preparation	Water samples were fortified with surrogates in the original sample container from the field. The water was extracted using a Weak-anion exchange (WAX) solid phase extraction (SPE) cartridge. Target analytes are eluted from the WAX SPE using 1% NH_3OH in methanol. Extracts were acidified with acetic acid and further refined using dispersive Envi-carb to remove co-extracted interferences. Extracts were fortified with internal standards and transferred to LC-MS/MS for analysis.
Prep comments	pH of all samples prior to SPE extraction was verified between 6 and 8. Sample D7902-FS (NBKK-B76-IDW01-AQ-081623) contained particulates.
Analysis	PFAS were measured by liquid chromatography tandem mass spectrometry (LC-MS/MS) in the multiple reaction monitoring (MRM). An initial calibration consisting of representative target analytes, labelled analogs, and internal standards was analyzed prior to analysis to demonstrate the linear range of analysis. Calibration verification was performed at the beginning and end of 10 injections and at the end of each sequence. Target PFAS were quantified using the isotope dilution method. Samples are reported in ng/L concentrations to three (3) significant figures.
Analysis Comments	Samples analyzed on Sciex 6500 (AD) LC-MS/MS. MeFOSAA, EtFOSAA, PFHxS, and PFOS in the LCS, and field samples when detected, were found and reported as a combination of the branched and linear isomers. d3-MeFOSAA and d5-EtFOSAA are quantified using 13C2-PFOA. The following calibration points were not used in the primary or secondary transitions, when applicable, for the calibration: • PFNA in the L1

QA/QC Summary
Batch 23-1034

	These points were not used in this calibration as they were outside the linear range for the analyte in this analytical run. As these points are below the LOQ concentration equivalent, the reported concentrations are not above the high point of the calibrations, and these analytes use a minimum of five points for linear and six points for quadratic, there is no impact on the reported data excluding these points. Points in the middle of calibration points are not excluded from use. There were some analyte RT shifts in D7902-FS (NBKK-B76-IDW01-AQ-081623) that were confirmed and attributed to matrix effect. Secondary exceedances for calibrations, ICC, and CCV samples are not documented as the secondary transition is monitored solely for peak identification, not quantification. There is no impact on the reported data.

Holding Times	Extraction Date(s)	Analysis Date(s)
	8/18/2023	8/21 – 22/2023

Procedural Blank (PB)	A PB was prepared with this analytical batch to ensure the sample extraction and analysis methods are free of contamination.
≤ ½ the LOQ Samples >10x PB	No exceedances noted.
	No comments.

Laboratory Control Spike (LCS)	A LCS was prepared with this analytical batch. The percent recoveries of target analytes were calculated to measure accuracy.
Laboratory derived control limits for recovery	No exceedances noted.
	No comments.

Matrix Spike and Matrix Spike Duplicate (MS/MSD)	A MS/MSD was prepared with this analytical batch. The percent recoveries of target analytes were calculated to measure accuracy.
Laboratory derived control limits for recovery and <30% RPD	Project specific MS/MSD not included in this data set.
	No comments.

Extracted Internal Standard Analytes	Labelled analog compounds were added prior to extraction. The recoveries are calculated to measure extraction efficiency.
50-150% of true value	Fifteen (15) exceedances noted.
	Two samples had suppressed or enhanced recoveries for select extracted internal standards. The table below indicates if the extracted internal standard was within +/- 50% of the area of the L5 calibration point (“P”) or if the area showed suppression (“↓”) or enhancement (“↑”) for these extracted internal standards.

QA/QC Summary
Batch 23-1034

	13C5-PFHxA	13C4-PFHpA	13C8-PFOA	13C9-PFNA	13C6-PFDA	13C7-PFUnA	13C7-PFTeA	d3-MeFOSAA	d5-EtFOSAA	13C8-PFOS	13C3-HFPO-DA
D7902-FS (NBKK-B76-IDW01-AQ-081623)	←	←	←	←	←	←		←	←	←	←
D7903-FS (NBKK-B76-IDW02-AQ-081623)	P	P					←	P	P		

The remaining extracted internal standards in each impacted sample, fortified from the same solution, pass all criteria, suggesting that the suppression is matrix related to these analytes only. The sample extracts were re-analyzed for confirmation. The quant report for the confirmation analysis is included in the unused data section of the full data package.

Internal Standard Analytes	Labelled analog compounds were added prior to analysis.
+/- 50% of the area of the L5 calibration point.	Three (3) exceedances noted.
	One sample demonstrated suppression for 13C2-PFOA, 13C2-PFDA, and 13C4-PFOS.

Initial Calibration (ICAL)	The LC-MS/MS was calibrated with multi-level calibration curve for all compounds using linear or quadratic curve fitting.
+/- 30% of true value, $R^2 \geq 0.99$	No exceedances noted.
	No comments.

Independent Calibration Check (ICC)	The independent check was run after each initial calibration to verify the calibration. This standard is from a different source than the ICAL.
+/- 30% of true value	No exceedances noted.
	No comments.

Continuing Calibration Verification (CCV)	Continuing calibration standards were run at the beginning and end of 10 injections and at the end of the sequence to ensure that initial calibration is still valid.
+/- 30% of true value	No exceedances noted.
	No comments.

Instrument Blank (IB)	Immediately following the highest standard analyzed and daily prior to sample analysis.
≤ ½ the LOQ	No exceedances noted.
	No comments.

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Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project Number: G25161.X1.XX.0026.000001
Preparation Batch: 23-1034
Data Set: DP-23-1138
Test Code: Master_369D

QC Parameter:	Exceed:	Justification:
Procedural Blank	0	None
PB Measurement Quality Objective	0	None
Laboratory Control Sample	0	None
Matrix Spike / Matrix Spike Duplicate Recovery	NA	None
Matrix Spike / Matrix Spike Duplicate Precision	NA	None
Extracted Internal Standard Analytes (Surrogates)	15	Exceedances were confirmed by analyzing a fresh aliquot of sample. VU 23AUG2023
Instrument Calibration	0	None
Instrument Blank	0	None
Independent Calibration Check	0	None
Continuing Calibration Verification	0	None

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BATTELLE - NORWELL OPERATIONS
MISCELLANEOUS DOCUMENTATION FORM

Project Title:	CTO-4117: Northwest PFAS Investigatio	**Data Set Number:**	DP-23-1138
Project Number:	G25161.X1.XX.0026.000001	**Prep Batch Number:**	23-1034
Entered By:	Vincent Urso	**Entered On:**	08/23/2023
Test Code (Matrix Type):	Master_369D(L)		

Samples that were manually integrated are noted on the Manual Integration reports with the comment “Manual” under the Integration Type columns. Changes were made due to incorrect auto integration of a peak by the data system. The analyst’s initials on this statement indicate that all integrations were reviewed and approved by the analyst performing the analysis. VU 23AUG2023

The following calibration points were not used in the primary or secondary transitions, when applicable, for the calibration:
• PFNA in the L1.
These points were not used in this calibration as they were outside the linear range for the analyte in this analytical run. As these points are below the LOQ concentration equivalent, the reported concentrations are not above the high point of the calibrations, and these analytes use a minimum of five points for linear and six points for quadratic, there is no impact on the reported data excluding these points. Points in the middle of calibration points are not excluded from use. VU 23AUG2023

d3-MeFOSAA and d5-EtFOSAA are quantified using 13C2-PFOA.
VU 23AUG2023

Task Leader Approval:

SupervisorApproval:

PM Approval:

Digitally signed by Robert Lizotte, Jr.
Date: 2023.08.23 15:39:32 -04'00'

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Manual Integration Report

Created with Analyst Reporter
Printed: 23/08/2023 10:35:39 AM

Analyte: PFHxA_1 (313.0 / 269.0)

Data File	AD_08212023_5-369.wiff	**Result Table**	23-1034
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/21/2023 5:05:55 PM	Valley	13C5-PFHxA	Valley
LZ84	L2	8/21/2023 5:21:58 PM	Valley	13C5-PFHxA	Valley
LZ85	L3	8/21/2023 5:38:02 PM	Baseline	13C5-PFHxA	Valley
LZ86	L4	8/21/2023 5:54:06 PM	Baseline	13C5-PFHxA	Valley
LZ87	L5	8/21/2023 6:10:10 PM	Valley	13C5-PFHxA	Valley
LZ88	L6	8/21/2023 6:26:12 PM	Valley	13C5-PFHxA	Valley
LZ89	L7	8/21/2023 6:42:16 PM	Valley	13C5-PFHxA	Valley
LZ90	L8	8/21/2023 6:58:19 PM	Valley	13C5-PFHxA	Valley
LZ91 IB	Instrument Blank	8/21/2023 7:14:23 PM	N/A	13C5-PFHxA	Valley
LZ92 ICC	ICC	8/21/2023 7:30:28 PM	Baseline	13C5-PFHxA	Valley
LZ86 CCV	CCV	8/21/2023 10:27:16 PM	Valley	13C5-PFHxA	Valley
DO701PB-FS(0)	Procedural Blank	8/21/2023 10:43:21 PM	N/A	13C5-PFHxA	Valley
DO702LCS-FS(0)	Laboratory Control Sample	8/21/2023 10:59:25 PM	Valley	13C5-PFHxA	Baseline
D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/2023 11:15:29 PM	Baseline	13C5-PFHxA	Valley
D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/2023 11:31:33 PM	Valley	13C5-PFHxA	Valley
LZ87 CCV	CCV	8/22/2023 12:03:44 AM	Valley	13C5-PFHxA	Valley

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Manual Integration Report

Created with Analyst Reporter
Printed: 23/08/2023 10:35:39 AM

Analyte: PFHxA_2 (313.0 / 118.9)

Data File	AD_08212023_5-369.wiff	**Result Table**	23-1034
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/21/2023 5:05:55 PM	Valley	13C5-PFHxA	Valley
LZ84	L2	8/21/2023 5:21:58 PM	Baseline	13C5-PFHxA	Valley
LZ85	L3	8/21/2023 5:38:02 PM	Baseline	13C5-PFHxA	Valley
LZ86	L4	8/21/2023 5:54:06 PM	Valley	13C5-PFHxA	Valley
LZ87	L5	8/21/2023 6:10:10 PM	Valley	13C5-PFHxA	Valley
LZ88	L6	8/21/2023 6:26:12 PM	Baseline	13C5-PFHxA	Valley
LZ89	L7	8/21/2023 6:42:16 PM	Valley	13C5-PFHxA	Valley
LZ90	L8	8/21/2023 6:58:19 PM	Valley	13C5-PFHxA	Valley
LZ91 IB	Instrument Blank	8/21/2023 7:14:23 PM	N/A	13C5-PFHxA	Valley
LZ92 ICC	ICC	8/21/2023 7:30:28 PM	Valley	13C5-PFHxA	Valley
LZ86 CCV	CCV	8/21/2023 10:27:16 PM	Valley	13C5-PFHxA	Valley
DO701PB-FS(0)	Procedural Blank	8/21/2023 10:43:21 PM	N/A	13C5-PFHxA	Valley
DO702LCS-FS(0)	Laboratory Control Sample	8/21/2023 10:59:25 PM	Valley	13C5-PFHxA	Baseline
D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/2023 11:15:29 PM	Valley	13C5-PFHxA	Valley
D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/2023 11:31:33 PM	Baseline	13C5-PFHxA	Valley
LZ87 CCV	CCV	8/22/2023 12:03:44 AM	Valley	13C5-PFHxA	Valley

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Manual Integration Report

Created with Analyst Reporter
Printed: 23/08/2023 10:35:39 AM

Analyte: PFHpA_1 (363.1 / 319.0)

Data File	AD_08212023_5-369.wiff	**Result Table**	23-1034
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/21/2023 5:05:55 PM	Baseline	13C4-PFHpA	Valley
LZ84	L2	8/21/2023 5:21:58 PM	Valley	13C4-PFHpA	Valley
LZ85	L3	8/21/2023 5:38:02 PM	Valley	13C4-PFHpA	Valley
LZ86	L4	8/21/2023 5:54:06 PM	Valley	13C4-PFHpA	Valley
LZ87	L5	8/21/2023 6:10:10 PM	Baseline	13C4-PFHpA	Valley
LZ88	L6	8/21/2023 6:26:12 PM	Baseline	13C4-PFHpA	Valley
LZ89	L7	8/21/2023 6:42:16 PM	Valley	13C4-PFHpA	Valley
LZ90	L8	8/21/2023 6:58:19 PM	Valley	13C4-PFHpA	Valley
LZ91 IB	Instrument Blank	8/21/2023 7:14:23 PM	N/A	13C4-PFHpA	Baseline
LZ92 ICC	ICC	8/21/2023 7:30:28 PM	Baseline	13C4-PFHpA	Baseline
LZ86 CCV	CCV	8/21/2023 10:27:16 PM	Baseline	13C4-PFHpA	Baseline
DO701PB-FS(0)	Procedural Blank	8/21/2023 10:43:21 PM	Valley	13C4-PFHpA	Valley
DO702LCS-FS(0)	Laboratory Control Sample	8/21/2023 10:59:25 PM	Valley	13C4-PFHpA	Valley
D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/2023 11:15:29 PM	Valley	13C4-PFHpA	Baseline
D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/2023 11:31:33 PM	Valley	13C4-PFHpA	Valley
LZ87 CCV	CCV	8/22/2023 12:03:44 AM	Valley	13C4-PFHpA	Valley

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Manual Integration Report

Created with Analyst Reporter
Printed: 23/08/2023 10:35:39 AM

Analyte: PFHpA_2 (363.1 / 169.0)

Data File	AD_08212023_5-369.wiff	**Result Table**	23-1034
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/21/2023 5:05:55 PM	Valley	13C4-PFHpA	Valley
LZ84	L2	8/21/2023 5:21:58 PM	Valley	13C4-PFHpA	Valley
LZ85	L3	8/21/2023 5:38:02 PM	Baseline	13C4-PFHpA	Valley
LZ86	L4	8/21/2023 5:54:06 PM	Valley	13C4-PFHpA	Valley
LZ87	L5	8/21/2023 6:10:10 PM	Valley	13C4-PFHpA	Valley
LZ88	L6	8/21/2023 6:26:12 PM	Valley	13C4-PFHpA	Valley
LZ89	L7	8/21/2023 6:42:16 PM	Baseline	13C4-PFHpA	Valley
LZ90	L8	8/21/2023 6:58:19 PM	Valley	13C4-PFHpA	Valley
LZ91 IB	Instrument Blank	8/21/2023 7:14:23 PM	N/A	13C4-PFHpA	Baseline
LZ92 ICC	ICC	8/21/2023 7:30:28 PM	Valley	13C4-PFHpA	Baseline
LZ86 CCV	CCV	8/21/2023 10:27:16 PM	Valley	13C4-PFHpA	Baseline
DO701PB-FS(0)	Procedural Blank	8/21/2023 10:43:21 PM	N/A	13C4-PFHpA	Valley
DO702LCS-FS(0)	Laboratory Control Sample	8/21/2023 10:59:25 PM	Valley	13C4-PFHpA	Valley
D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/2023 11:15:29 PM	Valley	13C4-PFHpA	Baseline
D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/2023 11:31:33 PM	Valley	13C4-PFHpA	Valley
LZ87 CCV	CCV	8/22/2023 12:03:44 AM	Valley	13C4-PFHpA	Valley

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Manual Integration Report

Created with Analyst Reporter
Printed: 23/08/2023 10:35:39 AM

Analyte: PFOA_1 (413.0 / 369.0)

Data File	AD_08212023_5-369.wiff	**Result Table**	23-1034
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/21/2023 5:05:55 PM	Valley	13C8-PFOA	Valley
LZ84	L2	8/21/2023 5:21:58 PM	Valley	13C8-PFOA	Valley
LZ85	L3	8/21/2023 5:38:02 PM	Baseline	13C8-PFOA	Valley
LZ86	L4	8/21/2023 5:54:06 PM	Baseline	13C8-PFOA	Valley
LZ87	L5	8/21/2023 6:10:10 PM	Baseline	13C8-PFOA	Valley
LZ88	L6	8/21/2023 6:26:12 PM	Baseline	13C8-PFOA	Baseline
LZ89	L7	8/21/2023 6:42:16 PM	Baseline	13C8-PFOA	Valley
LZ90	L8	8/21/2023 6:58:19 PM	Valley	13C8-PFOA	Valley
LZ91 IB	Instrument Blank	8/21/2023 7:14:23 PM	Valley	13C8-PFOA	Baseline
LZ92 ICC	ICC	8/21/2023 7:30:28 PM	Valley	13C8-PFOA	Valley
LZ86 CCV	CCV	8/21/2023 10:27:16 PM	Baseline	13C8-PFOA	Baseline
DO701PB-FS(0)	Procedural Blank	8/21/2023 10:43:21 PM	Valley	13C8-PFOA	Valley
DO702LCS-FS(0)	Laboratory Control Sample	8/21/2023 10:59:25 PM	Valley	13C8-PFOA	Baseline
D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/2023 11:15:29 PM	Valley	13C8-PFOA	Valley
D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/2023 11:31:33 PM	Valley	13C8-PFOA	Valley
LZ87 CCV	CCV	8/22/2023 12:03:44 AM	Valley	13C8-PFOA	Valley

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Manual Integration Report

Created with Analyst Reporter
Printed: 23/08/2023 10:35:39 AM

Analyte: PFOA_2 (413.0 / 169.0)

Data File	AD_08212023_5-369.wiff	**Result Table**	23-1034
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/21/2023 5:05:55 PM	Baseline	13C8-PFOA	Valley
LZ84	L2	8/21/2023 5:21:58 PM	Valley	13C8-PFOA	Valley
LZ85	L3	8/21/2023 5:38:02 PM	Valley	13C8-PFOA	Valley
LZ86	L4	8/21/2023 5:54:06 PM	Valley	13C8-PFOA	Valley
LZ87	L5	8/21/2023 6:10:10 PM	Valley	13C8-PFOA	Valley
LZ88	L6	8/21/2023 6:26:12 PM	Valley	13C8-PFOA	Baseline
LZ89	L7	8/21/2023 6:42:16 PM	Baseline	13C8-PFOA	Valley
LZ90	L8	8/21/2023 6:58:19 PM	Valley	13C8-PFOA	Valley
LZ91 IB	Instrument Blank	8/21/2023 7:14:23 PM	Valley	13C8-PFOA	Baseline
LZ92 ICC	ICC	8/21/2023 7:30:28 PM	Valley	13C8-PFOA	Valley
LZ86 CCV	CCV	8/21/2023 10:27:16 PM	Baseline	13C8-PFOA	Baseline
DO701PB-FS(0)	Procedural Blank	8/21/2023 10:43:21 PM	N/A	13C8-PFOA	Valley
DO702LCS-FS(0)	Laboratory Control Sample	8/21/2023 10:59:25 PM	Valley	13C8-PFOA	Baseline
D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/2023 11:15:29 PM	Valley	13C8-PFOA	Valley
D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/2023 11:31:33 PM	Valley	13C8-PFOA	Valley
LZ87 CCV	CCV	8/22/2023 12:03:44 AM	Baseline	13C8-PFOA	Valley

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Manual Integration Report

Created with Analyst Reporter
Printed: 23/08/2023 10:35:39 AM

Analyte: PFNA_1 (463.0 / 419.0)

Data File	AD_08212023_5-369.wiff	**Result Table**	23-1034
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/21/2023 5:05:55 PM	Baseline	13C9-PFNA	Baseline
LZ84	L2	8/21/2023 5:21:58 PM	Baseline	13C9-PFNA	Baseline
LZ85	L3	8/21/2023 5:38:02 PM	Valley	13C9-PFNA	Baseline
LZ86	L4	8/21/2023 5:54:06 PM	Valley	13C9-PFNA	Valley
LZ87	L5	8/21/2023 6:10:10 PM	Valley	13C9-PFNA	Valley
LZ88	L6	8/21/2023 6:26:12 PM	Valley	13C9-PFNA	Baseline
LZ89	L7	8/21/2023 6:42:16 PM	Baseline	13C9-PFNA	Valley
LZ90	L8	8/21/2023 6:58:19 PM	Valley	13C9-PFNA	Valley
LZ91 IB	Instrument Blank	8/21/2023 7:14:23 PM	N/A	13C9-PFNA	Valley
LZ92 ICC	ICC	8/21/2023 7:30:28 PM	Baseline	13C9-PFNA	Valley
LZ86 CCV	CCV	8/21/2023 10:27:16 PM	Valley	13C9-PFNA	Valley
DO701PB-FS(0)	Procedural Blank	8/21/2023 10:43:21 PM	N/A	13C9-PFNA	Valley
DO702LCS-FS(0)	Laboratory Control Sample	8/21/2023 10:59:25 PM	Valley	13C9-PFNA	Baseline
D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/2023 11:15:29 PM	N/A	13C9-PFNA	Valley
D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/2023 11:31:33 PM	Valley	13C9-PFNA	Valley
LZ87 CCV	CCV	8/22/2023 12:03:44 AM	Baseline	13C9-PFNA	Valley

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Analyte: PFNA_2 (463.0 / 219.0)

Data File	AD_08212023_5-369.wiff	**Result Table**	23-1034
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/21/2023 5:05:55 PM	Baseline	13C9-PFNA	Baseline
LZ84	L2	8/21/2023 5:21:58 PM	Valley	13C9-PFNA	Baseline
LZ85	L3	8/21/2023 5:38:02 PM	Baseline	13C9-PFNA	Baseline
LZ86	L4	8/21/2023 5:54:06 PM	Valley	13C9-PFNA	Valley
LZ87	L5	8/21/2023 6:10:10 PM	Valley	13C9-PFNA	Valley
LZ88	L6	8/21/2023 6:26:12 PM	Valley	13C9-PFNA	Baseline
LZ89	L7	8/21/2023 6:42:16 PM	Baseline	13C9-PFNA	Valley
LZ90	L8	8/21/2023 6:58:19 PM	Valley	13C9-PFNA	Valley
LZ91 IB	Instrument Blank	8/21/2023 7:14:23 PM	N/A	13C9-PFNA	Valley
LZ92 ICC	ICC	8/21/2023 7:30:28 PM	Baseline	13C9-PFNA	Valley
LZ86 CCV	CCV	8/21/2023 10:27:16 PM	Valley	13C9-PFNA	Valley
DO701PB-FS(0)	Procedural Blank	8/21/2023 10:43:21 PM	N/A	13C9-PFNA	Valley
DO702LCS-FS(0)	Laboratory Control Sample	8/21/2023 10:59:25 PM	Valley	13C9-PFNA	Baseline
D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/2023 11:15:29 PM	N/A	13C9-PFNA	Valley
D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/2023 11:31:33 PM	Valley	13C9-PFNA	Valley
LZ87 CCV	CCV	8/22/2023 12:03:44 AM	Valley	13C9-PFNA	Valley

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Analyte: PFDA_1 (512.9 / 469.0)

Data File	AD_08212023_5-369.wiff	**Result Table**	23-1034
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/21/2023 5:05:55 PM	Baseline	13C6-PFDA	Valley
LZ84	L2	8/21/2023 5:21:58 PM	Valley	13C6-PFDA	Valley
LZ85	L3	8/21/2023 5:38:02 PM	Baseline	13C6-PFDA	Valley
LZ86	L4	8/21/2023 5:54:06 PM	Baseline	13C6-PFDA	Baseline
LZ87	L5	8/21/2023 6:10:10 PM	Baseline	13C6-PFDA	Valley
LZ88	L6	8/21/2023 6:26:12 PM	Baseline	13C6-PFDA	Valley
LZ89	L7	8/21/2023 6:42:16 PM	Valley	13C6-PFDA	Valley
LZ90	L8	8/21/2023 6:58:19 PM	Baseline	13C6-PFDA	Valley
LZ91 IB	Instrument Blank	8/21/2023 7:14:23 PM	N/A	13C6-PFDA	Baseline
LZ92 ICC	ICC	8/21/2023 7:30:28 PM	Valley	13C6-PFDA	Valley
LZ86 CCV	CCV	8/21/2023 10:27:16 PM	Valley	13C6-PFDA	Valley
DO701PB-FS(0)	Procedural Blank	8/21/2023 10:43:21 PM	N/A	13C6-PFDA	Valley
DO702LCS-FS(0)	Laboratory Control Sample	8/21/2023 10:59:25 PM	Valley	13C6-PFDA	Baseline
D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/2023 11:15:29 PM	N/A	13C6-PFDA	Baseline
D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/2023 11:31:33 PM	Baseline	13C6-PFDA	Baseline
LZ87 CCV	CCV	8/22/2023 12:03:44 AM	Baseline	13C6-PFDA	Valley

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Analyte: PFDA_2 (512.9 / 219.0)

Data File	AD_08212023_5-369.wiff	**Result Table**	23-1034
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/21/2023 5:05:55 PM	Baseline	13C6-PFDA	Valley
LZ84	L2	8/21/2023 5:21:58 PM	Baseline	13C6-PFDA	Valley
LZ85	L3	8/21/2023 5:38:02 PM	Baseline	13C6-PFDA	Valley
LZ86	L4	8/21/2023 5:54:06 PM	Baseline	13C6-PFDA	Baseline
LZ87	L5	8/21/2023 6:10:10 PM	Baseline	13C6-PFDA	Valley
LZ88	L6	8/21/2023 6:26:12 PM	Baseline	13C6-PFDA	Valley
LZ89	L7	8/21/2023 6:42:16 PM	Baseline	13C6-PFDA	Valley
LZ90	L8	8/21/2023 6:58:19 PM	Valley	13C6-PFDA	Valley
LZ91 IB	Instrument Blank	8/21/2023 7:14:23 PM	N/A	13C6-PFDA	Baseline
LZ92 ICC	ICC	8/21/2023 7:30:28 PM	Baseline	13C6-PFDA	Valley
LZ86 CCV	CCV	8/21/2023 10:27:16 PM	Baseline	13C6-PFDA	Valley
DO701PB-FS(0)	Procedural Blank	8/21/2023 10:43:21 PM	N/A	13C6-PFDA	Valley
DO702LCS-FS(0)	Laboratory Control Sample	8/21/2023 10:59:25 PM	Valley	13C6-PFDA	Baseline
D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/2023 11:15:29 PM	N/A	13C6-PFDA	Baseline
D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/2023 11:31:33 PM	N/A	13C6-PFDA	Baseline
LZ87 CCV	CCV	8/22/2023 12:03:44 AM	Valley	13C6-PFDA	Valley

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Analyte: PFUnA_1 (563.1 / 519.0)

Data File	AD_08212023_5-369.wiff	**Result Table**	23-1034
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/21/2023 5:05:55 PM	Valley	13C7-PFUnA	Valley
LZ84	L2	8/21/2023 5:21:58 PM	Valley	13C7-PFUnA	Valley
LZ85	L3	8/21/2023 5:38:02 PM	Valley	13C7-PFUnA	Valley
LZ86	L4	8/21/2023 5:54:06 PM	Valley	13C7-PFUnA	Valley
LZ87	L5	8/21/2023 6:10:10 PM	Baseline	13C7-PFUnA	Valley
LZ88	L6	8/21/2023 6:26:12 PM	Baseline	13C7-PFUnA	Baseline
LZ89	L7	8/21/2023 6:42:16 PM	Baseline	13C7-PFUnA	Valley
LZ90	L8	8/21/2023 6:58:19 PM	Valley	13C7-PFUnA	Baseline
LZ91 IB	Instrument Blank	8/21/2023 7:14:23 PM	Valley	13C7-PFUnA	Valley
LZ92 ICC	ICC	8/21/2023 7:30:28 PM	Baseline	13C7-PFUnA	Baseline
LZ86 CCV	CCV	8/21/2023 10:27:16 PM	Valley	13C7-PFUnA	Valley
DO701PB-FS(0)	Procedural Blank	8/21/2023 10:43:21 PM	N/A	13C7-PFUnA	Baseline
DO702LCS-FS(0)	Laboratory Control Sample	8/21/2023 10:59:25 PM	Valley	13C7-PFUnA	Valley
D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/2023 11:15:29 PM	N/A	13C7-PFUnA	Valley
D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/2023 11:31:33 PM	N/A	13C7-PFUnA	Valley
LZ87 CCV	CCV	8/22/2023 12:03:44 AM	Valley	13C7-PFUnA	Valley

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Analyte: PFUnA_2 (563.1 / 269.1)

Data File	AD_08212023_5-369.wiff	**Result Table**	23-1034
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/21/2023 5:05:55 PM	Baseline	13C7-PFUnA	Valley
LZ84	L2	8/21/2023 5:21:58 PM	Baseline	13C7-PFUnA	Valley
LZ85	L3	8/21/2023 5:38:02 PM	Valley	13C7-PFUnA	Valley
LZ86	L4	8/21/2023 5:54:06 PM	Baseline	13C7-PFUnA	Valley
LZ87	L5	8/21/2023 6:10:10 PM	Valley	13C7-PFUnA	Valley
LZ88	L6	8/21/2023 6:26:12 PM	Valley	13C7-PFUnA	Baseline
LZ89	L7	8/21/2023 6:42:16 PM	Valley	13C7-PFUnA	Valley
LZ90	L8	8/21/2023 6:58:19 PM	Baseline	13C7-PFUnA	Baseline
LZ91 IB	Instrument Blank	8/21/2023 7:14:23 PM	Baseline	13C7-PFUnA	Valley
LZ92 ICC	ICC	8/21/2023 7:30:28 PM	Valley	13C7-PFUnA	Baseline
LZ86 CCV	CCV	8/21/2023 10:27:16 PM	Valley	13C7-PFUnA	Valley
DO701PB-FS(0)	Procedural Blank	8/21/2023 10:43:21 PM	N/A	13C7-PFUnA	Baseline
DO702LCS-FS(0)	Laboratory Control Sample	8/21/2023 10:59:25 PM	Baseline	13C7-PFUnA	Valley
D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/2023 11:15:29 PM	N/A	13C7-PFUnA	Valley
D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/2023 11:31:33 PM	N/A	13C7-PFUnA	Valley
LZ87 CCV	CCV	8/22/2023 12:03:44 AM	Valley	13C7-PFUnA	Valley

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Analyte: PFDoA_1 (613.1 / 569.0)

Data File	AD_08212023_5-369.wiff	**Result Table**	23-1034
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/21/2023 5:05:55 PM	Baseline	13C2-PFDoA	Valley
LZ84	L2	8/21/2023 5:21:58 PM	Valley	13C2-PFDoA	Valley
LZ85	L3	8/21/2023 5:38:02 PM	Baseline	13C2-PFDoA	Valley
LZ86	L4	8/21/2023 5:54:06 PM	Valley	13C2-PFDoA	Valley
LZ87	L5	8/21/2023 6:10:10 PM	Baseline	13C2-PFDoA	Valley
LZ88	L6	8/21/2023 6:26:12 PM	Valley	13C2-PFDoA	Valley
LZ89	L7	8/21/2023 6:42:16 PM	Valley	13C2-PFDoA	Valley
LZ90	L8	8/21/2023 6:58:19 PM	Valley	13C2-PFDoA	Valley
LZ91 IB	Instrument Blank	8/21/2023 7:14:23 PM	Valley	13C2-PFDoA	Baseline
LZ92 ICC	ICC	8/21/2023 7:30:28 PM	Valley	13C2-PFDoA	Valley
LZ86 CCV	CCV	8/21/2023 10:27:16 PM	Valley	13C2-PFDoA	Valley
DO701PB-FS(0)	Procedural Blank	8/21/2023 10:43:21 PM	N/A	13C2-PFDoA	Valley
DO702LCS-FS(0)	Laboratory Control Sample	8/21/2023 10:59:25 PM	Baseline	13C2-PFDoA	Valley
D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/2023 11:15:29 PM	N/A	13C2-PFDoA	Valley
D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/2023 11:31:33 PM	N/A	13C2-PFDoA	Valley
LZ87 CCV	CCV	8/22/2023 12:03:44 AM	Valley	13C2-PFDoA	Valley

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Analyte: PFDoA_2 (613.1 / 319.0)

Data File	AD_08212023_5-369.wiff	**Result Table**	23-1034
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/21/2023 5:05:55 PM	Valley	13C2-PFDoA	Valley
LZ84	L2	8/21/2023 5:21:58 PM	Baseline	13C2-PFDoA	Valley
LZ85	L3	8/21/2023 5:38:02 PM	Baseline	13C2-PFDoA	Valley
LZ86	L4	8/21/2023 5:54:06 PM	Valley	13C2-PFDoA	Valley
LZ87	L5	8/21/2023 6:10:10 PM	Valley	13C2-PFDoA	Valley
LZ88	L6	8/21/2023 6:26:12 PM	Valley	13C2-PFDoA	Valley
LZ89	L7	8/21/2023 6:42:16 PM	Baseline	13C2-PFDoA	Valley
LZ90	L8	8/21/2023 6:58:19 PM	Valley	13C2-PFDoA	Valley
LZ91 IB	Instrument Blank	8/21/2023 7:14:23 PM	Baseline	13C2-PFDoA	Baseline
LZ92 ICC	ICC	8/21/2023 7:30:28 PM	Valley	13C2-PFDoA	Valley
LZ86 CCV	CCV	8/21/2023 10:27:16 PM	Baseline	13C2-PFDoA	Valley
DO701PB-FS(0)	Procedural Blank	8/21/2023 10:43:21 PM	N/A	13C2-PFDoA	Valley
DO702LCS-FS(0)	Laboratory Control Sample	8/21/2023 10:59:25 PM	Valley	13C2-PFDoA	Valley
D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/2023 11:15:29 PM	N/A	13C2-PFDoA	Valley
D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/2023 11:31:33 PM	N/A	13C2-PFDoA	Valley
LZ87 CCV	CCV	8/22/2023 12:03:44 AM	Valley	13C2-PFDoA	Valley

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Analyte: PFTrDA_1 (663.0 / 619.0)

Data File	AD_08212023_5-369.wiff	**Result Table**	23-1034
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/21/2023 5:05:55 PM	Valley	13C2-PFTeDA	Valley
LZ84	L2	8/21/2023 5:21:58 PM	Valley	13C2-PFTeDA	Valley
LZ85	L3	8/21/2023 5:38:02 PM	Baseline	13C2-PFTeDA	Valley
LZ86	L4	8/21/2023 5:54:06 PM	Valley	13C2-PFTeDA	Valley
LZ87	L5	8/21/2023 6:10:10 PM	Valley	13C2-PFTeDA	Valley
LZ88	L6	8/21/2023 6:26:12 PM	Baseline	13C2-PFTeDA	Valley
LZ89	L7	8/21/2023 6:42:16 PM	Valley	13C2-PFTeDA	Valley
LZ90	L8	8/21/2023 6:58:19 PM	Valley	13C2-PFTeDA	Valley
LZ91 IB	Instrument Blank	8/21/2023 7:14:23 PM	Valley	13C2-PFTeDA	Valley
LZ92 ICC	ICC	8/21/2023 7:30:28 PM	Baseline	13C2-PFTeDA	Valley
LZ86 CCV	CCV	8/21/2023 10:27:16 PM	Valley	13C2-PFTeDA	Valley
DO701PB-FS(0)	Procedural Blank	8/21/2023 10:43:21 PM	Valley	13C2-PFTeDA	Valley
DO702LCS-FS(0)	Laboratory Control Sample	8/21/2023 10:59:25 PM	Valley	13C2-PFTeDA	Valley
D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/2023 11:15:29 PM	N/A	13C2-PFTeDA	Valley
D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/2023 11:31:33 PM	N/A	13C2-PFTeDA	Valley
LZ87 CCV	CCV	8/22/2023 12:03:44 AM	Baseline	13C2-PFTeDA	Valley

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Analyte: PFTrDA_2 (663.0 / 168.9)

Data File	AD_08212023_5-369.wiff	**Result Table**	23-1034
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/21/2023 5:05:55 PM	Baseline	13C2-PFTeDA	Valley
LZ84	L2	8/21/2023 5:21:58 PM	Valley	13C2-PFTeDA	Valley
LZ85	L3	8/21/2023 5:38:02 PM	Baseline	13C2-PFTeDA	Valley
LZ86	L4	8/21/2023 5:54:06 PM	Baseline	13C2-PFTeDA	Valley
LZ87	L5	8/21/2023 6:10:10 PM	Valley	13C2-PFTeDA	Valley
LZ88	L6	8/21/2023 6:26:12 PM	Valley	13C2-PFTeDA	Valley
LZ89	L7	8/21/2023 6:42:16 PM	Valley	13C2-PFTeDA	Valley
LZ90	L8	8/21/2023 6:58:19 PM	Baseline	13C2-PFTeDA	Valley
LZ91 IB	Instrument Blank	8/21/2023 7:14:23 PM	Valley	13C2-PFTeDA	Valley
LZ92 ICC	ICC	8/21/2023 7:30:28 PM	Valley	13C2-PFTeDA	Valley
LZ86 CCV	CCV	8/21/2023 10:27:16 PM	Baseline	13C2-PFTeDA	Valley
DO701PB-FS(0)	Procedural Blank	8/21/2023 10:43:21 PM	N/A	13C2-PFTeDA	Valley
DO702LCS-FS(0)	Laboratory Control Sample	8/21/2023 10:59:25 PM	Baseline	13C2-PFTeDA	Valley
D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/2023 11:15:29 PM	N/A	13C2-PFTeDA	Valley
D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/2023 11:31:33 PM	N/A	13C2-PFTeDA	Valley
LZ87 CCV	CCV	8/22/2023 12:03:44 AM	Valley	13C2-PFTeDA	Valley

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Analyte: PFTeDA_1 (713.0 / 669.0)

Data File	AD_08212023_5-369.wiff	**Result Table**	23-1034
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/21/2023 5:05:55 PM	Valley	13C2-PFTeDA	Valley
LZ84	L2	8/21/2023 5:21:58 PM	Baseline	13C2-PFTeDA	Valley
LZ85	L3	8/21/2023 5:38:02 PM	Valley	13C2-PFTeDA	Valley
LZ86	L4	8/21/2023 5:54:06 PM	Valley	13C2-PFTeDA	Valley
LZ87	L5	8/21/2023 6:10:10 PM	Valley	13C2-PFTeDA	Valley
LZ88	L6	8/21/2023 6:26:12 PM	Valley	13C2-PFTeDA	Valley
LZ89	L7	8/21/2023 6:42:16 PM	Valley	13C2-PFTeDA	Valley
LZ90	L8	8/21/2023 6:58:19 PM	Valley	13C2-PFTeDA	Valley
LZ91 IB	Instrument Blank	8/21/2023 7:14:23 PM	Valley	13C2-PFTeDA	Valley
LZ92 ICC	ICC	8/21/2023 7:30:28 PM	Baseline	13C2-PFTeDA	Valley
LZ86 CCV	CCV	8/21/2023 10:27:16 PM	Baseline	13C2-PFTeDA	Valley
DO701PB-FS(0)	Procedural Blank	8/21/2023 10:43:21 PM	N/A	13C2-PFTeDA	Valley
DO702LCS-FS(0)	Laboratory Control Sample	8/21/2023 10:59:25 PM	Valley	13C2-PFTeDA	Valley
D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/2023 11:15:29 PM	N/A	13C2-PFTeDA	Valley
D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/2023 11:31:33 PM	N/A	13C2-PFTeDA	Valley
LZ87 CCV	CCV	8/22/2023 12:03:44 AM	Baseline	13C2-PFTeDA	Valley

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Manual Integration Report

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Analyte: PFTeDA_2 (713.0 / 168.9)

Data File	AD_08212023_5-369.wiff	**Result Table**	23-1034
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/21/2023 5:05:55 PM	Baseline	13C2-PFTeDA	Valley
LZ84	L2	8/21/2023 5:21:58 PM	Baseline	13C2-PFTeDA	Valley
LZ85	L3	8/21/2023 5:38:02 PM	Baseline	13C2-PFTeDA	Valley
LZ86	L4	8/21/2023 5:54:06 PM	Valley	13C2-PFTeDA	Valley
LZ87	L5	8/21/2023 6:10:10 PM	Baseline	13C2-PFTeDA	Valley
LZ88	L6	8/21/2023 6:26:12 PM	Valley	13C2-PFTeDA	Valley
LZ89	L7	8/21/2023 6:42:16 PM	Valley	13C2-PFTeDA	Valley
LZ90	L8	8/21/2023 6:58:19 PM	Valley	13C2-PFTeDA	Valley
LZ91 IB	Instrument Blank	8/21/2023 7:14:23 PM	Valley	13C2-PFTeDA	Valley
LZ92 ICC	ICC	8/21/2023 7:30:28 PM	Valley	13C2-PFTeDA	Valley
LZ86 CCV	CCV	8/21/2023 10:27:16 PM	Baseline	13C2-PFTeDA	Valley
DO701PB-FS(0)	Procedural Blank	8/21/2023 10:43:21 PM	N/A	13C2-PFTeDA	Valley
DO702LCS-FS(0)	Laboratory Control Sample	8/21/2023 10:59:25 PM	Baseline	13C2-PFTeDA	Valley
D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/2023 11:15:29 PM	N/A	13C2-PFTeDA	Valley
D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/2023 11:31:33 PM	N/A	13C2-PFTeDA	Valley
LZ87 CCV	CCV	8/22/2023 12:03:44 AM	Baseline	13C2-PFTeDA	Valley

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Analyte: PFBS_1 (298.7 / 79.9)

Data File	AD_08212023_5-369.wiff	**Result Table**	23-1034
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/21/2023 5:05:55 PM	Valley	13C3-PFBS	Valley
LZ84	L2	8/21/2023 5:21:58 PM	Valley	13C3-PFBS	Baseline
LZ85	L3	8/21/2023 5:38:02 PM	Valley	13C3-PFBS	Baseline
LZ86	L4	8/21/2023 5:54:06 PM	Baseline	13C3-PFBS	Valley
LZ87	L5	8/21/2023 6:10:10 PM	Valley	13C3-PFBS	Valley
LZ88	L6	8/21/2023 6:26:12 PM	Valley	13C3-PFBS	Valley
LZ89	L7	8/21/2023 6:42:16 PM	Baseline	13C3-PFBS	Valley
LZ90	L8	8/21/2023 6:58:19 PM	Baseline	13C3-PFBS	Valley
LZ91 IB	Instrument Blank	8/21/2023 7:14:23 PM	N/A	13C3-PFBS	Valley
LZ92 ICC	ICC	8/21/2023 7:30:28 PM	Valley	13C3-PFBS	Baseline
LZ86 CCV	CCV	8/21/2023 10:27:16 PM	Valley	13C3-PFBS	Baseline
DO701PB-FS(0)	Procedural Blank	8/21/2023 10:43:21 PM	N/A	13C3-PFBS	Valley
DO702LCS-FS(0)	Laboratory Control Sample	8/21/2023 10:59:25 PM	Valley	13C3-PFBS	Baseline
D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/2023 11:15:29 PM	N/A	13C3-PFBS	Valley
D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/2023 11:31:33 PM	Valley	13C3-PFBS	Baseline
LZ87 CCV	CCV	8/22/2023 12:03:44 AM	Valley	13C3-PFBS	Valley

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Manual Integration Report

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Analyte: PFBS_2 (298.9 / 98.8)

Data File	AD_08212023_5-369.wiff	Result Table	23-1034
Acquisition Method	5-369_ACN.dam	Instrument Name	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/21/2023 5:05:55 PM	Baseline	13C3-PFBS	Valley
LZ84	L2	8/21/2023 5:21:58 PM	Baseline	13C3-PFBS	Baseline
LZ85	L3	8/21/2023 5:38:02 PM	Valley	13C3-PFBS	Baseline
LZ86	L4	8/21/2023 5:54:06 PM	Baseline	13C3-PFBS	Valley
LZ87	L5	8/21/2023 6:10:10 PM	Valley	13C3-PFBS	Valley
LZ88	L6	8/21/2023 6:26:12 PM	Valley	13C3-PFBS	Valley
LZ89	L7	8/21/2023 6:42:16 PM	Baseline	13C3-PFBS	Valley
LZ90	L8	8/21/2023 6:58:19 PM	Valley	13C3-PFBS	Valley
LZ91 IB	Instrument Blank	8/21/2023 7:14:23 PM	N/A	13C3-PFBS	Valley
LZ92 ICC	ICC	8/21/2023 7:30:28 PM	Valley	13C3-PFBS	Baseline
LZ86 CCV	CCV	8/21/2023 10:27:16 PM	Valley	13C3-PFBS	Baseline
DO701PB-FS(0)	Procedural Blank	8/21/2023 10:43:21 PM	N/A	13C3-PFBS	Valley
DO702LCS-FS(0)	Laboratory Control Sample	8/21/2023 10:59:25 PM	Baseline	13C3-PFBS	Baseline
D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/2023 11:15:29 PM	N/A	13C3-PFBS	Valley
D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/2023 11:31:33 PM	Valley	13C3-PFBS	Baseline
LZ87 CCV	CCV	8/22/2023 12:03:44 AM	Baseline	13C3-PFBS	Valley

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Analyte: PFHxS_1 (399.0 / 80.0)

Data File	AD_08212023_5-369.wiff	**Result Table**	23-1034
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/21/2023 5:05:55 PM	Baseline	13C3-PFHxS	Baseline
LZ84	L2	8/21/2023 5:21:58 PM	Baseline	13C3-PFHxS	Valley
LZ85	L3	8/21/2023 5:38:02 PM	Valley	13C3-PFHxS	Valley
LZ86	L4	8/21/2023 5:54:06 PM	Valley	13C3-PFHxS	Valley
LZ87	L5	8/21/2023 6:10:10 PM	Valley	13C3-PFHxS	Valley
LZ88	L6	8/21/2023 6:26:12 PM	Baseline	13C3-PFHxS	Valley
LZ89	L7	8/21/2023 6:42:16 PM	Baseline	13C3-PFHxS	Valley
LZ90	L8	8/21/2023 6:58:19 PM	Valley	13C3-PFHxS	Baseline
LZ91 IB	Instrument Blank	8/21/2023 7:14:23 PM	N/A	13C3-PFHxS	Baseline
LZ92 ICC	ICC	8/21/2023 7:30:28 PM	Baseline	13C3-PFHxS	Baseline
LZ86 CCV	CCV	8/21/2023 10:27:16 PM	Valley	13C3-PFHxS	Baseline
DO701PB-FS(0)	Procedural Blank	8/21/2023 10:43:21 PM	Baseline	13C3-PFHxS	Valley
DO702LCS-FS(0)	Laboratory Control Sample	8/21/2023 10:59:25 PM	Baseline	13C3-PFHxS	Valley
D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/2023 11:15:29 PM	Baseline	13C3-PFHxS	Valley
D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/2023 11:31:33 PM	Baseline	13C3-PFHxS	Valley
LZ87 CCV	CCV	8/22/2023 12:03:44 AM	Valley	13C3-PFHxS	Valley

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Manual Integration Report

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Analyte: PFHxS_2 (399.0 / 99.0)

Data File	AD_08212023_5-369.wiff	**Result Table**	23-1034
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/21/2023 5:05:55 PM	Valley	13C3-PFHxS	Baseline
LZ84	L2	8/21/2023 5:21:58 PM	Baseline	13C3-PFHxS	Valley
LZ85	L3	8/21/2023 5:38:02 PM	Valley	13C3-PFHxS	Valley
LZ86	L4	8/21/2023 5:54:06 PM	Valley	13C3-PFHxS	Valley
LZ87	L5	8/21/2023 6:10:10 PM	Valley	13C3-PFHxS	Valley
LZ88	L6	8/21/2023 6:26:12 PM	Valley	13C3-PFHxS	Valley
LZ89	L7	8/21/2023 6:42:16 PM	Valley	13C3-PFHxS	Valley
LZ90	L8	8/21/2023 6:58:19 PM	Valley	13C3-PFHxS	Baseline
LZ91 IB	Instrument Blank	8/21/2023 7:14:23 PM	N/A	13C3-PFHxS	Baseline
LZ92 ICC	ICC	8/21/2023 7:30:28 PM	Valley	13C3-PFHxS	Baseline
LZ86 CCV	CCV	8/21/2023 10:27:16 PM	Baseline	13C3-PFHxS	Baseline
DO701PB-FS(0)	Procedural Blank	8/21/2023 10:43:21 PM	N/A	13C3-PFHxS	Valley
DO702LCS-FS(0)	Laboratory Control Sample	8/21/2023 10:59:25 PM	Baseline	13C3-PFHxS	Valley
D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/2023 11:15:29 PM	Baseline	13C3-PFHxS	Valley
D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/2023 11:31:33 PM	Valley	13C3-PFHxS	Valley
LZ87 CCV	CCV	8/22/2023 12:03:44 AM	Baseline	13C3-PFHxS	Valley

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Analyte: PFOS_1 (498.9 / 79.9)

Data File	AD_08212023_5-369.wiff	**Result Table**	23-1034
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/21/2023 5:05:55 PM	Baseline	13C8-PFOS	Valley
LZ84	L2	8/21/2023 5:21:58 PM	Baseline	13C8-PFOS	Valley
LZ85	L3	8/21/2023 5:38:02 PM	Baseline	13C8-PFOS	Valley
LZ86	L4	8/21/2023 5:54:06 PM	Baseline	13C8-PFOS	Valley
LZ87	L5	8/21/2023 6:10:10 PM	Valley	13C8-PFOS	Valley
LZ88	L6	8/21/2023 6:26:12 PM	Baseline	13C8-PFOS	Valley
LZ89	L7	8/21/2023 6:42:16 PM	Valley	13C8-PFOS	Valley
LZ90	L8	8/21/2023 6:58:19 PM	Baseline	13C8-PFOS	Valley
LZ91 IB	Instrument Blank	8/21/2023 7:14:23 PM	N/A	13C8-PFOS	Valley
LZ92 ICC	ICC	8/21/2023 7:30:28 PM	Baseline	13C8-PFOS	Valley
LZ86 CCV	CCV	8/21/2023 10:27:16 PM	Valley	13C8-PFOS	Baseline
DO701PB-FS(0)	Procedural Blank	8/21/2023 10:43:21 PM	N/A	13C8-PFOS	Valley
DO702LCS-FS(0)	Laboratory Control Sample	8/21/2023 10:59:25 PM	Valley	13C8-PFOS	Valley
D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/2023 11:15:29 PM	Manual	13C8-PFOS	Valley
D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/2023 11:31:33 PM	Manual	13C8-PFOS	Valley
LZ87 CCV	CCV	8/22/2023 12:03:44 AM	Baseline	13C8-PFOS	Valley

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Analyte: PFOS_2 (498.9 / 98.9)

Data File	AD_08212023_5-369.wiff	**Result Table**	23-1034
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/21/2023 5:05:55 PM	Baseline	13C8-PFOS	Valley
LZ84	L2	8/21/2023 5:21:58 PM	Baseline	13C8-PFOS	Valley
LZ85	L3	8/21/2023 5:38:02 PM	Baseline	13C8-PFOS	Valley
LZ86	L4	8/21/2023 5:54:06 PM	Baseline	13C8-PFOS	Valley
LZ87	L5	8/21/2023 6:10:10 PM	Baseline	13C8-PFOS	Valley
LZ88	L6	8/21/2023 6:26:12 PM	Baseline	13C8-PFOS	Valley
LZ89	L7	8/21/2023 6:42:16 PM	Baseline	13C8-PFOS	Valley
LZ90	L8	8/21/2023 6:58:19 PM	Baseline	13C8-PFOS	Valley
LZ91 IB	Instrument Blank	8/21/2023 7:14:23 PM	N/A	13C8-PFOS	Valley
LZ92 ICC	ICC	8/21/2023 7:30:28 PM	Manual	13C8-PFOS	Valley
LZ86 CCV	CCV	8/21/2023 10:27:16 PM	Valley	13C8-PFOS	Baseline
DO701PB-FS(0)	Procedural Blank	8/21/2023 10:43:21 PM	N/A	13C8-PFOS	Valley
DO702LCS-FS(0)	Laboratory Control Sample	8/21/2023 10:59:25 PM	Baseline	13C8-PFOS	Valley
D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/2023 11:15:29 PM	Baseline	13C8-PFOS	Valley
D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/2023 11:31:33 PM	Baseline	13C8-PFOS	Valley
LZ87 CCV	CCV	8/22/2023 12:03:44 AM	Valley	13C8-PFOS	Valley

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Printed: 23/08/2023 10:35:39 AM

Analyte: NMeFOSAA_1 (570.1 / 419.0)

Data File	AD_08212023_5-369.wiff	Result Table	23-1034
Acquisition Method	5-369_ACN.dam	Instrument Name	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/21/2023 5:05:55 PM	Baseline	d3-MeFOSAA	Baseline
LZ84	L2	8/21/2023 5:21:58 PM	Valley	d3-MeFOSAA	Baseline
LZ85	L3	8/21/2023 5:38:02 PM	Baseline	d3-MeFOSAA	Valley
LZ86	L4	8/21/2023 5:54:06 PM	Valley	d3-MeFOSAA	Valley
LZ87	L5	8/21/2023 6:10:10 PM	Valley	d3-MeFOSAA	Valley
LZ88	L6	8/21/2023 6:26:12 PM	Baseline	d3-MeFOSAA	Valley
LZ89	L7	8/21/2023 6:42:16 PM	Valley	d3-MeFOSAA	Baseline
LZ90	L8	8/21/2023 6:58:19 PM	Valley	d3-MeFOSAA	Baseline
LZ91 IB	Instrument Blank	8/21/2023 7:14:23 PM	N/A	d3-MeFOSAA	Valley
LZ92 ICC	ICC	8/21/2023 7:30:28 PM	Valley	d3-MeFOSAA	Valley
LZ86 CCV	CCV	8/21/2023 10:27:16 PM	Valley	d3-MeFOSAA	Baseline
DO701PB-FS(0)	Procedural Blank	8/21/2023 10:43:21 PM	N/A	d3-MeFOSAA	Valley
DO702LCS-FS(0)	Laboratory Control Sample	8/21/2023 10:59:25 PM	Valley	d3-MeFOSAA	Valley
D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/2023 11:15:29 PM	N/A	d3-MeFOSAA	Baseline
D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/2023 11:31:33 PM	N/A	d3-MeFOSAA	Valley
LZ87 CCV	CCV	8/22/2023 12:03:44 AM	Valley	d3-MeFOSAA	Baseline

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Manual Integration Report

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Printed: 23/08/2023 10:35:39 AM

Analyte: NMeFOSAA_2 (570.1 / 483.0)

Data File	AD_08212023_5-369.wiff	**Result Table**	23-1034
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/21/2023 5:05:55 PM	Baseline	d3-MeFOSAA	Baseline
LZ84	L2	8/21/2023 5:21:58 PM	Baseline	d3-MeFOSAA	Baseline
LZ85	L3	8/21/2023 5:38:02 PM	Baseline	d3-MeFOSAA	Valley
LZ86	L4	8/21/2023 5:54:06 PM	Baseline	d3-MeFOSAA	Valley
LZ87	L5	8/21/2023 6:10:10 PM	Baseline	d3-MeFOSAA	Valley
LZ88	L6	8/21/2023 6:26:12 PM	Baseline	d3-MeFOSAA	Valley
LZ89	L7	8/21/2023 6:42:16 PM	Baseline	d3-MeFOSAA	Baseline
LZ90	L8	8/21/2023 6:58:19 PM	Baseline	d3-MeFOSAA	Baseline
LZ91 IB	Instrument Blank	8/21/2023 7:14:23 PM	N/A	d3-MeFOSAA	Valley
LZ92 ICC	ICC	8/21/2023 7:30:28 PM	Baseline	d3-MeFOSAA	Valley
LZ86 CCV	CCV	8/21/2023 10:27:16 PM	Baseline	d3-MeFOSAA	Baseline
DO701PB-FS(0)	Procedural Blank	8/21/2023 10:43:21 PM	N/A	d3-MeFOSAA	Valley
DO702LCS-FS(0)	Laboratory Control Sample	8/21/2023 10:59:25 PM	Baseline	d3-MeFOSAA	Valley
D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/2023 11:15:29 PM	N/A	d3-MeFOSAA	Baseline
D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/2023 11:31:33 PM	N/A	d3-MeFOSAA	Valley
LZ87 CCV	CCV	8/22/2023 12:03:44 AM	Baseline	d3-MeFOSAA	Baseline

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Analyte: NEtFOSAA_1 (584.2 / 419.1)

Data File	AD_08212023_5-369.wiff	**Result Table**	23-1034
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/21/2023 5:05:55 PM	Baseline	d5-EtFOSAA	Valley
LZ84	L2	8/21/2023 5:21:58 PM	Valley	d5-EtFOSAA	Valley
LZ85	L3	8/21/2023 5:38:02 PM	Valley	d5-EtFOSAA	Valley
LZ86	L4	8/21/2023 5:54:06 PM	Valley	d5-EtFOSAA	Baseline
LZ87	L5	8/21/2023 6:10:10 PM	Baseline	d5-EtFOSAA	Valley
LZ88	L6	8/21/2023 6:26:12 PM	Valley	d5-EtFOSAA	Valley
LZ89	L7	8/21/2023 6:42:16 PM	Valley	d5-EtFOSAA	Valley
LZ90	L8	8/21/2023 6:58:19 PM	Baseline	d5-EtFOSAA	Valley
LZ91 IB	Instrument Blank	8/21/2023 7:14:23 PM	N/A	d5-EtFOSAA	Baseline
LZ92 ICC	ICC	8/21/2023 7:30:28 PM	Valley	d5-EtFOSAA	Baseline
LZ86 CCV	CCV	8/21/2023 10:27:16 PM	Valley	d5-EtFOSAA	Valley
DO701PB-FS(0)	Procedural Blank	8/21/2023 10:43:21 PM	N/A	d5-EtFOSAA	Valley
DO702LCS-FS(0)	Laboratory Control Sample	8/21/2023 10:59:25 PM	Valley	d5-EtFOSAA	Valley
D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/2023 11:15:29 PM	N/A	d5-EtFOSAA	Baseline
D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/2023 11:31:33 PM	N/A	d5-EtFOSAA	Baseline
LZ87 CCV	CCV	8/22/2023 12:03:44 AM	Valley	d5-EtFOSAA	Valley

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Analyte: NEtFOSAA_2 (584.2 / 526.0)

Data File	AD_08212023_5-369.wiff	**Result Table**	23-1034
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/21/2023 5:05:55 PM	Baseline	d5-EtFOSAA	Valley
LZ84	L2	8/21/2023 5:21:58 PM	Valley	d5-EtFOSAA	Valley
LZ85	L3	8/21/2023 5:38:02 PM	Baseline	d5-EtFOSAA	Valley
LZ86	L4	8/21/2023 5:54:06 PM	Baseline	d5-EtFOSAA	Baseline
LZ87	L5	8/21/2023 6:10:10 PM	Valley	d5-EtFOSAA	Valley
LZ88	L6	8/21/2023 6:26:12 PM	Baseline	d5-EtFOSAA	Valley
LZ89	L7	8/21/2023 6:42:16 PM	Valley	d5-EtFOSAA	Valley
LZ90	L8	8/21/2023 6:58:19 PM	Valley	d5-EtFOSAA	Valley
LZ91 IB	Instrument Blank	8/21/2023 7:14:23 PM	N/A	d5-EtFOSAA	Baseline
LZ92 ICC	ICC	8/21/2023 7:30:28 PM	Baseline	d5-EtFOSAA	Baseline
LZ86 CCV	CCV	8/21/2023 10:27:16 PM	Valley	d5-EtFOSAA	Valley
DO701PB-FS(0)	Procedural Blank	8/21/2023 10:43:21 PM	N/A	d5-EtFOSAA	Valley
DO702LCS-FS(0)	Laboratory Control Sample	8/21/2023 10:59:25 PM	Valley	d5-EtFOSAA	Valley
D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/2023 11:15:29 PM	N/A	d5-EtFOSAA	Baseline
D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/2023 11:31:33 PM	N/A	d5-EtFOSAA	Baseline
LZ87 CCV	CCV	8/22/2023 12:03:44 AM	Baseline	d5-EtFOSAA	Valley

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Printed: 23/08/2023 10:35:39 AM

Analyte: HFPO-DA_1 (284.9 / 168.9)

Data File	AD_08212023_5-369.wiff	**Result Table**	23-1034
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/21/2023 5:05:55 PM	Valley	13C3-HFPO-DA	Valley
LZ84	L2	8/21/2023 5:21:58 PM	Valley	13C3-HFPO-DA	Valley
LZ85	L3	8/21/2023 5:38:02 PM	Valley	13C3-HFPO-DA	Valley
LZ86	L4	8/21/2023 5:54:06 PM	Valley	13C3-HFPO-DA	Valley
LZ87	L5	8/21/2023 6:10:10 PM	Valley	13C3-HFPO-DA	Valley
LZ88	L6	8/21/2023 6:26:12 PM	Valley	13C3-HFPO-DA	Baseline
LZ89	L7	8/21/2023 6:42:16 PM	Valley	13C3-HFPO-DA	Baseline
LZ90	L8	8/21/2023 6:58:19 PM	Valley	13C3-HFPO-DA	Valley
LZ91 IB	Instrument Blank	8/21/2023 7:14:23 PM	N/A	13C3-HFPO-DA	Valley
LZ92 ICC	ICC	8/21/2023 7:30:28 PM	Valley	13C3-HFPO-DA	Baseline
LZ86 CCV	CCV	8/21/2023 10:27:16 PM	Valley	13C3-HFPO-DA	Valley
DO701PB-FS(0)	Procedural Blank	8/21/2023 10:43:21 PM	N/A	13C3-HFPO-DA	Valley
DO702LCS-FS(0)	Laboratory Control Sample	8/21/2023 10:59:25 PM	Valley	13C3-HFPO-DA	Valley
D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/2023 11:15:29 PM	N/A	13C3-HFPO-DA	Valley
D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/2023 11:31:33 PM	N/A	13C3-HFPO-DA	Valley
LZ87 CCV	CCV	8/22/2023 12:03:44 AM	Valley	13C3-HFPO-DA	Baseline

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Manual Integration Report

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Analyte: HFPO-DA_2 (284.9 / 184.9)

Data File	AD_08212023_5-369.wiff	**Result Table**	23-1034
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/21/2023 5:05:55 PM	Baseline	13C3-HFPO-DA	Valley
LZ84	L2	8/21/2023 5:21:58 PM	Baseline	13C3-HFPO-DA	Valley
LZ85	L3	8/21/2023 5:38:02 PM	Valley	13C3-HFPO-DA	Valley
LZ86	L4	8/21/2023 5:54:06 PM	Valley	13C3-HFPO-DA	Valley
LZ87	L5	8/21/2023 6:10:10 PM	Valley	13C3-HFPO-DA	Valley
LZ88	L6	8/21/2023 6:26:12 PM	Valley	13C3-HFPO-DA	Baseline
LZ89	L7	8/21/2023 6:42:16 PM	Valley	13C3-HFPO-DA	Baseline
LZ90	L8	8/21/2023 6:58:19 PM	Baseline	13C3-HFPO-DA	Valley
LZ91 IB	Instrument Blank	8/21/2023 7:14:23 PM	N/A	13C3-HFPO-DA	Valley
LZ92 ICC	ICC	8/21/2023 7:30:28 PM	Baseline	13C3-HFPO-DA	Baseline
LZ86 CCV	CCV	8/21/2023 10:27:16 PM	Baseline	13C3-HFPO-DA	Valley
DO701PB-FS(0)	Procedural Blank	8/21/2023 10:43:21 PM	N/A	13C3-HFPO-DA	Valley
DO702LCS-FS(0)	Laboratory Control Sample	8/21/2023 10:59:25 PM	Baseline	13C3-HFPO-DA	Valley
D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/2023 11:15:29 PM	N/A	13C3-HFPO-DA	Valley
D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/2023 11:31:33 PM	N/A	13C3-HFPO-DA	Valley
LZ87 CCV	CCV	8/22/2023 12:03:44 AM	Valley	13C3-HFPO-DA	Baseline

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Analyte: ADONA_1 (376.9 / 250.9)

Data File	AD_08212023_5-369.wiff	**Result Table**	23-1034
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/21/2023 5:05:55 PM	Valley	13C8-PFOA	Valley
LZ84	L2	8/21/2023 5:21:58 PM	Valley	13C8-PFOA	Valley
LZ85	L3	8/21/2023 5:38:02 PM	Valley	13C8-PFOA	Valley
LZ86	L4	8/21/2023 5:54:06 PM	Valley	13C8-PFOA	Valley
LZ87	L5	8/21/2023 6:10:10 PM	Valley	13C8-PFOA	Valley
LZ88	L6	8/21/2023 6:26:12 PM	Baseline	13C8-PFOA	Baseline
LZ89	L7	8/21/2023 6:42:16 PM	Valley	13C8-PFOA	Valley
LZ90	L8	8/21/2023 6:58:19 PM	Valley	13C8-PFOA	Valley
LZ91 IB	Instrument Blank	8/21/2023 7:14:23 PM	Valley	13C8-PFOA	Baseline
LZ92 ICC	ICC	8/21/2023 7:30:28 PM	Valley	13C8-PFOA	Valley
LZ86 CCV	CCV	8/21/2023 10:27:16 PM	Baseline	13C8-PFOA	Baseline
DO701PB-FS(0)	Procedural Blank	8/21/2023 10:43:21 PM	N/A	13C8-PFOA	Valley
DO702LCS-FS(0)	Laboratory Control Sample	8/21/2023 10:59:25 PM	Valley	13C8-PFOA	Baseline
D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/2023 11:15:29 PM	N/A	13C8-PFOA	Valley
D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/2023 11:31:33 PM	N/A	13C8-PFOA	Valley
LZ87 CCV	CCV	8/22/2023 12:03:44 AM	Baseline	13C8-PFOA	Valley

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Manual Integration Report

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Analyte: ADONA_2 (376.9 / 84.8)

Data File	AD_08212023_5-369.wiff	**Result Table**	23-1034
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/21/2023 5:05:55 PM	Baseline	13C8-PFOA	Valley
LZ84	L2	8/21/2023 5:21:58 PM	Baseline	13C8-PFOA	Valley
LZ85	L3	8/21/2023 5:38:02 PM	Valley	13C8-PFOA	Valley
LZ86	L4	8/21/2023 5:54:06 PM	Valley	13C8-PFOA	Valley
LZ87	L5	8/21/2023 6:10:10 PM	Valley	13C8-PFOA	Valley
LZ88	L6	8/21/2023 6:26:12 PM	Valley	13C8-PFOA	Baseline
LZ89	L7	8/21/2023 6:42:16 PM	Valley	13C8-PFOA	Valley
LZ90	L8	8/21/2023 6:58:19 PM	Valley	13C8-PFOA	Valley
LZ91 IB	Instrument Blank	8/21/2023 7:14:23 PM	Valley	13C8-PFOA	Baseline
LZ92 ICC	ICC	8/21/2023 7:30:28 PM	Valley	13C8-PFOA	Valley
LZ86 CCV	CCV	8/21/2023 10:27:16 PM	Baseline	13C8-PFOA	Baseline
DO701PB-FS(0)	Procedural Blank	8/21/2023 10:43:21 PM	N/A	13C8-PFOA	Valley
DO702LCS-FS(0)	Laboratory Control Sample	8/21/2023 10:59:25 PM	Valley	13C8-PFOA	Baseline
D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/2023 11:15:29 PM	N/A	13C8-PFOA	Valley
D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/2023 11:31:33 PM	N/A	13C8-PFOA	Valley
LZ87 CCV	CCV	8/22/2023 12:03:44 AM	Valley	13C8-PFOA	Valley

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Manual Integration Report

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Analyte: 9Cl-PF3ONS_1 (530.8 / 351.0)

Data File	AD_08212023_5-369.wiff	**Result Table**	23-1034
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/21/2023 5:05:55 PM	Valley	13C8-PFOA	Valley
LZ84	L2	8/21/2023 5:21:58 PM	Valley	13C8-PFOA	Valley
LZ85	L3	8/21/2023 5:38:02 PM	Valley	13C8-PFOA	Valley
LZ86	L4	8/21/2023 5:54:06 PM	Valley	13C8-PFOA	Valley
LZ87	L5	8/21/2023 6:10:10 PM	Valley	13C8-PFOA	Valley
LZ88	L6	8/21/2023 6:26:12 PM	Valley	13C8-PFOA	Baseline
LZ89	L7	8/21/2023 6:42:16 PM	Valley	13C8-PFOA	Valley
LZ90	L8	8/21/2023 6:58:19 PM	Valley	13C8-PFOA	Valley
LZ91 IB	Instrument Blank	8/21/2023 7:14:23 PM	Valley	13C8-PFOA	Baseline
LZ92 ICC	ICC	8/21/2023 7:30:28 PM	Baseline	13C8-PFOA	Valley
LZ86 CCV	CCV	8/21/2023 10:27:16 PM	Valley	13C8-PFOA	Baseline
DO701PB-FS(0)	Procedural Blank	8/21/2023 10:43:21 PM	N/A	13C8-PFOA	Valley
DO702LCS-FS(0)	Laboratory Control Sample	8/21/2023 10:59:25 PM	Valley	13C8-PFOA	Baseline
D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/2023 11:15:29 PM	N/A	13C8-PFOA	Valley
D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/2023 11:31:33 PM	N/A	13C8-PFOA	Valley
LZ87 CCV	CCV	8/22/2023 12:03:44 AM	Valley	13C8-PFOA	Valley

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Manual Integration Report

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Analyte: 9Cl-PF3ONS_2 (532.8 / 353.0)

Data File	AD_08212023_5-369.wiff	**Result Table**	23-1034
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/21/2023 5:05:55 PM	Baseline	13C8-PFOA	Valley
LZ84	L2	8/21/2023 5:21:58 PM	Valley	13C8-PFOA	Valley
LZ85	L3	8/21/2023 5:38:02 PM	Valley	13C8-PFOA	Valley
LZ86	L4	8/21/2023 5:54:06 PM	Valley	13C8-PFOA	Valley
LZ87	L5	8/21/2023 6:10:10 PM	Baseline	13C8-PFOA	Valley
LZ88	L6	8/21/2023 6:26:12 PM	Valley	13C8-PFOA	Baseline
LZ89	L7	8/21/2023 6:42:16 PM	Valley	13C8-PFOA	Valley
LZ90	L8	8/21/2023 6:58:19 PM	Valley	13C8-PFOA	Valley
LZ91 IB	Instrument Blank	8/21/2023 7:14:23 PM	N/A	13C8-PFOA	Baseline
LZ92 ICC	ICC	8/21/2023 7:30:28 PM	Valley	13C8-PFOA	Valley
LZ86 CCV	CCV	8/21/2023 10:27:16 PM	Valley	13C8-PFOA	Baseline
DO701PB-FS(0)	Procedural Blank	8/21/2023 10:43:21 PM	N/A	13C8-PFOA	Valley
DO702LCS-FS(0)	Laboratory Control Sample	8/21/2023 10:59:25 PM	Baseline	13C8-PFOA	Baseline
D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/2023 11:15:29 PM	N/A	13C8-PFOA	Valley
D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/2023 11:31:33 PM	N/A	13C8-PFOA	Valley
LZ87 CCV	CCV	8/22/2023 12:03:44 AM	Valley	13C8-PFOA	Valley

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Analyte: 11Cl-PF3OUdS_1 (630.9 / 450.9)

Data File	AD_08212023_5-369.wiff	**Result Table**	23-1034
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/21/2023 5:05:55 PM	Baseline	13C8-PFOA	Valley
LZ84	L2	8/21/2023 5:21:58 PM	Valley	13C8-PFOA	Valley
LZ85	L3	8/21/2023 5:38:02 PM	Valley	13C8-PFOA	Valley
LZ86	L4	8/21/2023 5:54:06 PM	Baseline	13C8-PFOA	Valley
LZ87	L5	8/21/2023 6:10:10 PM	Valley	13C8-PFOA	Valley
LZ88	L6	8/21/2023 6:26:12 PM	Valley	13C8-PFOA	Baseline
LZ89	L7	8/21/2023 6:42:16 PM	Valley	13C8-PFOA	Valley
LZ90	L8	8/21/2023 6:58:19 PM	Valley	13C8-PFOA	Valley
LZ91 IB	Instrument Blank	8/21/2023 7:14:23 PM	Valley	13C8-PFOA	Baseline
LZ92 ICC	ICC	8/21/2023 7:30:28 PM	Valley	13C8-PFOA	Valley
LZ86 CCV	CCV	8/21/2023 10:27:16 PM	Valley	13C8-PFOA	Baseline
DO701PB-FS(0)	Procedural Blank	8/21/2023 10:43:21 PM	N/A	13C8-PFOA	Valley
DO702LCS-FS(0)	Laboratory Control Sample	8/21/2023 10:59:25 PM	Valley	13C8-PFOA	Baseline
D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/2023 11:15:29 PM	N/A	13C8-PFOA	Valley
D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/2023 11:31:33 PM	Valley	13C8-PFOA	Valley
LZ87 CCV	CCV	8/22/2023 12:03:44 AM	Baseline	13C8-PFOA	Valley

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Manual Integration Report

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Analyte: 11Cl-PF3OUdS_2 (632.9 / 452.9)

Data File	AD_08212023_5-369.wiff	**Result Table**	23-1034
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/21/2023 5:05:55 PM	Baseline	13C8-PFOA	Valley
LZ84	L2	8/21/2023 5:21:58 PM	Baseline	13C8-PFOA	Valley
LZ85	L3	8/21/2023 5:38:02 PM	Valley	13C8-PFOA	Valley
LZ86	L4	8/21/2023 5:54:06 PM	Valley	13C8-PFOA	Valley
LZ87	L5	8/21/2023 6:10:10 PM	Valley	13C8-PFOA	Valley
LZ88	L6	8/21/2023 6:26:12 PM	Valley	13C8-PFOA	Baseline
LZ89	L7	8/21/2023 6:42:16 PM	Valley	13C8-PFOA	Valley
LZ90	L8	8/21/2023 6:58:19 PM	Valley	13C8-PFOA	Valley
LZ91 IB	Instrument Blank	8/21/2023 7:14:23 PM	Valley	13C8-PFOA	Baseline
LZ92 ICC	ICC	8/21/2023 7:30:28 PM	Valley	13C8-PFOA	Valley
LZ86 CCV	CCV	8/21/2023 10:27:16 PM	Valley	13C8-PFOA	Baseline
DO701PB-FS(0)	Procedural Blank	8/21/2023 10:43:21 PM	N/A	13C8-PFOA	Valley
DO702LCS-FS(0)	Laboratory Control Sample	8/21/2023 10:59:25 PM	Valley	13C8-PFOA	Baseline
D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/2023 11:15:29 PM	N/A	13C8-PFOA	Valley
D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/2023 11:31:33 PM	Valley	13C8-PFOA	Valley
LZ87 CCV	CCV	8/22/2023 12:03:44 AM	Baseline	13C8-PFOA	Valley

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Analyte: 13C5-PFHxA (318.0 / 273.0)

Data File	AD_08212023_5-369.wiff	**Result Table**	23-1034_SIS
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/21/2023 5:05:55 PM	Valley	13C2-PFOA	Valley
LZ84	L2	8/21/2023 5:21:58 PM	Valley	13C2-PFOA	Valley
LZ85	L3	8/21/2023 5:38:02 PM	Valley	13C2-PFOA	Valley
LZ86	L4	8/21/2023 5:54:06 PM	Valley	13C2-PFOA	Valley
LZ87	L5	8/21/2023 6:10:10 PM	Valley	13C2-PFOA	Valley
LZ88	L6	8/21/2023 6:26:12 PM	Valley	13C2-PFOA	Valley
LZ89	L7	8/21/2023 6:42:16 PM	Valley	13C2-PFOA	Valley
LZ90	L8	8/21/2023 6:58:19 PM	Valley	13C2-PFOA	Baseline
LZ91 IB	Instrument Blank	8/21/2023 7:14:23 PM	Valley	13C2-PFOA	Valley
LZ92 ICC	ICC	8/21/2023 7:30:28 PM	Valley	13C2-PFOA	Baseline
LZ86 CCV	CCV	8/21/2023 10:27:16 PM	Valley	13C2-PFOA	Valley
DO701PB-FS(0)	Procedural Blank	8/21/2023 10:43:21 PM	Valley	13C2-PFOA	Baseline
DO702LCS-FS(0)	Laboratory Control Sample	8/21/2023 10:59:25 PM	Baseline	13C2-PFOA	Baseline
D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/2023 11:15:29 PM	Valley	13C2-PFOA	Valley
D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/2023 11:31:33 PM	Valley	13C2-PFOA	Valley
LZ87 CCV	CCV	8/22/2023 12:03:44 AM	Valley	13C2-PFOA	Baseline

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Manual Integration Report

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Analyte: 13C4-PFHpA (367.1 / 322.0)

Data File	AD_08212023_5-369.wiff	**Result Table**	23-1034_SIS
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/21/2023 5:05:55 PM	Valley	13C2-PFOA	Valley
LZ84	L2	8/21/2023 5:21:58 PM	Valley	13C2-PFOA	Valley
LZ85	L3	8/21/2023 5:38:02 PM	Valley	13C2-PFOA	Valley
LZ86	L4	8/21/2023 5:54:06 PM	Valley	13C2-PFOA	Valley
LZ87	L5	8/21/2023 6:10:10 PM	Valley	13C2-PFOA	Valley
LZ88	L6	8/21/2023 6:26:12 PM	Valley	13C2-PFOA	Valley
LZ89	L7	8/21/2023 6:42:16 PM	Valley	13C2-PFOA	Valley
LZ90	L8	8/21/2023 6:58:19 PM	Valley	13C2-PFOA	Baseline
LZ91 IB	Instrument Blank	8/21/2023 7:14:23 PM	Baseline	13C2-PFOA	Valley
LZ92 ICC	ICC	8/21/2023 7:30:28 PM	Baseline	13C2-PFOA	Baseline
LZ86 CCV	CCV	8/21/2023 10:27:16 PM	Baseline	13C2-PFOA	Valley
DO701PB-FS(0)	Procedural Blank	8/21/2023 10:43:21 PM	Valley	13C2-PFOA	Baseline
DO702LCS-FS(0)	Laboratory Control Sample	8/21/2023 10:59:25 PM	Valley	13C2-PFOA	Baseline
D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/2023 11:15:29 PM	Baseline	13C2-PFOA	Valley
D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/2023 11:31:33 PM	Valley	13C2-PFOA	Valley
LZ87 CCV	CCV	8/22/2023 12:03:44 AM	Valley	13C2-PFOA	Baseline

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Manual Integration Report

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Analyte: 13C8-PFOA (421.1 / 376.0)

Data File	AD_08212023_5-369.wiff	**Result Table**	23-1034_SIS
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/21/2023 5:05:55 PM	Valley	13C2-PFOA	Valley
LZ84	L2	8/21/2023 5:21:58 PM	Valley	13C2-PFOA	Valley
LZ85	L3	8/21/2023 5:38:02 PM	Valley	13C2-PFOA	Valley
LZ86	L4	8/21/2023 5:54:06 PM	Valley	13C2-PFOA	Valley
LZ87	L5	8/21/2023 6:10:10 PM	Valley	13C2-PFOA	Valley
LZ88	L6	8/21/2023 6:26:12 PM	Baseline	13C2-PFOA	Valley
LZ89	L7	8/21/2023 6:42:16 PM	Valley	13C2-PFOA	Valley
LZ90	L8	8/21/2023 6:58:19 PM	Valley	13C2-PFOA	Baseline
LZ91 IB	Instrument Blank	8/21/2023 7:14:23 PM	Baseline	13C2-PFOA	Valley
LZ92 ICC	ICC	8/21/2023 7:30:28 PM	Valley	13C2-PFOA	Baseline
LZ86 CCV	CCV	8/21/2023 10:27:16 PM	Baseline	13C2-PFOA	Valley
DO701PB-FS(0)	Procedural Blank	8/21/2023 10:43:21 PM	Valley	13C2-PFOA	Baseline
DO702LCS-FS(0)	Laboratory Control Sample	8/21/2023 10:59:25 PM	Baseline	13C2-PFOA	Baseline
D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/2023 11:15:29 PM	Valley	13C2-PFOA	Valley
D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/2023 11:31:33 PM	Valley	13C2-PFOA	Valley
LZ87 CCV	CCV	8/22/2023 12:03:44 AM	Valley	13C2-PFOA	Baseline

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Manual Integration Report

Created with Analyst Reporter
Printed: 23/08/2023 10:36:50 AM

Analyte: 13C9-PFNA (472.1 / 427.0)

Data File	AD_08212023_5-369.wiff	**Result Table**	23-1034_SIS
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/21/2023 5:05:55 PM	Baseline	13C2-PFOA	Valley
LZ84	L2	8/21/2023 5:21:58 PM	Baseline	13C2-PFOA	Valley
LZ85	L3	8/21/2023 5:38:02 PM	Baseline	13C2-PFOA	Valley
LZ86	L4	8/21/2023 5:54:06 PM	Valley	13C2-PFOA	Valley
LZ87	L5	8/21/2023 6:10:10 PM	Valley	13C2-PFOA	Valley
LZ88	L6	8/21/2023 6:26:12 PM	Baseline	13C2-PFOA	Valley
LZ89	L7	8/21/2023 6:42:16 PM	Valley	13C2-PFOA	Valley
LZ90	L8	8/21/2023 6:58:19 PM	Valley	13C2-PFOA	Baseline
LZ91 IB	Instrument Blank	8/21/2023 7:14:23 PM	Valley	13C2-PFOA	Valley
LZ92 ICC	ICC	8/21/2023 7:30:28 PM	Valley	13C2-PFOA	Baseline
LZ86 CCV	CCV	8/21/2023 10:27:16 PM	Valley	13C2-PFOA	Valley
DO701PB-FS(0)	Procedural Blank	8/21/2023 10:43:21 PM	Valley	13C2-PFOA	Baseline
DO702LCS-FS(0)	Laboratory Control Sample	8/21/2023 10:59:25 PM	Baseline	13C2-PFOA	Baseline
D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/2023 11:15:29 PM	Valley	13C2-PFOA	Valley
D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/2023 11:31:33 PM	Valley	13C2-PFOA	Valley
LZ87 CCV	CCV	8/22/2023 12:03:44 AM	Valley	13C2-PFOA	Baseline

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Analyte: 13C6-PFDA (519.1 / 474.1)

Data File	AD_08212023_5-369.wiff	**Result Table**	23-1034_SIS
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/21/2023 5:05:55 PM	Valley	13C2-PFDA	Valley
LZ84	L2	8/21/2023 5:21:58 PM	Valley	13C2-PFDA	Baseline
LZ85	L3	8/21/2023 5:38:02 PM	Valley	13C2-PFDA	Valley
LZ86	L4	8/21/2023 5:54:06 PM	Baseline	13C2-PFDA	Valley
LZ87	L5	8/21/2023 6:10:10 PM	Valley	13C2-PFDA	Valley
LZ88	L6	8/21/2023 6:26:12 PM	Valley	13C2-PFDA	Valley
LZ89	L7	8/21/2023 6:42:16 PM	Valley	13C2-PFDA	Valley
LZ90	L8	8/21/2023 6:58:19 PM	Valley	13C2-PFDA	Valley
LZ91 IB	Instrument Blank	8/21/2023 7:14:23 PM	Baseline	13C2-PFDA	Valley
LZ92 ICC	ICC	8/21/2023 7:30:28 PM	Valley	13C2-PFDA	Valley
LZ86 CCV	CCV	8/21/2023 10:27:16 PM	Valley	13C2-PFDA	Valley
DO701PB-FS(0)	Procedural Blank	8/21/2023 10:43:21 PM	Valley	13C2-PFDA	Valley
DO702LCS-FS(0)	Laboratory Control Sample	8/21/2023 10:59:25 PM	Baseline	13C2-PFDA	Valley
D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/2023 11:15:29 PM	Baseline	13C2-PFDA	Valley
D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/2023 11:31:33 PM	Baseline	13C2-PFDA	Valley
LZ87 CCV	CCV	8/22/2023 12:03:44 AM	Valley	13C2-PFDA	Valley

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Analyte: 13C7-PFUnA (570.0 / 525.1)

Data File	AD_08212023_5-369.wiff	**Result Table**	23-1034_SIS
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/21/2023 5:05:55 PM	Valley	13C2-PFDA	Valley
LZ84	L2	8/21/2023 5:21:58 PM	Valley	13C2-PFDA	Baseline
LZ85	L3	8/21/2023 5:38:02 PM	Valley	13C2-PFDA	Valley
LZ86	L4	8/21/2023 5:54:06 PM	Valley	13C2-PFDA	Valley
LZ87	L5	8/21/2023 6:10:10 PM	Valley	13C2-PFDA	Valley
LZ88	L6	8/21/2023 6:26:12 PM	Baseline	13C2-PFDA	Valley
LZ89	L7	8/21/2023 6:42:16 PM	Valley	13C2-PFDA	Valley
LZ90	L8	8/21/2023 6:58:19 PM	Baseline	13C2-PFDA	Valley
LZ91 IB	Instrument Blank	8/21/2023 7:14:23 PM	Valley	13C2-PFDA	Valley
LZ92 ICC	ICC	8/21/2023 7:30:28 PM	Baseline	13C2-PFDA	Valley
LZ86 CCV	CCV	8/21/2023 10:27:16 PM	Valley	13C2-PFDA	Valley
DO701PB-FS(0)	Procedural Blank	8/21/2023 10:43:21 PM	Baseline	13C2-PFDA	Valley
DO702LCS-FS(0)	Laboratory Control Sample	8/21/2023 10:59:25 PM	Valley	13C2-PFDA	Valley
D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/2023 11:15:29 PM	Valley	13C2-PFDA	Valley
D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/2023 11:31:33 PM	Valley	13C2-PFDA	Valley
LZ87 CCV	CCV	8/22/2023 12:03:44 AM	Valley	13C2-PFDA	Valley

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Analyte: 13C2-PFDoA (615.1 / 570.0)

Data File	AD_08212023_5-369.wiff	**Result Table**	23-1034_SIS
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/21/2023 5:05:55 PM	Valley	13C2-PFDA	Valley
LZ84	L2	8/21/2023 5:21:58 PM	Valley	13C2-PFDA	Baseline
LZ85	L3	8/21/2023 5:38:02 PM	Valley	13C2-PFDA	Valley
LZ86	L4	8/21/2023 5:54:06 PM	Valley	13C2-PFDA	Valley
LZ87	L5	8/21/2023 6:10:10 PM	Valley	13C2-PFDA	Valley
LZ88	L6	8/21/2023 6:26:12 PM	Valley	13C2-PFDA	Valley
LZ89	L7	8/21/2023 6:42:16 PM	Valley	13C2-PFDA	Valley
LZ90	L8	8/21/2023 6:58:19 PM	Valley	13C2-PFDA	Valley
LZ91 IB	Instrument Blank	8/21/2023 7:14:23 PM	Baseline	13C2-PFDA	Valley
LZ92 ICC	ICC	8/21/2023 7:30:28 PM	Valley	13C2-PFDA	Valley
LZ86 CCV	CCV	8/21/2023 10:27:16 PM	Valley	13C2-PFDA	Valley
DO701PB-FS(0)	Procedural Blank	8/21/2023 10:43:21 PM	Valley	13C2-PFDA	Valley
DO702LCS-FS(0)	Laboratory Control Sample	8/21/2023 10:59:25 PM	Valley	13C2-PFDA	Valley
D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/2023 11:15:29 PM	Valley	13C2-PFDA	Valley
D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/2023 11:31:33 PM	Valley	13C2-PFDA	Valley
LZ87 CCV	CCV	8/22/2023 12:03:44 AM	Valley	13C2-PFDA	Valley

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Analyte: 13C2-PFTeDA (715.2 / 670.0)

Data File	AD_08212023_5-369.wiff	**Result Table**	23-1034_SIS
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/21/2023 5:05:55 PM	Valley	13C2-PFDA	Valley
LZ84	L2	8/21/2023 5:21:58 PM	Valley	13C2-PFDA	Baseline
LZ85	L3	8/21/2023 5:38:02 PM	Valley	13C2-PFDA	Valley
LZ86	L4	8/21/2023 5:54:06 PM	Valley	13C2-PFDA	Valley
LZ87	L5	8/21/2023 6:10:10 PM	Valley	13C2-PFDA	Valley
LZ88	L6	8/21/2023 6:26:12 PM	Valley	13C2-PFDA	Valley
LZ89	L7	8/21/2023 6:42:16 PM	Valley	13C2-PFDA	Valley
LZ90	L8	8/21/2023 6:58:19 PM	Valley	13C2-PFDA	Valley
LZ91 IB	Instrument Blank	8/21/2023 7:14:23 PM	Valley	13C2-PFDA	Valley
LZ92 ICC	ICC	8/21/2023 7:30:28 PM	Valley	13C2-PFDA	Valley
LZ86 CCV	CCV	8/21/2023 10:27:16 PM	Valley	13C2-PFDA	Valley
DO701PB-FS(0)	Procedural Blank	8/21/2023 10:43:21 PM	Valley	13C2-PFDA	Valley
DO702LCS-FS(0)	Laboratory Control Sample	8/21/2023 10:59:25 PM	Valley	13C2-PFDA	Valley
D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/2023 11:15:29 PM	Valley	13C2-PFDA	Valley
D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/2023 11:31:33 PM	Valley	13C2-PFDA	Valley
LZ87 CCV	CCV	8/22/2023 12:03:44 AM	Valley	13C2-PFDA	Valley

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Analyte: 13C3-PFBS (302.1 / 79.9)

Data File	AD_08212023_5-369.wiff	**Result Table**	23-1034_SIS
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/21/2023 5:05:55 PM	Valley	13C4-PFOS	Baseline
LZ84	L2	8/21/2023 5:21:58 PM	Baseline	13C4-PFOS	Valley
LZ85	L3	8/21/2023 5:38:02 PM	Baseline	13C4-PFOS	Valley
LZ86	L4	8/21/2023 5:54:06 PM	Valley	13C4-PFOS	Valley
LZ87	L5	8/21/2023 6:10:10 PM	Valley	13C4-PFOS	Baseline
LZ88	L6	8/21/2023 6:26:12 PM	Valley	13C4-PFOS	Valley
LZ89	L7	8/21/2023 6:42:16 PM	Valley	13C4-PFOS	Baseline
LZ90	L8	8/21/2023 6:58:19 PM	Valley	13C4-PFOS	Valley
LZ91 IB	Instrument Blank	8/21/2023 7:14:23 PM	Valley	13C4-PFOS	Baseline
LZ92 ICC	ICC	8/21/2023 7:30:28 PM	Baseline	13C4-PFOS	Valley
LZ86 CCV	CCV	8/21/2023 10:27:16 PM	Baseline	13C4-PFOS	Valley
DO701PB-FS(0)	Procedural Blank	8/21/2023 10:43:21 PM	Valley	13C4-PFOS	Valley
DO702LCS-FS(0)	Laboratory Control Sample	8/21/2023 10:59:25 PM	Baseline	13C4-PFOS	Valley
D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/2023 11:15:29 PM	Valley	13C4-PFOS	Valley
D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/2023 11:31:33 PM	Baseline	13C4-PFOS	Valley
LZ87 CCV	CCV	8/22/2023 12:03:44 AM	Valley	13C4-PFOS	Valley

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Analyte: 13C3-PFHxS (402.1 / 79.9)

Data File	AD_08212023_5-369.wiff	**Result Table**	23-1034_SIS
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/21/2023 5:05:55 PM	Baseline	13C4-PFOS	Baseline
LZ84	L2	8/21/2023 5:21:58 PM	Valley	13C4-PFOS	Valley
LZ85	L3	8/21/2023 5:38:02 PM	Valley	13C4-PFOS	Valley
LZ86	L4	8/21/2023 5:54:06 PM	Valley	13C4-PFOS	Valley
LZ87	L5	8/21/2023 6:10:10 PM	Valley	13C4-PFOS	Baseline
LZ88	L6	8/21/2023 6:26:12 PM	Valley	13C4-PFOS	Valley
LZ89	L7	8/21/2023 6:42:16 PM	Valley	13C4-PFOS	Baseline
LZ90	L8	8/21/2023 6:58:19 PM	Baseline	13C4-PFOS	Valley
LZ91 IB	Instrument Blank	8/21/2023 7:14:23 PM	Baseline	13C4-PFOS	Baseline
LZ92 ICC	ICC	8/21/2023 7:30:28 PM	Baseline	13C4-PFOS	Valley
LZ86 CCV	CCV	8/21/2023 10:27:16 PM	Baseline	13C4-PFOS	Valley
DO701PB-FS(0)	Procedural Blank	8/21/2023 10:43:21 PM	Valley	13C4-PFOS	Valley
DO702LCS-FS(0)	Laboratory Control Sample	8/21/2023 10:59:25 PM	Valley	13C4-PFOS	Valley
D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/2023 11:15:29 PM	Valley	13C4-PFOS	Valley
D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/2023 11:31:33 PM	Valley	13C4-PFOS	Valley
LZ87 CCV	CCV	8/22/2023 12:03:44 AM	Valley	13C4-PFOS	Valley

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Analyte: 13C8-PFOS (507.1 / 79.9)

Data File	AD_08212023_5-369.wiff	**Result Table**	23-1034_SIS
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/21/2023 5:05:55 PM	Valley	13C4-PFOS	Baseline
LZ84	L2	8/21/2023 5:21:58 PM	Valley	13C4-PFOS	Valley
LZ85	L3	8/21/2023 5:38:02 PM	Valley	13C4-PFOS	Valley
LZ86	L4	8/21/2023 5:54:06 PM	Valley	13C4-PFOS	Valley
LZ87	L5	8/21/2023 6:10:10 PM	Valley	13C4-PFOS	Baseline
LZ88	L6	8/21/2023 6:26:12 PM	Valley	13C4-PFOS	Valley
LZ89	L7	8/21/2023 6:42:16 PM	Valley	13C4-PFOS	Baseline
LZ90	L8	8/21/2023 6:58:19 PM	Valley	13C4-PFOS	Valley
LZ91 IB	Instrument Blank	8/21/2023 7:14:23 PM	Valley	13C4-PFOS	Baseline
LZ92 ICC	ICC	8/21/2023 7:30:28 PM	Valley	13C4-PFOS	Valley
LZ86 CCV	CCV	8/21/2023 10:27:16 PM	Baseline	13C4-PFOS	Valley
DO701PB-FS(0)	Procedural Blank	8/21/2023 10:43:21 PM	Valley	13C4-PFOS	Valley
DO702LCS-FS(0)	Laboratory Control Sample	8/21/2023 10:59:25 PM	Valley	13C4-PFOS	Valley
D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/2023 11:15:29 PM	Valley	13C4-PFOS	Valley
D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/2023 11:31:33 PM	Valley	13C4-PFOS	Valley
LZ87 CCV	CCV	8/22/2023 12:03:44 AM	Valley	13C4-PFOS	Valley

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Analyte: d3-MeFOSAA (573.2 / 419.0)

Data File	AD_08212023_5-369.wiff	**Result Table**	23-1034_SIS
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/21/2023 5:05:55 PM	Baseline	13C2-PFOA	Valley
LZ84	L2	8/21/2023 5:21:58 PM	Baseline	13C2-PFOA	Valley
LZ85	L3	8/21/2023 5:38:02 PM	Valley	13C2-PFOA	Valley
LZ86	L4	8/21/2023 5:54:06 PM	Valley	13C2-PFOA	Valley
LZ87	L5	8/21/2023 6:10:10 PM	Valley	13C2-PFOA	Valley
LZ88	L6	8/21/2023 6:26:12 PM	Valley	13C2-PFOA	Valley
LZ89	L7	8/21/2023 6:42:16 PM	Baseline	13C2-PFOA	Valley
LZ90	L8	8/21/2023 6:58:19 PM	Baseline	13C2-PFOA	Baseline
LZ91 IB	Instrument Blank	8/21/2023 7:14:23 PM	Valley	13C2-PFOA	Valley
LZ92 ICC	ICC	8/21/2023 7:30:28 PM	Valley	13C2-PFOA	Baseline
LZ86 CCV	CCV	8/21/2023 10:27:16 PM	Baseline	13C2-PFOA	Valley
DO701PB-FS(0)	Procedural Blank	8/21/2023 10:43:21 PM	Valley	13C2-PFOA	Baseline
DO702LCS-FS(0)	Laboratory Control Sample	8/21/2023 10:59:25 PM	Valley	13C2-PFOA	Baseline
D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/2023 11:15:29 PM	Baseline	13C2-PFOA	Valley
D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/2023 11:31:33 PM	Valley	13C2-PFOA	Valley
LZ87 CCV	CCV	8/22/2023 12:03:44 AM	Baseline	13C2-PFOA	Baseline

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Manual Integration Report

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Printed: 23/08/2023 10:36:50 AM

Analyte: d5-EtFOSAA (589.2 / 419.0)

Data File	AD_08212023_5-369.wiff	**Result Table**	23-1034_SIS
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/21/2023 5:05:55 PM	Valley	13C2-PFOA	Valley
LZ84	L2	8/21/2023 5:21:58 PM	Valley	13C2-PFOA	Valley
LZ85	L3	8/21/2023 5:38:02 PM	Valley	13C2-PFOA	Valley
LZ86	L4	8/21/2023 5:54:06 PM	Baseline	13C2-PFOA	Valley
LZ87	L5	8/21/2023 6:10:10 PM	Valley	13C2-PFOA	Valley
LZ88	L6	8/21/2023 6:26:12 PM	Valley	13C2-PFOA	Valley
LZ89	L7	8/21/2023 6:42:16 PM	Valley	13C2-PFOA	Valley
LZ90	L8	8/21/2023 6:58:19 PM	Valley	13C2-PFOA	Baseline
LZ91 IB	Instrument Blank	8/21/2023 7:14:23 PM	Baseline	13C2-PFOA	Valley
LZ92 ICC	ICC	8/21/2023 7:30:28 PM	Baseline	13C2-PFOA	Baseline
LZ86 CCV	CCV	8/21/2023 10:27:16 PM	Valley	13C2-PFOA	Valley
DO701PB-FS(0)	Procedural Blank	8/21/2023 10:43:21 PM	Valley	13C2-PFOA	Baseline
DO702LCS-FS(0)	Laboratory Control Sample	8/21/2023 10:59:25 PM	Valley	13C2-PFOA	Baseline
D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/2023 11:15:29 PM	Baseline	13C2-PFOA	Valley
D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/2023 11:31:33 PM	Baseline	13C2-PFOA	Valley
LZ87 CCV	CCV	8/22/2023 12:03:44 AM	Valley	13C2-PFOA	Baseline

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Analyte: 13C3-HFPO-DA (286.9 / 168.9)

Data File	AD_08212023_5-369.wiff	**Result Table**	23-1034_SIS
Acquisition Method	5-369_ACN.dam	**Instrument Name**	QTRAP 6500 Low Mass

Samples:

Sample Name	Sample ID	Acquisition Date	Integration Type	Internal Standard	Integration Type
LZ83	L1	8/21/2023 5:05:55 PM	Valley	13C2-PFOA	Valley
LZ84	L2	8/21/2023 5:21:58 PM	Valley	13C2-PFOA	Valley
LZ85	L3	8/21/2023 5:38:02 PM	Valley	13C2-PFOA	Valley
LZ86	L4	8/21/2023 5:54:06 PM	Valley	13C2-PFOA	Valley
LZ87	L5	8/21/2023 6:10:10 PM	Valley	13C2-PFOA	Valley
LZ88	L6	8/21/2023 6:26:12 PM	Baseline	13C2-PFOA	Valley
LZ89	L7	8/21/2023 6:42:16 PM	Baseline	13C2-PFOA	Valley
LZ90	L8	8/21/2023 6:58:19 PM	Valley	13C2-PFOA	Baseline
LZ91 IB	Instrument Blank	8/21/2023 7:14:23 PM	Valley	13C2-PFOA	Valley
LZ92 ICC	ICC	8/21/2023 7:30:28 PM	Baseline	13C2-PFOA	Baseline
LZ86 CCV	CCV	8/21/2023 10:27:16 PM	Valley	13C2-PFOA	Valley
DO701PB-FS(0)	Procedural Blank	8/21/2023 10:43:21 PM	Valley	13C2-PFOA	Baseline
DO702LCS-FS(0)	Laboratory Control Sample	8/21/2023 10:59:25 PM	Valley	13C2-PFOA	Baseline
D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/2023 11:15:29 PM	Valley	13C2-PFOA	Valley
D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/2023 11:31:33 PM	Valley	13C2-PFOA	Valley
LZ87 CCV	CCV	8/22/2023 12:03:44 AM	Baseline	13C2-PFOA	Baseline

Example Calculation for PFAS

Calculation of final concentration from area:

$$Concentration = \left[\frac{PA - b}{m}\right] * C_{IS} * DF/S$$

Where:

PA = Area of target / area of internal standard
b = y intercept from calibration curve
CIS = concentration of internal standard (ng)
m = slope of calibration
DF = dilution factor
S = Sample Size

Sample ID:	DO702LCS-FS
Client Sample ID:	Laboratory Control Sample
Sample Size:	0.254
Units:	L
Dilution Factor:	1.000
Target Analyte:	PFHxA_1
MRM Transition:	313.0 / 269.0
Data file:	AD_08212023_5-369.wiff
Result table:	23-1034
Area:	3,262,365.34
IS Name:	13C5-PFHxA
IS Area:	1,668,418.19
IS Amount (ng):	25
y-intercept:	-0.01097
slope:	1.26812

$$\text{Concentration} = \frac{[(3262365.34/1668418.19) - -0.01097]}{1.26812} * 25 * 1 / 0.254$$

ng/L = 153

Concentration may vary based on rounding.

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It can be done

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001
Preparation Batch: 23-1034
Data Set: DP-23-1138

		DO701PB-FS (Procedural Blank)	DO702LCS-FS (Laboratory Control Sample)	D7902-FS (NBKK-B76-IDW01-AQ-081623)	D7903-FS (NBKK-B76-IDW02-AQ-081623)
PFHxA	307-24-4	-	L	L	L
PFHpA	375-85-9	-	L	L	L
PFOA	335-67-1	-	L	L	L
PFNA	375-95-1	-	L	-	L
PFDA	335-76-2	-	L	-	-
PFUnA	2058-94-8	-	L	-	-
PFDoA	307-55-1	-	L	-	-
PFTrDA	72629-94-8	-	L	-	-
PFTeDA	376-06-7	-	L	-	-
NMeFOSAA	2355-31-9	-	L/Br	-	-
NEtFOSAA	2991-50-6	-	L/Br	-	-
PFBS	375-73-5	-	L	-	L
PFHxS	355-46-4	-	L/Br	L/Br	L/Br
PFOS	1763-23-1	-	L/Br	L/Br	L/Br
HFPO-DA	13252-13-6	-	L	-	-
Adona	919005-14-4	-	L	-	-
9Cl-PF3ONS	756426-58-1	-	L	-	-
11Cl-PF3OUdS	763051-92-9	-	L	-	-

"L" :Linear
"Br": branched
"L/Br": Linear/Branched
"-": Not detected

Project Client: CH2M
Project Name: CTO-4117: Northwest PFAS Investigation
Project No.: G25161.X1.XX.0026.000001

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It can be done

			Passing criteria = 50% to 150% of internal standard area (compared to mid-point of calibration)							
Sample Name	Sample ID	Analysis Date	13C3-PFBA		13C2-PFOA		13C2-PFDA		13C4-PFOS	
LZ87	L5	8/21/23 18:10	-		2,241,667.95		1,099,034.13		84,728.68	
		Lower	-		1,120,833.98		549,517.07		42,364.34	
		Upper	-		3,362,501.93		1,648,551.20		127,093.02	

Sample Name	Sample ID	Analysis Date	13C3-PFBA	Qual	User	13C2-PFOA	Qual	User	13C2-PFDA	Qual	User	13C4-PFOS	Qual	User
LZ83	L1	8/21/23 17:05	-			2,023,351.05			1,070,839.34			80,300.45		
LZ84	L2	8/21/23 17:21	-			2,319,965.77			1,164,963.57			84,453.10		
LZ85	L3	8/21/23 17:38	-			2,026,114.10			992,095.88			75,010.32		
LZ86	L4	8/21/23 17:54	-			2,020,918.88			1,052,078.09			78,843.00		
LZ87	L5	8/21/23 18:10	-			2,241,667.95			1,099,034.13			84,728.68		
LZ88	L6	8/21/23 18:26	-			1,896,299.30			939,182.08			67,112.30		
LZ89	L7	8/21/23 18:42	-			1,912,415.79			944,778.46			62,809.45		
LZ90	L8	8/21/23 18:58	-			1,471,846.80			716,276.86			46,127.98		
LZ91 IB	Instrument Blank	8/21/23 19:14	-			1,785,806.39			976,831.89			70,864.06		
LZ92 ICC	ICC	8/21/23 19:30	-			1,963,494.82			897,794.24			65,954.30		
LZ86 CCV	CCV	8/21/23 22:27	-			1,889,197.75			1,091,955.25			74,759.26		
DO701PB-FS(0)	Procedural Blank	8/21/23 22:43	-			2,054,424.23			1,014,620.45			80,882.64		
DO702LCS-FS(0)	Laboratory Control Sample	8/21/23 22:59	-			1,935,715.24			1,004,345.95			71,396.09		
D7902-FS(0)	NBKK-B76-IDW01-AQ-081623	8/21/23 23:15	-			1,026,542.52	N	1	65,272.67	N	1	9,181.33	N	1
D7903-FS(0)	NBKK-B76-IDW02-AQ-081623	8/21/23 23:31	-			1,302,652.86			1,428,968.87			62,544.61		
LZ87 CCV	CCV	8/22/23 0:03	-			1,791,587.40			1,081,631.81			75,582.33		

1 - Outside of acceptance criteria. No corrective action required. VU 23AUG2023

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Summary Asymmetry Report

Created with Analyst Reporter
Printed: 23/08/2023 10:24:29 AM

Sample Name	LZ87	**Injection Vial**	7
Sample ID	L5	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 6:10:10 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Asymmetry Factor	Passing Range
PFHxA_1	313.0 / 269.0	6.21	1.02	0.8 – 1.5
PFBS_1	298.7 / 79.9	6.11	1.08	0.8 – 1.5

Sample Name	LZ88	**Injection Vial**	8
Sample ID	L6	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 6:26:12 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Spectra Acquisition Rate	Passing Range
PFHxA_1	313.0 / 269.0	6.22	48	>10
PFHxA_2	313.0 / 118.9	6.22	45	>10
PFHpA_1	363.1 / 319.0	6.94	59	>10
PFHpA_2	363.1 / 169.0	6.94	30	>10
PFOA_1	413.0 / 369.0	7.49	48	>10
PFOA_2	413.0 / 169.0	7.49	45	>10
PFNA_1	463.0 / 419.0	7.97	42	>10
PFNA_2	463.0 / 219.0	7.97	47	>10
PFDA_1	512.9 / 469.0	8.39	50	>10
PFDA_2	512.9 / 219.0	8.39	57	>10
PFUnA_1	563.1 / 519.0	8.80	65	>10
PFUnA_2	563.1 / 269.1	8.80	46	>10
PFDoA_1	613.1 / 569.0	9.21	51	>10
PFDoA_2	613.1 / 319.0	9.21	50	>10
PFTrDA_1	663.0 / 619.0	9.60	52	>10
PFTrDA_2	663.0 / 168.9	9.60	44	>10
PFTeDA_1	713.0 / 669.0	9.97	44	>10
PFTeDA_2	713.0 / 168.9	9.97	32	>10
PFBS_1	298.7 / 79.9	6.11	52	>10
PFBS_2	298.9 / 98.8	6.11	46	>10
PFHxS_1	399.0 / 80.0	7.57	44	>10
PFHxS_2	399.0 / 99.0	7.57	33	>10
PFOS_1	498.9 / 79.9	8.52	63	>10
PFOS_2	498.9 / 98.9	8.52	36	>10
NMeFOSAA_1	570.1 / 419.0	8.43	41	>10
NMeFOSAA_2	570.1 / 483.0	8.43	32	>10
NEtFOSAA_1	584.2 / 419.1	8.59	40	>10
NEtFOSAA_2	584.2 / 526.0	8.59	44	>10
HFPO-DA_1	284.9 / 168.9	6.47	49	>10
HFPO-DA_2	284.9 / 184.9	6.47	21	>10
ADONA_1	376.9 / 250.9	7.14	72	>10
ADONA_2	376.9 / 84.8	7.14	27	>10
9Cl-PF3ONS_1	530.8 / 351.0	8.81	41	>10
9Cl-PF3ONS_2	532.8 / 353.0	8.81	48	>10
11Cl-PF3OUdS_1	630.9 / 450.9	9.63	46	>10
11Cl-PF3OUdS_2	632.9 / 452.9	9.63	50	>10

Sample Name	LZ88	**Injection Vial**	8
Sample ID	L6	**Injection Volume**	5.00
Sample Type	Standard	**Instrument Name**	QTRAP 6500 Low Mass
Acquisition Date	8/21/2023 6:26:12 PM	**Data File**	AD_08212023_5-369.wiff
Acquisition Method	5-369_ACN.dam	**Result Table**	23-1034_SIS
Sample Comment			

Results Summary

Analyte	MRM Transition	RT	Spectra Acquisition Rate	Passing Range
13C5-PFHxA	318.0 / 273.0	6.19	59	>10
13C4-PFHpA	367.1 / 322.0	6.92	51	>10
13C8-PFOA	421.1 / 376.0	7.47	41	>10
13C9-PFNA	472.1 / 427.0	7.94	63	>10
13C6-PFDA	519.1 / 474.1	8.37	44	>10
13C7-PFUnA	570.0 / 525.1	8.78	59	>10
13C2-PFDoA	615.1 / 570.0	9.19	44	>10
13C2-PFTeDA	715.2 / 670.0	9.95	52	>10
13C3-PFBS	302.1 / 79.9	6.10	54	>10
13C3-PFHxS	402.1 / 79.9	7.55	36	>10
13C8-PFOS	507.1 / 79.9	8.51	42	>10
d3-MeFOSAA	573.2 / 419.0	8.42	26	>10
d5-EtFOSAA	589.2 / 419.0	8.58	23	>10
13C3-HFPO-DA	286.9 / 168.9	6.46	61	>10

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It can be done

Precision and Bias at the LOQ for PFAS in non-potable Water

Analyte	CAS No.	Average (ng/L)	ST DEV	2 Sigma	n [1]
PFBA	375-22-4	11.00	0.9226	1.85	14
PFPeA	2706-90-3	9.81	0.7228	1.45	11
PFHxA	307-24-4	9.88	1.1365	2.27	43
PFHpA	375-85-9	9.76	0.9225	1.85	43
PFOA	335-67-1	9.93	1.3923	2.78	44
PFNA	375-95-1	9.71	1.1236	2.25	43
PFDA	335-76-2	9.51	0.9842	1.97	43
PFUnA	2058-94-8	9.55	0.9267	1.85	43
PFDoA	307-55-1	10.22	0.9055	1.81	43
PFTrDA	72629-94-8	9.93	1.2752	2.55	43
PFTeDA	376-06-7	10.39	0.9707	1.94	43
NMeFOSAA	2355-31-9	10.02	1.5564	3.11	43
NEtFOSAA	2991-50-6	9.55	1.4218	2.84	43
PFOSA	754-91-6	10.06	0.8394	1.68	11
PFBS	375-73-5	9.63	1.1816	2.36	43
PFPeS	2706-91-4	9.88	0.9203	1.84	5
PFHxS	355-46-4	9.90	1.1346	2.27	43
PFHpS	375-92-8	10.13	1.0851	2.17	11
PFOS	1763-23-1	9.78	1.2383	2.48	44
PFNS	68259-12-1	9.45	1.0923	2.18	5
PFDS	335-77-3	9.55	1.3140	2.63	11
4:2FTS	757124-72-4	10.38	1.7353	3.47	6
6:2FTS	27619-97-2	10.08	1.1871	2.37	12
8:2FTS	39108-34-4	9.59	1.4345	2.87	12
HFPO-DA	13252-13-6	10.92	1.4420	2.88	25
Adona	919005-14-4	10.38	1.4862	2.97	25
11Cl-PF3OUdS	763051-92-9	9.80	1.5701	3.14	25
9Cl-PF3ONS	756426-58-1	9.52	1.0952	2.19	25

[1] Minimum of 20 samples required per QAM for determination of uncertainty, results including less than 20 data points are estimated.

MDL Values calculated based on 40 CFR 136 (2017)
Compliant with DoD QSM 5.3 Table B-15
Recalculated 9/16/2021
Matrix: Non-potable water (based on 250 mL sample with no dilution)
Calculated to 3 significant figures

Analyte	CAS No.	MDL (ng/L)	LOD (ng/L)	LOQ (ng/L)
NFDHA	151772-58-6	0.770	2.50	5.00
PFEESA	113507-82-7	0.695	2.50	5.00
PFMPA	377-73-1	1.09	2.50	5.00
PFMBA	863090-89-5	0.931	2.50	5.00
PFBA	375-22-4	1.51	3.50	5.00
PFPeA	2706-90-3	1.28	3.50	5.00
PFHxA	307-24-4	0.913	2.50	5.00
PFHpA	375-85-9	0.941	2.50	5.00
PFOA	335-67-1	1.01	2.50	5.00
PFNA	375-95-1	0.833	2.50	5.00
PFDA	335-76-2	0.784	2.50	5.00
PFUnA	2058-94-8	0.752	2.50	5.00
PFDoA	307-55-1	0.760	2.50	5.00
PFTrDA	72629-94-8	0.742	2.50	5.00
PFTeDA	376-06-7	0.791	2.50	5.00
PFHxDA	67905-19-5	0.762	2.50	5.00
PFODA	16517-11-6	0.942	2.50	5.00
NMeFOSAA	2355-31-9	1.03	2.50	5.00
NEtFOSAA	2991-50-6	0.990	2.50	5.00
NMeFOSA	31506-32-8	1.06	2.50	5.00
NEtFOSA	4151-50-2	1.26	3.50	5.00
NMeFOSE	24448-09-7	1.07	2.50	5.00
NEtFOSE	1691-99-2	1.37	3.50	5.00
PFOSA	754-91-6	1.58	3.50	5.00
PFBS	375-73-5	0.866	2.50	5.00
PFPeS	2706-91-4	1.02	2.50	5.00
PFHxS	355-46-4	0.997	2.50	5.00
PFHpS	375-92-8	0.841	2.50	5.00
PFOS	1763-23-1	1.07	2.50	5.00
PFNS	68259-12-1	0.701	2.50	5.00
PFDS	335-77-3	0.779	2.50	5.00
PFDoS	79780-39-5	0.803	2.50	5.00
4:2FTS	757124-72-4	1.02	2.50	5.00
6:2FTS	27619-97-2	1.47	3.50	5.00

Analyte	CAS No.	MDL (ng/L)	LOD (ng/L)	LOQ (ng/L)
8:2FTS	39108-34-4	1.01	2.50	5.00
10:2FTS	108026-35-3	1.02	2.50	5.00
3:3 FTCA	356-02-5	1.51	3.50	5.00
5:3 FTCA	914637-49-3	1.12	2.50	5.00
7:3 FTCA	812-70-4	1.01	2.50	5.00
HFPO-DA	13252-13-6	0.865	2.50	5.00
Adona	919005-14-4	0.869	2.50	5.00
9Cl-PF3ONS	756426-58-1	1.03	2.50	5.00
11Cl-PF3OUdS	763051-92-9	0.901	2.50	5.00

Analytes italicized in bold are included on our DoD ELAP scope of accreditation.

Analytical Transitions for PFAS in non-potable water, solid, and tissue

Analyte	CAS No.	Type	Primary Transition	Secondary Transition
NFDHA	151772-58-6	Target	295.0 / 201.0	NA
PFEESA	113507-82-7	Target	315.0 / 135.0	NA
PFMPA	377-73-1	Target	229.0 / 85.0	NA
PFMBA	863090-89-5	Target	279.0 / 85.0	NA
PFBA	375-22-4	Target	213.0 / 169.0	NA
PFPeA	2706-90-3	Target	263.0 / 219.0	NA
PFHxA	307-24-4	Target	313.0 / 269.0	313.0 / 119.0
PFHpA	375-85-9	Target	363.0 / 319.0	363.0 / 169.0
PFOA	335-67-1	Target	413.0 / 369.0	413.0 / 169.0
PFNA	375-95-1	Target	463.0 / 419.0	463.0 / 219.0
PFDA	335-76-2	Target	513.0 / 469.0	513.0 / 219.0
PFUnA	2058-94-8	Target	563.0 / 519.0	563.0 / 269.0
PFDoA	307-55-1	Target	613.0 / 569.0	613.0 / 319.0
PFTrDA	72629-94-8	Target	663.0 / 619.0	663.0 / 169.0
PFTeDA	376-06-7	Target	713.0 / 669.0	713.0 / 169.0
PFHxDA	67905-19-5	Target	813.0 / 769.0	813.0 /119.0
PFODA	16517-11-6	Target	913.0 / 869.0	913.0 / 319.0
NMeFOSAA	2355-31-9	Target	570.0 / 419.0	570.0 / 512.0
NEtFOSAA	2991-50-6	Target	584.0 / 419.0	584.0 / 483.0
NMeFOSA	31506-32-8	Target	512.0 / 219.0	512.0 / 169.0
NEtFOSA	4151-50-2	Target	526.0 / 219.0	526.0 / 169.0
NMeFOSE	24448-09-7	Target	616.0 / 59.0	NA
NEtFOSE	1691-99-2	Target	630.0 / 59.0	NA
PFOSA	754-91-6	Target	498.0 / 78.0	498.0 / 83.0
PFBS	375-73-5	Target	299.0 / 80.0	299.0 / 99.0
PFPeS	2706-91-4	Target	349.0 / 99.0	349.0 / 80.0
PFHxS	355-46-4	Target	399.0 / 80.0	399.0 / 99.0
PFHpS	375-99-6	Target	449.0 / 80.0	449.0 / 99.0
PFOS	1763-23-1	Target	499.0 / 80.0	499.0 / 99.0
PFNS	98789-57-2	Target	549.0 / 99.0	549.0 / 80.0
PFDS	2806-15-7	Target	599.0 / 80.0	599.0 / 99.0

Analyte	CAS No.	Type	Primary Transition	Secondary Transition
PFDoS	79780-39-5	Target	669.0 / 80.0	699.0 / 99.0
4:2FTS	757124-72-4	Target	327.0 / 307.0	327.0 / 80.0
6:2FTS	27619-97-2	Target	427.0 / 407.0	427.0 / 81.0
8:2FTS	39108-34-4	Target	527.0 / 507.0	527.0 / 487.0
10:2FTS	120226-60-0	Target	627.0 / 607.0	NA
3:3 FTCA	356-02-5	Target	241.0 / 177.0	NA
5:3 FTCA	914637-49-3	Target	341.0 / 237.0	NA
7:3 FTCA	812-70-4	Target	441.0 / 337.0	NA
HFPO-DA	13252-13-6	Target	285.0 /169.0	285.0 /118.8
Adona	919005-14-4	Target	377.0 / 251.0	377.0 / 85.0
9Cl-PF3ONS	756426-58-1	Target	531.0 / 351.0	531.0 / 83.0
11Cl-PF3OUdS	763051-92-9	Target	631.0 / 451.0	631.0 / 83.0
$^{13}C_4$-PFBA	NA	SIS[1]	217.0 / 172.0	NA
$^{13}C_5$-PFPeA	NA	SIS[1]	268.0 / 223.0	NA
$^{13}C_5$-PFHxA	NA	SIS[1]	318.0 / 273.0	NA
$^{13}C_4$-PFHpA	NA	SIS[1]	367.0 / 322.0	NA
$^{13}C_8$-PFOA	NA	SIS[1]	421.0 / 376.0	NA
$^{13}C_9$-PFNA	NA	SIS[1]	472.0 / 427.0	NA
$^{13}C_6$-PFDA	NA	SIS[1]	519.0 / 474.0	NA
$^{13}C_7$-PFUnA	NA	SIS[1]	570.0 / 525.0	NA
$^{13}C_2$-PFDoA	NA	SIS[1]	615.0 / 570.0	NA
$^{13}C_2$-PFTeDA	NA	SIS[1]	715.0 / 670.0	NA
$^{13}C_2$-PFHxDA	NA	SIS[1]	815.0 / 770.0	NA
d_3-MeFOSAA	NA	SIS[1]	573.0 / 41//9.0	NA
d_5-EtFOSAA	NA	SIS[1]	589.0 / 419.0	NA
d_3-MeFOSA	NA	SIS[1]	515.0 / 219.0	NA
d_5-EtFOSA	NA	SIS[1]	531.0 / 219.0	NA
d_7-MeFOSE	NA	SIS[1]	623.0 / 59.0	NA
d_9-EtFOSE	NA	SIS[1]	639.0 / 59.0	NA
$^{13}C_8$-FOSA	NA	SIS[1]	506.0 / 78.0	NA
$^{13}C_3$-PFBS	NA	SIS[1]	302.0 / 99.0	NA

Analyte	CAS No.	Type	Primary Transition	Secondary Transition
$^{13}C_3$-PFHxS	NA	SIS[1]	402.0 / 99.0	NA
$^{13}C_8$-PFOS	NA	SIS[1]	507.0 / 99.0	NA
$^{13}C_2$-4:2FTS	NA	SIS[1]	329.0 / 81.0	NA
$^{13}C_2$-6:2FTS	NA	SIS[1]	429.0 / 81.0	NA
$^{13}C_2$-8:2FTS	NA	SIS[1]	529.0 / 81.0	NA
$^{13}C_3$-HFPO-DA	NA	SIS[1]	287.0 / 169.0	NA
$^{13}C_3$-PFBA	NA	IS[2]	216.0 / 172.0	NA
$^{13}C_2$-PFOA	NA	IS[2]	415.0 / 370.0	NA
$^{13}C_2$-PFDA	NA	IS[2]	515.0 / 470.0	NA
$^{13}C_4$-PFOS	NA	IS[2]	503.0 / 99.0	NA

[1] – extracted internal standard (surrogate)
[2] – injection internal standard

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Non-Potable Water Calibration to Sample Equivalents

ICAL (ng/mL)	PIV (mL)[1]	DF[2]	Sample Size (L)	Sample Equivalent (ng/L)[3]
0.050	5	1	0.250	1.0
0.125	5	1	0.250	2.5
0.250	5	1	0.250	5.0
0.500	5	1	0.250	10.0
1.000	5	1	0.250	20.0
2.500	5	1	0.250	50.0
10.000	5	1	0.250	200.0
25.000	5	1	0.250	500.0
50.000	5	1	0.250	1000.0

[1] - Nominal PIV, not used in final calculations

[2] - base level dilution as part of the extraction procedure

[3] - calculated equivalent of a sample based on the ICAL concentration

QTRAP 6500
Preventive Maintenance Checklist

Preventive Maintenance Date:	06APR2023
Request ID:	42191
Company Name:	BATTELLE
Instrument ID:	AD
Instrument Model:	6500 QTRAP
Instrument Serial Number:	BL27151408

☑ **PASS** ☐ **FAIL***

***Any failed result will be resolved in a separate Service Call Request ID:** _____

Preventive Maintenance is performed every year, unless otherwise specified in the Service Contract. It is designed to help maintaining instrument performance and identifying potential instrument deficiencies.

Remarks: THIS REPORT IS AFTER ALL THE REPAIRS AFTER A FAILED PRE PM NO PRE PM DATA ON THIS FORM ALL PRE ON FAILED DOCUMENT

Performed By: chris laflamme Digitally signed by chris laflamme DN: cn=chris laflamme, o=zefsci, ou=service, email=CHRIS@ZEFSCI.COM, c=US Date: 2023.04.07 10:17:44 -04'00' **Date:** 07APR2023

Preventive Maintenance Checklist

Pre-Maintenance Performance Evaluation:

☐ Consult Customer concerning the unit overall performance

☐ Check Logbook for Services recently performed, if available ☐ N/A

☐ Check Vacuum Pressure. Record Results. ☐ Pass ☐ Fail

CAD Settings	Vacuum Reading (x 10^{-5} Torr)	Acceptance Criteria
☐ CAD 0		0.2 to 1.1 x 10^{-5} Torr
☐ CAD 12		1.8 to 4.1 x 10^{-5} Torr

☐ Check for Front end contamination symptoms. Run Q1 POS using POS PPG 2e-7M for a few mins

- Acceptance criteria: No degradation or Sensitivity drop ☐ Pass ☐ Fail

☐ Check for Q3 contamination symptoms. Run Q3 POS using POS PPG 2e-7M for a few mins

- Acceptance criteria: No degradation or Sensitivity drop ☐ Pass ☐ Fail

☐ Perform PPG Tests. Record Results.

Positive Mode: Masses for the peaks of interest are: 59.050, 175.133, 500.380, 616.464, 906.673, 1254.925, 1545.134,1952.427.

High Mass Tests

☐ Perform High Mass Q1 POS using POS PPG 2e-7M (500:1). Scan Rate 10 Da/s. Record 10 mca.

Mass	Q1 Intensity		Q1 Width Value	Width Specs
	Value	Spec		
Q1 500.380		Read Only		Read Only
Q1 616.464		Read Only		Read Only
Q1 906.673		Read Only		Read Only
Q1 1952.427		Read Only		Read Only

☐ Perform High Mass Q3 POS using POS PPG 2e-7M (500:1). Scan Rate 10 Da/s. Record 10 mca.

Mass	Q3 Intensity		Q3 Width Value	Width Specs
	Value	Spec		
Q3 500.380		Read Only		Read Only
Q3 616.464		Read Only		Read Only
Q3 906.673		Read Only		Read Only
Q3 1952.427		Read Only		Read Only

Low Mass Tests

☐ Perform Low Mass Q1 POS using POS PPG 2e-7M (500:1). Scan Rate 10 Da/s. Record 10 mca.

Mass	Q1 Intensity		Q1 Width Value	Width Specs
	Value	Spec		
Q1 175.133		Read Only		Read Only
Q1 500.380		Read Only		Read Only
Q1 616.464		Read Only		Read Only
Q1 906.673		Read Only		Read Only

☐ Perform Low Mass Q3 POS using POS PPG 2e-7M (500:1). Scan Rate 10 Da/s. Record 10 mca.

Mass	Q3 Intensity		Q3 Width Value	Width Specs
	Value	Spec		
Q3 175.133		Read Only		Read Only
Q3 500.380		Read Only		Read Only
Q3 616.464		Read Only		Read Only
Q3 906.673		Read Only		Read Only

Maintenance's Check/Clean/Replace Activities:

☑ Check Cooling Fans for Turbo Pumps while MS is ON

☑ Check QJet and QPS tuning voltage for reference

☑ Check AC input Voltage while MS is OFF. Record Result: 230 ☑ Pass ☐ Fail

- Acceptance Criteria: 200-240VAC
- If Out-of-Range, notify customer

☑ Clean Interface

- ☑ Curtain Plate
- ☑ Orifice Plate
- ☑ QJet
- ☑ Q0 Rods

☑ Check Q0 for signs of arcing

☑ Clean Q0

☑ Check Roughing Pump Oil

- ☐ Top up if necessary (if oil level is below minimum) ☑ N/A
- ☑ Replace if necessary (if oil is 1 year old or very dark) ☐ N/A

☐ Clean or ☑ Replace Oil Exhaust Filter, as necessary (and if applicable. ☐ N/A

☑ Replace 4 Air Filters at the bottom of the mass spectrometer

☑ Allow sufficient time to pump down (overnight if possible)

☑ Perform Maintenance on Turbo V source

☑ Replace Electrode, if necessary ☐ N/A

☑ Check Turbo heaters resistances

☑ Check and/or ☑ Clean diverter valve's rotor and stator, if used ☐ N/A

Post-Maintenance Performance Tests:

☑ Check if Temperature reaches setpoint of 500°C with TIS Probe installed ☑ Pass ☐ Fail

- Acceptance Criteria: temperature reaches setpoint

☐ Check if Temperature reaches setpoint of 500°C with APCI Probe (if installed) ☐ Pass ☐ Fail ☑ N/A

- Acceptance Criteria: temperature reaches setpoint

☑ Set-up Sample for Infusion

☑ Check spray and adjust sprayer's position of the Ion Drive Turbo V source

☑ Check Multiplier Voltage; Optimize if necessary. Record Final Multiplier Voltage: 1900/2200

☑ Check Vacuum Pressure. Record Results. ☑ Pass ☐ Fail

CAD Settings	Vacuum Reading (x 10^{-5} Torr)	Acceptance Criteria
☑ CAD 0	1.0 E-5	0.2 to 1.1 x 10^{-5} Torr
☑ CAD 12	3.5 E-5	1.8 to 4.1 x 10^{-5} Torr

☑ Check for Front end contamination symptoms. Run Q1 POS using POS PPG 2e-7M for a few mins

- Acceptance criteria: No degradation or Sensitivity drop ☑ Pass ☐ Fail

☑ Check for Q3 contamination symptoms. Run Q3 POS using POS PPG 2e-7M for a few mins

- Acceptance criteria: No degradation or Sensitivity drop ☑ Pass ☐ Fail

☑ Perform PPG Tests and Scans. Record Results.

High Mass Tests

Positive Mode: Masses for the peaks of interest are: 59.050, 175.133, 500.380, 616.464, 906.673, 1254.925, 1545.134,1952.427. Mass calibrate to less than 0.1 amu.

Negative Mode: Masses for the peaks of interest are: 44.998, 411.259, 585.385, 933.636, 1223.845, 1572.097, 1863.306, 1979.389. Mass calibrate to less than 0.1 amu.

☑ Perform High Mass Q1 POS ☑ Pass ☐ Fail

Use POS PPG 2e-7M (500:1). Scan Rate 10 Da/s. Record 10 MCA.

Mass	Q1 Intensity		Q1 Width Value	Width Specs
	Value	Spec		
Q1 500.380	4.95 E7	≥ 1.4e7	0.7750	0.6 to 0.8
Q1 616.464	2.05 E7	≥ 9.0e6	0.7646	0.6 to 0.8
Q1 906.673	3.88 E7	≥ 3.3e7	0.7579	0.6 to 0.8
Q1 1952.427	6.45	≥ 6.4e5	0.8000	0.6 to 0.8

☑ Perform High Mass Q3 POS ☑ Pass ☐ Fail

Use POS PPG 2e-7M (500:1). Scan Rate 10 Da/s. Record 10 mca.

Mass	Q3 Intensity		Q3 Width Value	Width Specs
	Value	Spec		
Q3 500.380	4.93 E7	≥ 1.4e7	0.7270	0.6 to 0.8
Q3 616.464	3.44 E7	≥ 9.0e6	0.7197	0.6 to 0.8
Q3 906.673	5.91 E7	≥ 3.3e7	0.7052	0.6 to 0.8
Q3 1952.427	6.45 E5	≥ 6.4e5	0.7889	0.6 to 0.8

☑ Perform High Mass Q1 NEG ☑ Pass ☐ Fail

Use NEG PPG 3 x 10-5 M (10:1). Scan Rate 10 Da/s. Record 10 mca.

Mass	Q1 Intensity		Q1 Width Value	Width Specs
	Value	Spec		
Q1 933.636	2.07 E7	≥ 1.8e7	0.7316	0.6 to 0.8
Q1 1863.306	4.00 E6	≥ 8.0e5	0.6709	0.6 to 0.8

☑ Perform High Mass Q3 NEG ☑ Pass ☐ Fail

Use NEG PPG 3 x 10-5 M (10:1). Scan Rate 10 Da/s. Record 10 mca.

Mass	Q3 Intensity		Q3 Width Value	Width Specs
	Value	Spec		
Q3 933.636	2.18 E7	≥ 1.8e7	0.6817	0.6 to 0.8
Q3 1863.306	8.32 E5	≥ 8.0e5	0.6400	0.6 to 0.8

☑ Perform High Mass ER POS 118.087 and 1521.972 ☑ Pass ☐ Fail

Use Agilent ESI Tuning Mix. Fill Time 0.05ms, Scan rate 1000 Da/s. Record 50 mca.

Mass	ER Intensity		ER Width Value	Width Specs
	Value	Spec		
ER 118.087	8.48 E7	≥ 8.8e6	0.2059	< 0.40
ER 1521.972	4.98 E7	≥ 4.8e7	0.4000	< 0.40

☑ Perform High Mass ER NEG 431.982 and 1633.949 ☑ Pass ☐ Fail

Use Agilent ESI Tuning Mix. Fill Time 0.05ms, Scan rate 1000 Da/s. Record 50 mca.

Mass	ER Intensity		ER Width Value	Width Specs
	Value	Spec		
ER 431.982	4.27 E8	≥ 3.2e7	0.2312	< 0.40
ER 1633.949	2.02 E7	≥ 1.6e7	0.3882	< 0.40

Low Mass Tests

Positive Mode: Masses for the peaks of interest are: 59.050, 175.133, 500.380, 616.464, 906.673. Mass calibrate to less than 0.1 amu.

Negative Mode: Masses for the peaks of interest are: 44.998, 411.259, 585.385, 933.636. Mass calibrate to less than 0.1 amu.

☑ Perform Low Mass Q1 POS ☑ Pass ☐ Fail

Use POS PPG 2 x 10-7M (500:1). Scan Rate 10 Da/s. Record 10 mca.

Mass	Q1 Intensity		Q1 Width Value	Width Specs
	Value	Spec		
Q1 175.133	6.29 E6	≥ 4.8e6	0.6000	0.6 to 0.8
Q1 500.380	3.19 E7	≥ 1.8e7	0.6592	0.6 to 0.8
Q1 616.464	3.26 E7	≥ 1.1e7	0.6191	0.6 to 0.8
Q1 906.673	5.40 E7	≥ 3.6e7	0.7394	0.6 to 0.8

☑ Perform Low Mass Q3 POS ☑ Pass ☐ Fail

Use POS PPG 2 x 10-7M (500:1). Scan Rate 10 Da/s. Record 10 mca.

Mass	Q3 Intensity		Q3 Width Value	Width Specs
	Value	Specs		
Q3 175.133	2.55 E7	≥ 4.8e6	0.6669	0.6 to 0.8
Q3 500.380	5.32 E7	≥ 1.8e7	0.6661	0.6 to 0.8
Q3 616.464	3.28 E7	≥ 1.1e7	0.6752	0.6 to 0.8
Q3 906.673	6.46 E7	≥ 3.6e7	0.6620	0.6 to 0.8

☑ Perform Low Mass MSMS POS in Product Ion scan

Use 907 parent and record daughter 175.1 using POS PPG 2e-7M (500:1). Scan Rate 10 Da/s. Record 10 mca.

Mass	MSMS Intensity		MSMS Width Value	Width Specs
	Value	Spec		
MS/MS 175.1	8.68 E6	Read Only	0.6443	Read Only

☑ Perform Low Mass Q1 NEG ☑ Pass ☐ Fail

Use NEG PPG 3 x 10-5 M (10:1). Scan Rate 10 Da/s. Record 10 mca.

Mass	Q1 Intensity		Q1 Width Value	Width Specs
	Value	Spec		
Q1 933.636	2.18 E7	≥ 1.8e7	0.7101	0.6 to 0.8

☑ Perform Low Mass Q3 NEG ☑ Pass ☐ Fail

Use NEG PPG 3 x 10-5 M (10:1). Scan Rate 10 Da/s. Record 10 mca.

Mass	Q3 Intensity		Q3 Width Value	Width Specs
	Value	Spec		
Q3 933.636	1.82	≥ 1.8e7	0.7565	0.6 to 0.8

☑ Perform Low Mass MSMS NEG in Product Ion scan
Use 933.6 parent and record daughter 45.0 using NEG PPG 3 x 10-5 M (10:1) at the scan rate of 10 Da/s for 10 MCA.

Mass	MSMS Intensity		MSMS Width Value	Width Specs
	Value	Spec		
MS/MS 45.0	2.9 E6	Read Only	0.6631	Read Only

☑ Perform Low Mass ER POS 118.087 and 922.01 ☑ Pass ☐ Fail
Use Agilent ESI Tuning Mix. Fill Time 0.05ms, Scan rate 1000 Da/s. Record 50 mca.

Mass	ER Intensity		ER Width Value	Width Specs
	Value	Spec		
ER 118.087	1.48 E7	≥ 1.2e7	0.2046	< 0.35
ER 922.010	3.88 E8	≥ 1.8e8	0.3240	< 0.35

☑ Perform Low Mass ER NEG 431.982 and 601.978 ☐ Pass ☐ Fail
Use Agilent ES Tuning Mix. Fill Time 0.05ms, Scan rate 1000 Da/s. Record 50 mca.

Mass	ER Intensity		ER Width Value	Width Specs
	Value	Spec		
ER 431.982	9.59 E8	≥ 4.8e7	0.2237	< 0.35
ER 601.978	1.14 E8	≥ 8.0e7	0.2381	< 0.35

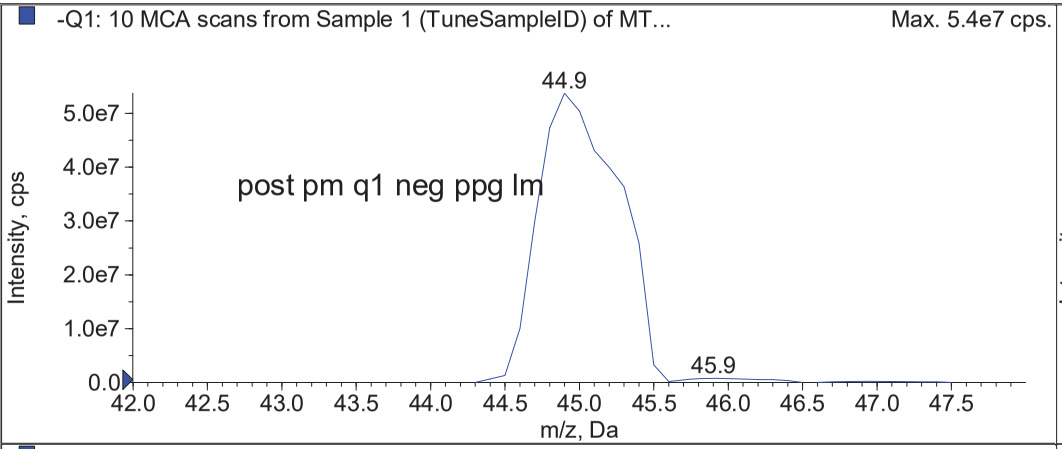
☑ Perform Low Mass EPI POS 397.2 ☑ Pass ☐ Fail
Use Reserpine 0.167pmol/uL. Scan rate 10,000 Da/s. Record 20 mca.

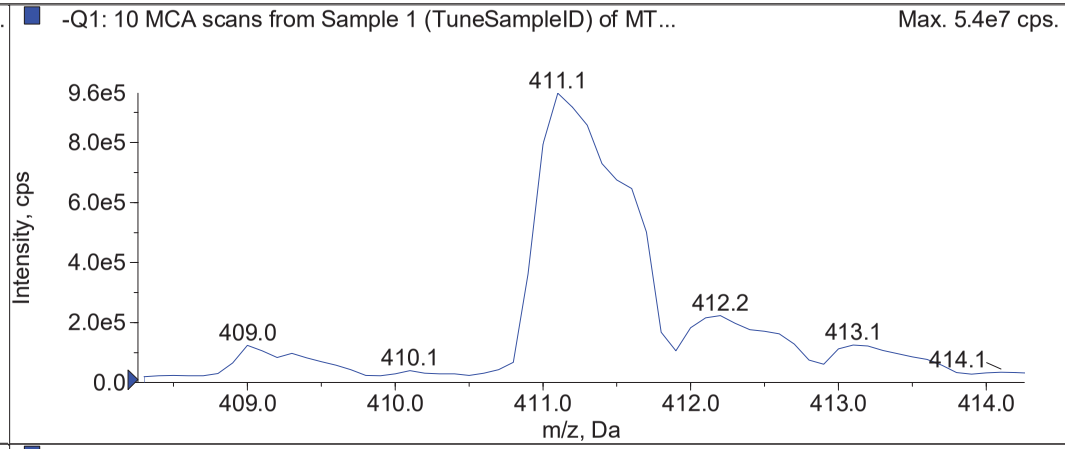
Mass	Q0 Trapping OFF		Q0 Trapping ON	
	Value	Spec	Value	Spec
EPI 397.2	8.82 E6	≥ 8.0e6	1.47 E8	≥ 6.4e7

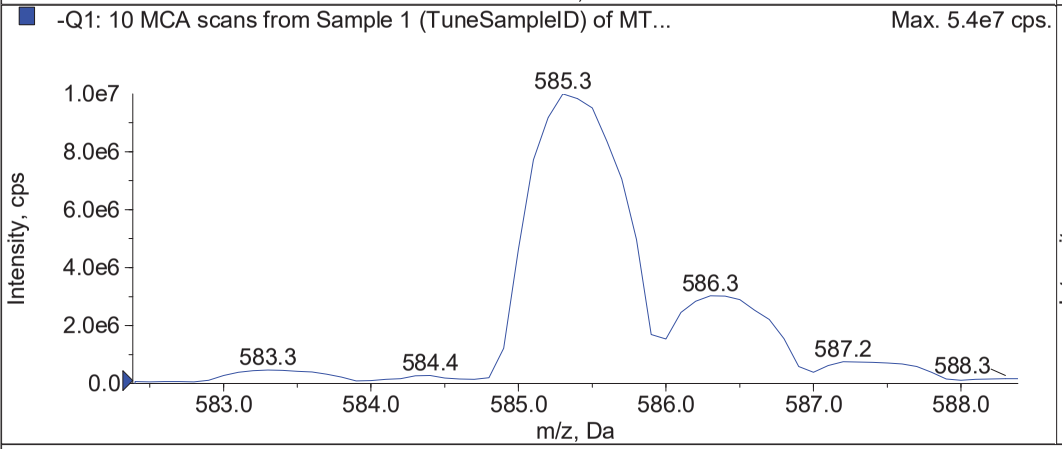
Review:

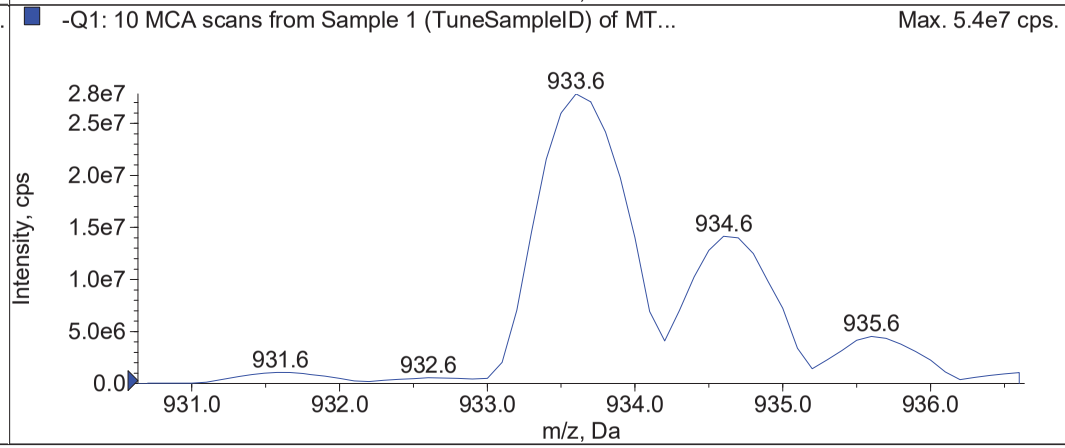
☑ Attach all spectrums printouts to this Checklist
☑ If any parameter setting access modes were changed during the PM, ensure they are returned to their normal access mode and that their offsets are adjusted to match optimized values from the post-PM acquisition files
☐ Empty tuning cache folder if necessary ☑ N/A
☑ Provide Service Report
☑ Fill and replace PM Label

----END OF PREVENTIVE MAINTENANCE PROCEDURE----



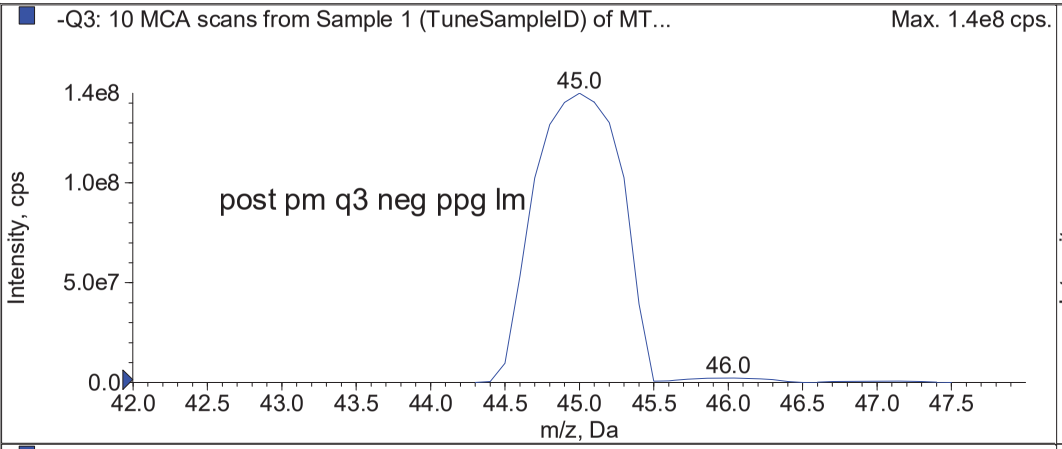


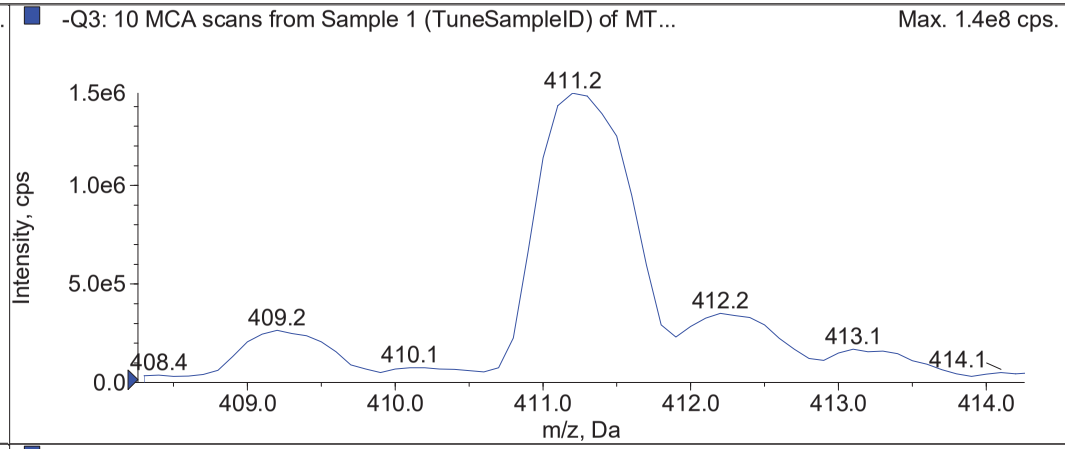


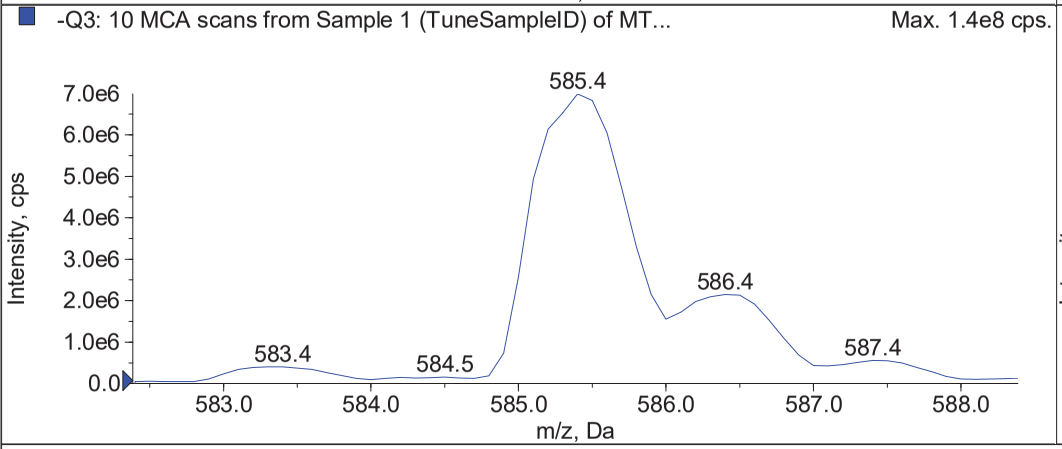


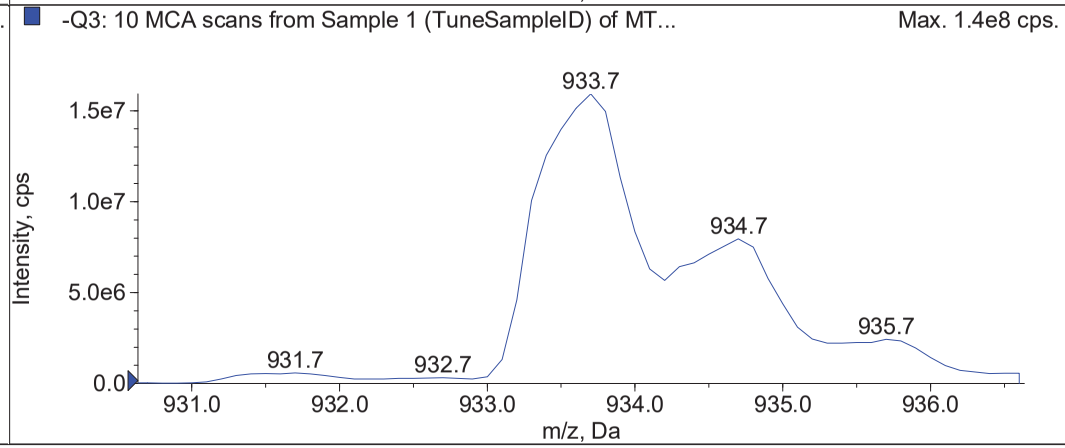
Peak List for " -Q1: 10 MCA scans from Sample 1 (TuneSampleID) of MT20230406152943.wiff (Turbo Spray IonDrive)"

	Target Mass (Da)	Found At (Da)	Intensity (cps)	Width (Da)	Mass Shift (Da)
1	44.9980	44.9947	5.3715e7	0.7059	3.2569e-3
2	411.2590	411.2492	9.6440e5	0.7783	9.7825e-3
3	585.3850	585.3845	9.9981e6	0.7865	5.2386e-4
4	933.6360	933.6353	2.7843e7	0.7101	7.3030e-4
5	1223.8450	n/a	n/a	n/a	n/a
6	1572.0970	n/a	n/a	n/a	n/a
7	1863.3060	n/a	n/a	n/a	n/a
8	1979.3890	n/a	n/a	n/a	n/a



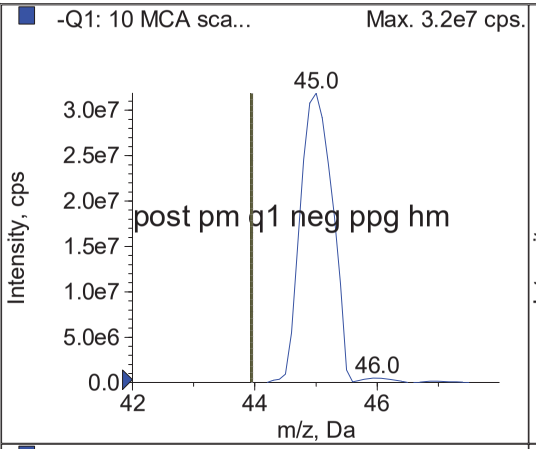


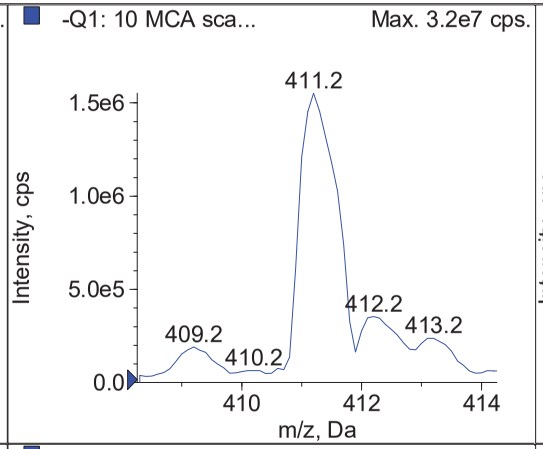


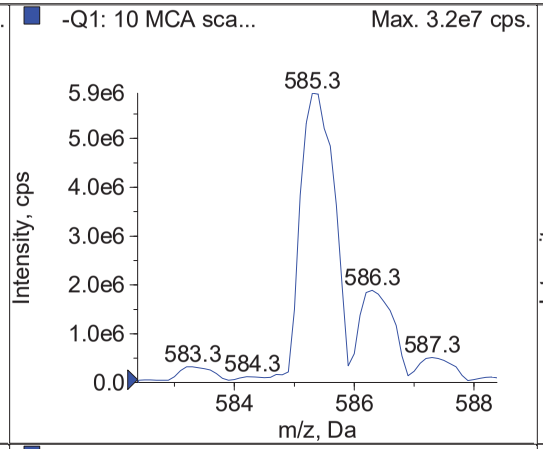


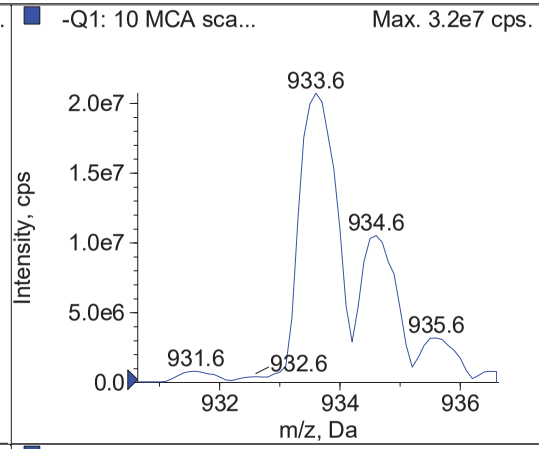
Peak List for "-Q3: 10 MCA scans from Sample 1 (TuneSampleID) of MT20230406153429.wiff (Turbo Spray IonDrive)"

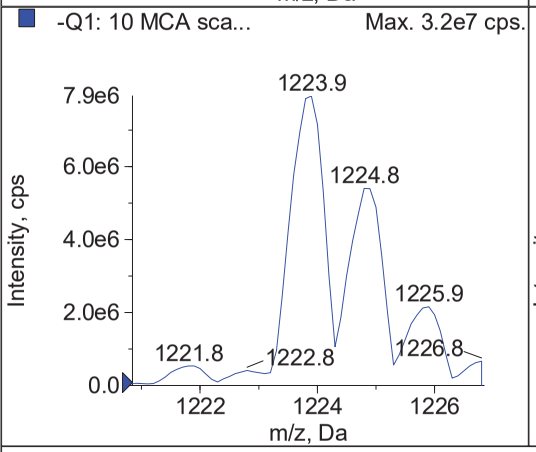
	Target Mass (Da)	Found At (Da)	Intensity (cps)	Width (Da)	Mass Shift (Da)
1	44.9980	45.0006	1.4487e8	0.7089	-2.6268e-3
2	411.2590	411.2749	1.4676e6	0.7464	-0.0159
3	585.3850	585.3967	6.9912e6	0.7467	-0.0117
4	933.6360	933.6315	1.5932e7	0.7569	4.5346e-3
5	1223.8450	n/a	n/a	n/a	n/a
6	1572.0970	n/a	n/a	n/a	n/a
7	1863.3060	n/a	n/a	n/a	n/a
8	1979.3890	n/a	n/a	n/a	n/a

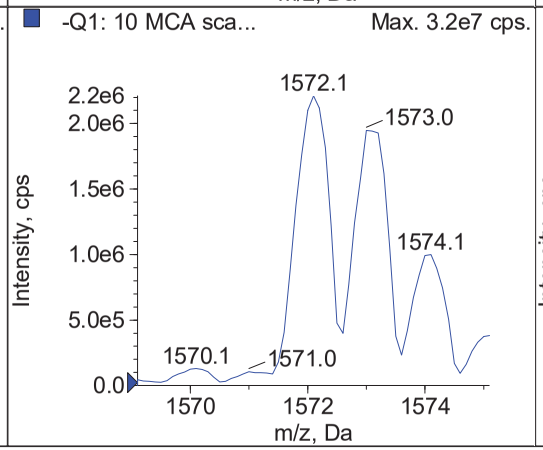


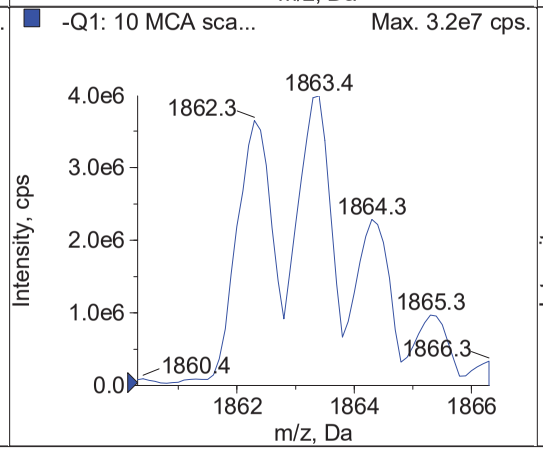


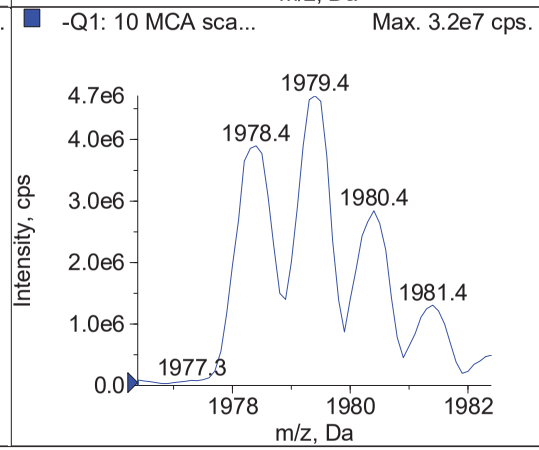






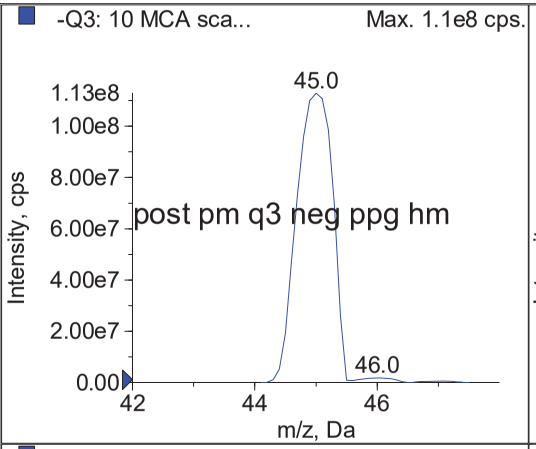


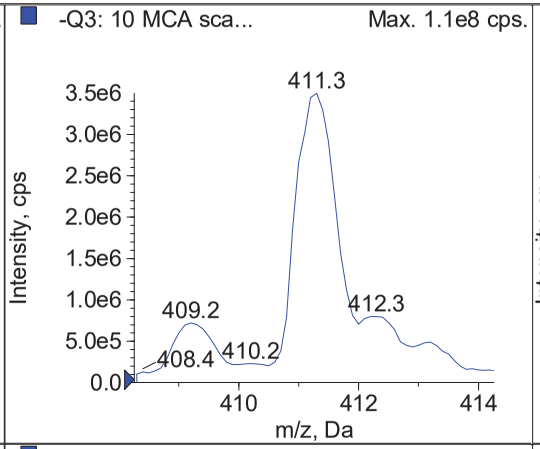


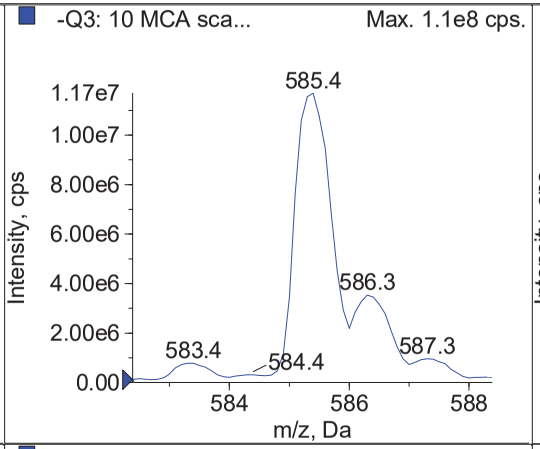


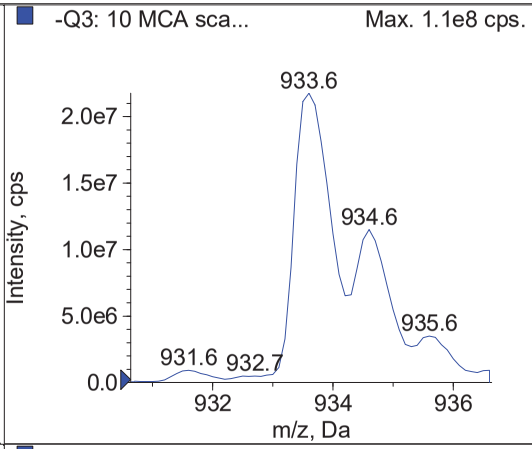
Peak List for "-Q1: 10 MCA scans from Sample 1 (TuneSampleID) of MT20230406151112.wiff (Turbo Spray IonDrive)"

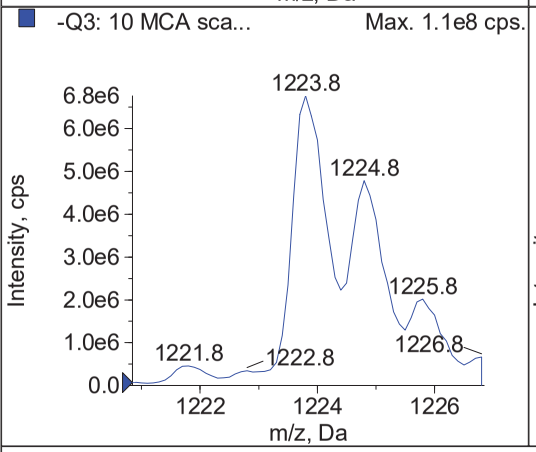
	Target Mass (Da)	Found At (Da)	Intensity (cps)	Width (Da)	Mass Shift (Da)
1	44.9980	45.0074	3.1880e7	0.6224	-9.4339e-3
2	411.2590	411.2647	1.5521e6	0.7609	-5.6865e-3
3	585.3850	585.3837	5.9261e6	0.6780	1.3271e-3
4	933.6360	933.6254	2.0729e7	0.7316	0.0106
5	1223.8450	1223.8414	7.9422e6	0.6711	3.6359e-3
6	1572.0970	1572.0928	2.2120e6	0.6703	4.1518e-3
7	1863.3060	1863.3252	3.9877e6	0.6742	-0.0192
8	1979.3890	1979.3807	4.7117e6	0.6614	8.2592e-3

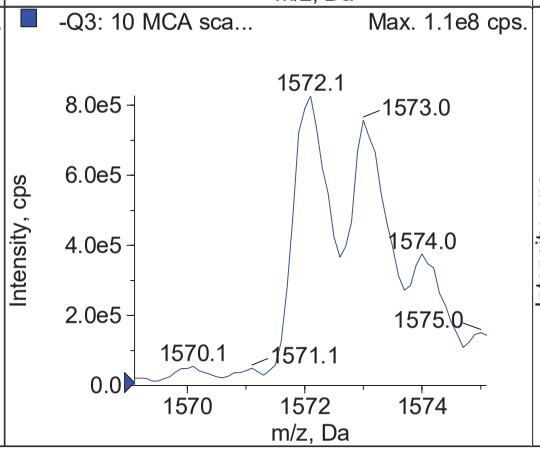


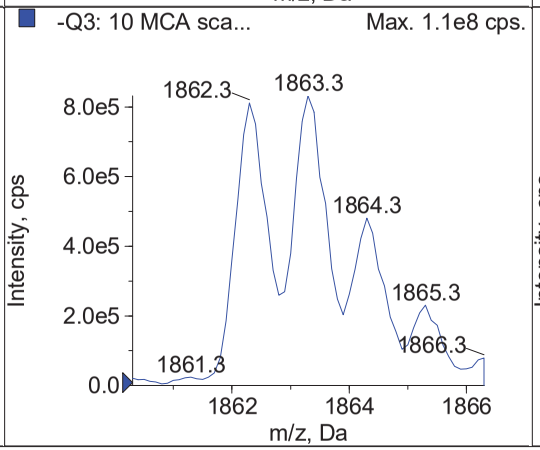


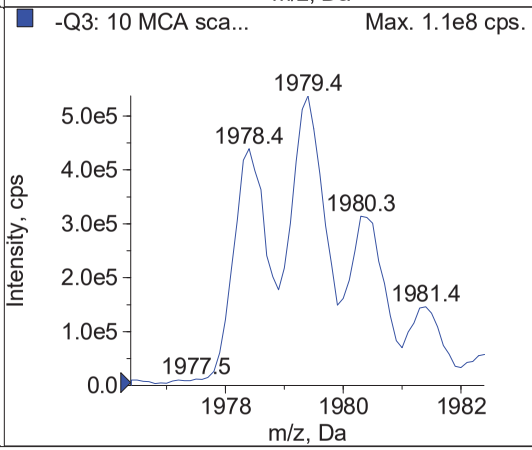












Peak List for "-Q3: 10 MCA scans from Sample 1 (TuneSampleID) of MT20230406151739.wiff (Turbo Spray IonDrive)"

	Target Mass (Da)	Found At (Da)	Intensity (cps)	Width (Da)	Mass Shift (Da)
1	44.9980	44.9973	1.1287e8	0.6955	7.1089e-4
2	411.2590	411.2767	3.4977e6	0.7831	-0.0177
3	585.3850	585.3798	1.1691e7	0.6851	5.2373e-3
4	933.6360	933.6347	2.1756e7	0.6817	1.3424e-3
5	1223.8450	1223.8413	6.7654e6	0.6564	3.7219e-3
6	1572.0970	1572.0987	8.2710e5	0.7552	-1.7395e-3
7	1863.3060	1863.3222	8.3210e5	0.6400	-0.0162
8	1979.3890	1979.3909	5.3750e5	0.6767	-1.9292e-3

Battelle Standard ID	Description	Intermediate Solutions			Battelle Reagent ID (purchased solutions)
LX92	PFAS DoD Surrogate (18 Targets)	-	-	-	230306-08
LX92	PFAS DoD Surrogate (18 Targets)	-	-	-	230306-09
LX92	PFAS DoD Surrogate (18 Targets)	-	-	-	230306-10
LX92	PFAS DoD Surrogate (18 Targets)	-	-	-	230306-11
LX92	PFAS DoD Surrogate (18 Targets)	-	-	-	230306-12
LX92	PFAS DoD Surrogate (18 Targets)	-	-	-	230306-13
LX92	PFAS DoD Surrogate (18 Targets)	-	-	-	230306-14
LX92	PFAS DoD Surrogate (18 Targets)	-	-	-	230306-15
LX92	PFAS DoD Surrogate (18 Targets)	-	-	-	230306-16
LX92	PFAS DoD Surrogate (18 Targets)	-	-	-	230306-17
LX92	PFAS DoD Surrogate (18 Targets)	-	-	-	230306-18
LX92	PFAS DoD Surrogate (18 Targets)	-	-	-	230306-19
LX92	PFAS DoD Surrogate (18 Targets)	-	-	-	230306-20
LX92	PFAS DoD Surrogate (18 Targets)	-	-	-	230306-24
LZ39	PFAS DoD Surrogate (28 Targets)	-	-	-	230210-03
LZ39	PFAS DoD Surrogate (28 Targets)	-	-	-	230210-04
LZ39	PFAS DoD Surrogate (28 Targets)	-	-	-	230210-05
LZ39	PFAS DoD Surrogate (28 Targets)	-	-	-	230210-06
LZ39	PFAS DoD Surrogate (28 Targets)	-	-	-	230210-07
LZ39	PFAS DoD Surrogate (28 Targets)	-	-	-	230210-08
LX91	PFAS DoD Second Source LCS/MS (18 Analytes)	-	-	-	221103-02
LZ03	PFAS DoD Second Source LCS/MS (28 Analytes)	-	-	-	230113-01
LZ03	PFAS DoD Second Source LCS/MS (28 Analytes)	LZ02	-	-	230124-02
LZ03	PFAS DoD Second Source LCS/MS (28 Analytes)	LZ02	-	-	230124-03
LZ03	PFAS DoD Second Source LCS/MS (28 Analytes)	LZ02	-	-	230124-04
LZ07	PFAS DoD Internal Standard	-	-	-	220728-19
LZ07	PFAS DoD Internal Standard	-	-	-	230306-07
LZ07	PFAS DoD Internal Standard	-	-	-	230714-01
LZ07	PFAS DoD Internal Standard	-	-	-	230714-02
LZ83	PFAS DoD ICAL L2	LW18	-	-	220124-04
LZ83	PFAS DoD ICAL L2	LW18	-	-	230124-01
LZ83	PFAS DoD ICAL L2	LW18	-	-	230124-05
LZ83	PFAS DoD ICAL L2	LW18	-	-	230124-06
LZ83	PFAS DoD ICAL L2	LW18	-	-	230124-09
LZ83	PFAS DoD ICAL L2	LX92	-	-	230306-08
LZ83	PFAS DoD ICAL L2	LX92	-	-	230306-09
LZ83	PFAS DoD ICAL L2	LX92	-	-	230306-10
LZ83	PFAS DoD ICAL L2	LX92	-	-	230306-11
LZ83	PFAS DoD ICAL L2	LX92	-	-	230306-12
LZ83	PFAS DoD ICAL L2	LX92	-	-	230306-13
LZ83	PFAS DoD ICAL L2	LX92	-	-	230306-14
LZ83	PFAS DoD ICAL L2	LX92	-	-	230306-15
LZ83	PFAS DoD ICAL L2	LX92	-	-	230306-16
LZ83	PFAS DoD ICAL L2	LX92	-	-	230306-17
LZ83	PFAS DoD ICAL L2	LX92	-	-	230306-18
LZ83	PFAS DoD ICAL L2	LX92	-	-	230306-19
LZ83	PFAS DoD ICAL L2	LX92	-	-	230306-20
LZ83	PFAS DoD ICAL L2	LX92	-	-	230306-24
LZ83	PFAS DoD ICAL L2	LZ07	-	-	220728-19

Battelle Standard ID	Description	Intermediate Solutions			Battelle Reagent ID (purchased solutions)
LZ83	PFAS DoD ICAL L2	LZ07	-	-	230306-07
LZ83	PFAS DoD ICAL L2	LZ07	-	-	230714-01
LZ83	PFAS DoD ICAL L2	LZ07	-	-	230714-02
LZ83	PFAS DoD ICAL L2	LZ39	-	-	230210-03
LZ83	PFAS DoD ICAL L2	LZ39	-	-	230210-04
LZ83	PFAS DoD ICAL L2	LZ39	-	-	230210-05
LZ83	PFAS DoD ICAL L2	LZ39	-	-	230210-06
LZ83	PFAS DoD ICAL L2	LZ39	-	-	230210-07
LZ83	PFAS DoD ICAL L2	LZ39	-	-	230210-08
LZ83	PFAS DoD ICAL L2	LZ81	LZ80	LZ79	230113-02
LZ84	PFAS DoD ICAL L3	LW18	-	-	220124-04
LZ84	PFAS DoD ICAL L3	LW18	-	-	230124-01
LZ84	PFAS DoD ICAL L3	LW18	-	-	230124-05
LZ84	PFAS DoD ICAL L3	LW18	-	-	230124-06
LZ84	PFAS DoD ICAL L3	LW18	-	-	230124-09
LZ84	PFAS DoD ICAL L3	LX92	-	-	230306-08
LZ84	PFAS DoD ICAL L3	LX92	-	-	230306-09
LZ84	PFAS DoD ICAL L3	LX92	-	-	230306-10
LZ84	PFAS DoD ICAL L3	LX92	-	-	230306-11
LZ84	PFAS DoD ICAL L3	LX92	-	-	230306-12
LZ84	PFAS DoD ICAL L3	LX92	-	-	230306-13
LZ84	PFAS DoD ICAL L3	LX92	-	-	230306-14
LZ84	PFAS DoD ICAL L3	LX92	-	-	230306-15
LZ84	PFAS DoD ICAL L3	LX92	-	-	230306-16
LZ84	PFAS DoD ICAL L3	LX92	-	-	230306-17
LZ84	PFAS DoD ICAL L3	LX92	-	-	230306-18
LZ84	PFAS DoD ICAL L3	LX92	-	-	230306-19
LZ84	PFAS DoD ICAL L3	LX92	-	-	230306-20
LZ84	PFAS DoD ICAL L3	LX92	-	-	230306-24
LZ84	PFAS DoD ICAL L3	LZ07	-	-	220728-19
LZ84	PFAS DoD ICAL L3	LZ07	-	-	230306-07
LZ84	PFAS DoD ICAL L3	LZ07	-	-	230714-01
LZ84	PFAS DoD ICAL L3	LZ07	-	-	230714-02
LZ84	PFAS DoD ICAL L3	LZ39	-	-	230210-03
LZ84	PFAS DoD ICAL L3	LZ39	-	-	230210-04
LZ84	PFAS DoD ICAL L3	LZ39	-	-	230210-05
LZ84	PFAS DoD ICAL L3	LZ39	-	-	230210-06
LZ84	PFAS DoD ICAL L3	LZ39	-	-	230210-07
LZ84	PFAS DoD ICAL L3	LZ39	-	-	230210-08
LZ84	PFAS DoD ICAL L3	LZ80	LZ79	-	230113-02
LZ84	PFAS DoD ICAL L3	LZ80	LZ79	LZ02	230124-02
LZ84	PFAS DoD ICAL L3	LZ80	LZ79	LZ02	230124-03
LZ84	PFAS DoD ICAL L3	LZ80	LZ79	LZ02	230124-04
LZ84	PFAS DoD ICAL L3	LZ80	LZ79	LY35	230608-01
LZ84	PFAS DoD ICAL L3	LZ80	LZ79	LY35	230608-02
LZ84	PFAS DoD ICAL L3	LZ80	LZ79	LY35	230608-03
LZ84	PFAS DoD ICAL L3	LZ80	LZ79	LY35	230608-04
LZ84	PFAS DoD ICAL L3	LZ80	LZ79	LY35	230608-05
LZ84	PFAS DoD ICAL L3	LZ80	LZ79	LY35	230608-06

Battelle Standard ID	Description	Intermediate Solutions			Battelle Reagent ID (purchased solutions)
LZ84	PFAS DoD ICAL L3	LZ80	LZ79	LY35	230608-07
LZ84	PFAS DoD ICAL L3	LZ80	LZ79	LY35	230608-08
LZ84	PFAS DoD ICAL L3	LZ80	LZ79	LY35	230608-09
LZ84	PFAS DoD ICAL L3	LZ80	LZ79	LY35	230608-10
LZ84	PFAS DoD ICAL L3	LZ80	LZ79	LY35	230608-11
LZ84	PFAS DoD ICAL L3	LZ80	LZ79	LY35	230608-12
LZ85	PFAS DoD ICAL L4	LW18	-	-	220124-04
LZ85	PFAS DoD ICAL L4	LW18	-	-	230124-01
LZ85	PFAS DoD ICAL L4	LW18	-	-	230124-05
LZ85	PFAS DoD ICAL L4	LW18	-	-	230124-06
LZ85	PFAS DoD ICAL L4	LW18	-	-	230124-09
LZ85	PFAS DoD ICAL L4	LX92	-	-	230306-08
LZ85	PFAS DoD ICAL L4	LX92	-	-	230306-09
LZ85	PFAS DoD ICAL L4	LX92	-	-	230306-10
LZ85	PFAS DoD ICAL L4	LX92	-	-	230306-11
LZ85	PFAS DoD ICAL L4	LX92	-	-	230306-12
LZ85	PFAS DoD ICAL L4	LX92	-	-	230306-13
LZ85	PFAS DoD ICAL L4	LX92	-	-	230306-14
LZ85	PFAS DoD ICAL L4	LX92	-	-	230306-15
LZ85	PFAS DoD ICAL L4	LX92	-	-	230306-16
LZ85	PFAS DoD ICAL L4	LX92	-	-	230306-17
LZ85	PFAS DoD ICAL L4	LX92	-	-	230306-18
LZ85	PFAS DoD ICAL L4	LX92	-	-	230306-19
LZ85	PFAS DoD ICAL L4	LX92	-	-	230306-20
LZ85	PFAS DoD ICAL L4	LX92	-	-	230306-24
LZ85	PFAS DoD ICAL L4	LZ07	-	-	220728-19
LZ85	PFAS DoD ICAL L4	LZ07	-	-	230306-07
LZ85	PFAS DoD ICAL L4	LZ07	-	-	230714-01
LZ85	PFAS DoD ICAL L4	LZ07	-	-	230714-02
LZ85	PFAS DoD ICAL L4	LZ39	-	-	230210-03
LZ85	PFAS DoD ICAL L4	LZ39	-	-	230210-04
LZ85	PFAS DoD ICAL L4	LZ39	-	-	230210-05
LZ85	PFAS DoD ICAL L4	LZ39	-	-	230210-06
LZ85	PFAS DoD ICAL L4	LZ39	-	-	230210-07
LZ85	PFAS DoD ICAL L4	LZ39	-	-	230210-08
LZ85	PFAS DoD ICAL L4	LZ80	LZ79	-	230113-02
LZ85	PFAS DoD ICAL L4	LZ80	LZ79	LZ02	230124-02
LZ85	PFAS DoD ICAL L4	LZ80	LZ79	LZ02	230124-03
LZ85	PFAS DoD ICAL L4	LZ80	LZ79	LZ02	230124-04
LZ85	PFAS DoD ICAL L4	LZ80	LZ79	LY35	230608-01
LZ85	PFAS DoD ICAL L4	LZ80	LZ79	LY35	230608-02
LZ85	PFAS DoD ICAL L4	LZ80	LZ79	LY35	230608-03
LZ85	PFAS DoD ICAL L4	LZ80	LZ79	LY35	230608-04
LZ85	PFAS DoD ICAL L4	LZ80	LZ79	LY35	230608-05
LZ85	PFAS DoD ICAL L4	LZ80	LZ79	LY35	230608-06
LZ85	PFAS DoD ICAL L4	LZ80	LZ79	LY35	230608-07
LZ85	PFAS DoD ICAL L4	LZ80	LZ79	LY35	230608-08
LZ85	PFAS DoD ICAL L4	LZ80	LZ79	LY35	230608-09
LZ85	PFAS DoD ICAL L4	LZ80	LZ79	LY35	230608-10

Battelle Standard ID	Description	Intermediate Solutions			Battelle Reagent ID (purchased solutions)
LZ85	PFAS DoD ICAL L4	LZ80	LZ79	LY35	230608-11
LZ85	PFAS DoD ICAL L4	LZ80	LZ79	LY35	230608-12
LZ86	PFAS DoD ICAL L5	LW18	-	-	220124-04
LZ86	PFAS DoD ICAL L5	LW18	-	-	230124-01
LZ86	PFAS DoD ICAL L5	LW18	-	-	230124-05
LZ86	PFAS DoD ICAL L5	LW18	-	-	230124-06
LZ86	PFAS DoD ICAL L5	LW18	-	-	230124-09
LZ86	PFAS DoD ICAL L5	LX92	-	-	230306-08
LZ86	PFAS DoD ICAL L5	LX92	-	-	230306-09
LZ86	PFAS DoD ICAL L5	LX92	-	-	230306-10
LZ86	PFAS DoD ICAL L5	LX92	-	-	230306-11
LZ86	PFAS DoD ICAL L5	LX92	-	-	230306-12
LZ86	PFAS DoD ICAL L5	LX92	-	-	230306-13
LZ86	PFAS DoD ICAL L5	LX92	-	-	230306-14
LZ86	PFAS DoD ICAL L5	LX92	-	-	230306-15
LZ86	PFAS DoD ICAL L5	LX92	-	-	230306-16
LZ86	PFAS DoD ICAL L5	LX92	-	-	230306-17
LZ86	PFAS DoD ICAL L5	LX92	-	-	230306-18
LZ86	PFAS DoD ICAL L5	LX92	-	-	230306-19
LZ86	PFAS DoD ICAL L5	LX92	-	-	230306-20
LZ86	PFAS DoD ICAL L5	LX92	-	-	230306-24
LZ86	PFAS DoD ICAL L5	LZ07	-	-	220728-19
LZ86	PFAS DoD ICAL L5	LZ07	-	-	230306-07
LZ86	PFAS DoD ICAL L5	LZ07	-	-	230714-01
LZ86	PFAS DoD ICAL L5	LZ07	-	-	230714-02
LZ86	PFAS DoD ICAL L5	LZ39	-	-	230210-03
LZ86	PFAS DoD ICAL L5	LZ39	-	-	230210-04
LZ86	PFAS DoD ICAL L5	LZ39	-	-	230210-05
LZ86	PFAS DoD ICAL L5	LZ39	-	-	230210-06
LZ86	PFAS DoD ICAL L5	LZ39	-	-	230210-07
LZ86	PFAS DoD ICAL L5	LZ39	-	-	230210-08
LZ86	PFAS DoD ICAL L5	LZ80	LZ79	-	230113-02
LZ86	PFAS DoD ICAL L5	LZ80	LZ79	LZ02	230124-02
LZ86	PFAS DoD ICAL L5	LZ80	LZ79	LZ02	230124-03
LZ86	PFAS DoD ICAL L5	LZ80	LZ79	LZ02	230124-04
LZ86	PFAS DoD ICAL L5	LZ80	LZ79	LY35	230608-01
LZ86	PFAS DoD ICAL L5	LZ80	LZ79	LY35	230608-02
LZ86	PFAS DoD ICAL L5	LZ80	LZ79	LY35	230608-03
LZ86	PFAS DoD ICAL L5	LZ80	LZ79	LY35	230608-04
LZ86	PFAS DoD ICAL L5	LZ80	LZ79	LY35	230608-05
LZ86	PFAS DoD ICAL L5	LZ80	LZ79	LY35	230608-06
LZ86	PFAS DoD ICAL L5	LZ80	LZ79	LY35	230608-07
LZ86	PFAS DoD ICAL L5	LZ80	LZ79	LY35	230608-08
LZ86	PFAS DoD ICAL L5	LZ80	LZ79	LY35	230608-09
LZ86	PFAS DoD ICAL L5	LZ80	LZ79	LY35	230608-10
LZ86	PFAS DoD ICAL L5	LZ80	LZ79	LY35	230608-11
LZ86	PFAS DoD ICAL L5	LZ80	LZ79	LY35	230608-12
LZ87	PFAS DoD ICAL L6	LW18	-	-	220124-04
LZ87	PFAS DoD ICAL L6	LW18	-	-	230124-01

Battelle Standard ID	Description	Intermediate Solutions			Battelle Reagent ID (purchased solutions)
LZ87	PFAS DoD ICAL L6	LW18	-	-	230124-05
LZ87	PFAS DoD ICAL L6	LW18	-	-	230124-06
LZ87	PFAS DoD ICAL L6	LW18	-	-	230124-09
LZ87	PFAS DoD ICAL L6	LX92	-	-	230306-08
LZ87	PFAS DoD ICAL L6	LX92	-	-	230306-09
LZ87	PFAS DoD ICAL L6	LX92	-	-	230306-10
LZ87	PFAS DoD ICAL L6	LX92	-	-	230306-11
LZ87	PFAS DoD ICAL L6	LX92	-	-	230306-12
LZ87	PFAS DoD ICAL L6	LX92	-	-	230306-13
LZ87	PFAS DoD ICAL L6	LX92	-	-	230306-14
LZ87	PFAS DoD ICAL L6	LX92	-	-	230306-15
LZ87	PFAS DoD ICAL L6	LX92	-	-	230306-16
LZ87	PFAS DoD ICAL L6	LX92	-	-	230306-17
LZ87	PFAS DoD ICAL L6	LX92	-	-	230306-18
LZ87	PFAS DoD ICAL L6	LX92	-	-	230306-19
LZ87	PFAS DoD ICAL L6	LX92	-	-	230306-20
LZ87	PFAS DoD ICAL L6	LX92	-	-	230306-24
LZ87	PFAS DoD ICAL L6	LZ07	-	-	220728-19
LZ87	PFAS DoD ICAL L6	LZ07	-	-	230306-07
LZ87	PFAS DoD ICAL L6	LZ07	-	-	230714-01
LZ87	PFAS DoD ICAL L6	LZ07	-	-	230714-02
LZ87	PFAS DoD ICAL L6	LZ39	-	-	230210-03
LZ87	PFAS DoD ICAL L6	LZ39	-	-	230210-04
LZ87	PFAS DoD ICAL L6	LZ39	-	-	230210-05
LZ87	PFAS DoD ICAL L6	LZ39	-	-	230210-06
LZ87	PFAS DoD ICAL L6	LZ39	-	-	230210-07
LZ87	PFAS DoD ICAL L6	LZ39	-	-	230210-08
LZ87	PFAS DoD ICAL L6	LZ79	-	-	230113-02
LZ87	PFAS DoD ICAL L6	LZ79	LZ02	-	230124-02
LZ87	PFAS DoD ICAL L6	LZ79	LZ02	-	230124-03
LZ87	PFAS DoD ICAL L6	LZ79	LZ02	-	230124-04
LZ87	PFAS DoD ICAL L6	LZ79	LY35	-	230608-01
LZ87	PFAS DoD ICAL L6	LZ79	LY35	-	230608-02
LZ87	PFAS DoD ICAL L6	LZ79	LY35	-	230608-03
LZ87	PFAS DoD ICAL L6	LZ79	LY35	-	230608-04
LZ87	PFAS DoD ICAL L6	LZ79	LY35	-	230608-05
LZ87	PFAS DoD ICAL L6	LZ79	LY35	-	230608-06
LZ87	PFAS DoD ICAL L6	LZ79	LY35	-	230608-07
LZ87	PFAS DoD ICAL L6	LZ79	LY35	-	230608-08
LZ87	PFAS DoD ICAL L6	LZ79	LY35	-	230608-09
LZ87	PFAS DoD ICAL L6	LZ79	LY35	-	230608-10
LZ87	PFAS DoD ICAL L6	LZ79	LY35	-	230608-11
LZ87	PFAS DoD ICAL L6	LZ79	LY35	-	230608-12
LZ88	PFAS DoD ICAL L7	LW18	-	-	220124-04
LZ88	PFAS DoD ICAL L7	LW18	-	-	230124-01
LZ88	PFAS DoD ICAL L7	LW18	-	-	230124-05
LZ88	PFAS DoD ICAL L7	LW18	-	-	230124-06
LZ88	PFAS DoD ICAL L7	LW18	-	-	230124-09
LZ88	PFAS DoD ICAL L7	LX92	-	-	230306-08

Battelle Standard ID	Description	Intermediate Solutions			Battelle Reagent ID (purchased solutions)
LZ88	PFAS DoD ICAL L7	LX92	-	-	230306-09
LZ88	PFAS DoD ICAL L7	LX92	-	-	230306-10
LZ88	PFAS DoD ICAL L7	LX92	-	-	230306-11
LZ88	PFAS DoD ICAL L7	LX92	-	-	230306-12
LZ88	PFAS DoD ICAL L7	LX92	-	-	230306-13
LZ88	PFAS DoD ICAL L7	LX92	-	-	230306-14
LZ88	PFAS DoD ICAL L7	LX92	-	-	230306-15
LZ88	PFAS DoD ICAL L7	LX92	-	-	230306-16
LZ88	PFAS DoD ICAL L7	LX92	-	-	230306-17
LZ88	PFAS DoD ICAL L7	LX92	-	-	230306-18
LZ88	PFAS DoD ICAL L7	LX92	-	-	230306-19
LZ88	PFAS DoD ICAL L7	LX92	-	-	230306-20
LZ88	PFAS DoD ICAL L7	LX92	-	-	230306-24
LZ88	PFAS DoD ICAL L7	LZ07	-	-	220728-19
LZ88	PFAS DoD ICAL L7	LZ07	-	-	230306-07
LZ88	PFAS DoD ICAL L7	LZ07	-	-	230714-01
LZ88	PFAS DoD ICAL L7	LZ07	-	-	230714-02
LZ88	PFAS DoD ICAL L7	LZ39	-	-	230210-03
LZ88	PFAS DoD ICAL L7	LZ39	-	-	230210-04
LZ88	PFAS DoD ICAL L7	LZ39	-	-	230210-05
LZ88	PFAS DoD ICAL L7	LZ39	-	-	230210-06
LZ88	PFAS DoD ICAL L7	LZ39	-	-	230210-07
LZ88	PFAS DoD ICAL L7	LZ39	-	-	230210-08
LZ88	PFAS DoD ICAL L7	LZ79	-	-	230113-02
LZ88	PFAS DoD ICAL L7	LZ79	LZ02	-	230124-02
LZ88	PFAS DoD ICAL L7	LZ79	LZ02	-	230124-03
LZ88	PFAS DoD ICAL L7	LZ79	LZ02	-	230124-04
LZ88	PFAS DoD ICAL L7	LZ79	LY35	-	230608-01
LZ88	PFAS DoD ICAL L7	LZ79	LY35	-	230608-02
LZ88	PFAS DoD ICAL L7	LZ79	LY35	-	230608-03
LZ88	PFAS DoD ICAL L7	LZ79	LY35	-	230608-04
LZ88	PFAS DoD ICAL L7	LZ79	LY35	-	230608-05
LZ88	PFAS DoD ICAL L7	LZ79	LY35	-	230608-06
LZ88	PFAS DoD ICAL L7	LZ79	LY35	-	230608-07
LZ88	PFAS DoD ICAL L7	LZ79	LY35	-	230608-08
LZ88	PFAS DoD ICAL L7	LZ79	LY35	-	230608-09
LZ88	PFAS DoD ICAL L7	LZ79	LY35	-	230608-10
LZ88	PFAS DoD ICAL L7	LZ79	LY35	-	230608-11
LZ88	PFAS DoD ICAL L7	LZ79	LY35	-	230608-12
LZ89	PFAS DoD ICAL L8	LW18	-	-	220124-04
LZ89	PFAS DoD ICAL L8	LW18	-	-	230124-01
LZ89	PFAS DoD ICAL L8	LW18	-	-	230124-05
LZ89	PFAS DoD ICAL L8	LW18	-	-	230124-06
LZ89	PFAS DoD ICAL L8	LW18	-	-	230124-09
LZ89	PFAS DoD ICAL L8	LX92	-	-	230306-08
LZ89	PFAS DoD ICAL L8	LX92	-	-	230306-09
LZ89	PFAS DoD ICAL L8	LX92	-	-	230306-10
LZ89	PFAS DoD ICAL L8	LX92	-	-	230306-11
LZ89	PFAS DoD ICAL L8	LX92	-	-	230306-12

Battelle Standard ID	Description	Intermediate Solutions			Battelle Reagent ID (purchased solutions)
LZ89	PFAS DoD ICAL L8	LX92	-	-	230306-13
LZ89	PFAS DoD ICAL L8	LX92	-	-	230306-14
LZ89	PFAS DoD ICAL L8	LX92	-	-	230306-15
LZ89	PFAS DoD ICAL L8	LX92	-	-	230306-16
LZ89	PFAS DoD ICAL L8	LX92	-	-	230306-17
LZ89	PFAS DoD ICAL L8	LX92	-	-	230306-18
LZ89	PFAS DoD ICAL L8	LX92	-	-	230306-19
LZ89	PFAS DoD ICAL L8	LX92	-	-	230306-20
LZ89	PFAS DoD ICAL L8	LX92	-	-	230306-24
LZ89	PFAS DoD ICAL L8	LZ07	-	-	220728-19
LZ89	PFAS DoD ICAL L8	LZ07	-	-	230306-07
LZ89	PFAS DoD ICAL L8	LZ07	-	-	230714-01
LZ89	PFAS DoD ICAL L8	LZ07	-	-	230714-02
LZ89	PFAS DoD ICAL L8	LZ39	-	-	230210-03
LZ89	PFAS DoD ICAL L8	LZ39	-	-	230210-04
LZ89	PFAS DoD ICAL L8	LZ39	-	-	230210-05
LZ89	PFAS DoD ICAL L8	LZ39	-	-	230210-06
LZ89	PFAS DoD ICAL L8	LZ39	-	-	230210-07
LZ89	PFAS DoD ICAL L8	LZ39	-	-	230210-08
LZ89	PFAS DoD ICAL L8	LZ79	-	-	230113-02
LZ89	PFAS DoD ICAL L8	LZ79	LZ02	-	230124-02
LZ89	PFAS DoD ICAL L8	LZ79	LZ02	-	230124-03
LZ89	PFAS DoD ICAL L8	LZ79	LZ02	-	230124-04
LZ89	PFAS DoD ICAL L8	LZ79	LY35	-	230608-01
LZ89	PFAS DoD ICAL L8	LZ79	LY35	-	230608-02
LZ89	PFAS DoD ICAL L8	LZ79	LY35	-	230608-03
LZ89	PFAS DoD ICAL L8	LZ79	LY35	-	230608-04
LZ89	PFAS DoD ICAL L8	LZ79	LY35	-	230608-05
LZ89	PFAS DoD ICAL L8	LZ79	LY35	-	230608-06
LZ89	PFAS DoD ICAL L8	LZ79	LY35	-	230608-07
LZ89	PFAS DoD ICAL L8	LZ79	LY35	-	230608-08
LZ89	PFAS DoD ICAL L8	LZ79	LY35	-	230608-09
LZ89	PFAS DoD ICAL L8	LZ79	LY35	-	230608-10
LZ89	PFAS DoD ICAL L8	LZ79	LY35	-	230608-11
LZ89	PFAS DoD ICAL L8	LZ79	LY35	-	230608-12
LZ90	PFAS DoD ICAL L9	LW18	-	-	220124-04
LZ90	PFAS DoD ICAL L9	LW18	-	-	230124-01
LZ90	PFAS DoD ICAL L9	LW18	-	-	230124-05
LZ90	PFAS DoD ICAL L9	LW18	-	-	230124-06
LZ90	PFAS DoD ICAL L9	LW18	-	-	230124-09
LZ90	PFAS DoD ICAL L9	LX92	-	-	230306-08
LZ90	PFAS DoD ICAL L9	LX92	-	-	230306-09
LZ90	PFAS DoD ICAL L9	LX92	-	-	230306-10
LZ90	PFAS DoD ICAL L9	LX92	-	-	230306-11
LZ90	PFAS DoD ICAL L9	LX92	-	-	230306-12
LZ90	PFAS DoD ICAL L9	LX92	-	-	230306-13
LZ90	PFAS DoD ICAL L9	LX92	-	-	230306-14
LZ90	PFAS DoD ICAL L9	LX92	-	-	230306-15
LZ90	PFAS DoD ICAL L9	LX92	-	-	230306-16

Battelle Standard ID	Description	Intermediate Solutions			Battelle Reagent ID (purchased solutions)
LZ90	PFAS DoD ICAL L9	LX92	-	-	230306-17
LZ90	PFAS DoD ICAL L9	LX92	-	-	230306-18
LZ90	PFAS DoD ICAL L9	LX92	-	-	230306-19
LZ90	PFAS DoD ICAL L9	LX92	-	-	230306-20
LZ90	PFAS DoD ICAL L9	LX92	-	-	230306-24
LZ90	PFAS DoD ICAL L9	LZ07	-	-	220728-19
LZ90	PFAS DoD ICAL L9	LZ07	-	-	230306-07
LZ90	PFAS DoD ICAL L9	LZ07	-	-	230714-01
LZ90	PFAS DoD ICAL L9	LZ07	-	-	230714-02
LZ90	PFAS DoD ICAL L9	LZ39	-	-	230210-03
LZ90	PFAS DoD ICAL L9	LZ39	-	-	230210-04
LZ90	PFAS DoD ICAL L9	LZ39	-	-	230210-05
LZ90	PFAS DoD ICAL L9	LZ39	-	-	230210-06
LZ90	PFAS DoD ICAL L9	LZ39	-	-	230210-07
LZ90	PFAS DoD ICAL L9	LZ39	-	-	230210-08
LZ90	PFAS DoD ICAL L9	LZ79	-	-	230113-02
LZ90	PFAS DoD ICAL L9	LZ79	LZ02	-	230124-02
LZ90	PFAS DoD ICAL L9	LZ79	LZ02	-	230124-03
LZ90	PFAS DoD ICAL L9	LZ79	LZ02	-	230124-04
LZ90	PFAS DoD ICAL L9	LZ79	LY35	-	230608-01
LZ90	PFAS DoD ICAL L9	LZ79	LY35	-	230608-02
LZ90	PFAS DoD ICAL L9	LZ79	LY35	-	230608-03
LZ90	PFAS DoD ICAL L9	LZ79	LY35	-	230608-04
LZ90	PFAS DoD ICAL L9	LZ79	LY35	-	230608-05
LZ90	PFAS DoD ICAL L9	LZ79	LY35	-	230608-06
LZ90	PFAS DoD ICAL L9	LZ79	LY35	-	230608-07
LZ90	PFAS DoD ICAL L9	LZ79	LY35	-	230608-08
LZ90	PFAS DoD ICAL L9	LZ79	LY35	-	230608-09
LZ90	PFAS DoD ICAL L9	LZ79	LY35	-	230608-10
LZ90	PFAS DoD ICAL L9	LZ79	LY35	-	230608-11
LZ90	PFAS DoD ICAL L9	LZ79	LY35	-	230608-12
LZ92	PFAS DoD ICC	LW18	-	-	220124-04
LZ92	PFAS DoD ICC	LW18	-	-	230124-01
LZ92	PFAS DoD ICC	LW18	-	-	230124-05
LZ92	PFAS DoD ICC	LW18	-	-	230124-06
LZ92	PFAS DoD ICC	LW18	-	-	230124-09
LZ92	PFAS DoD ICC	LX92	-	-	230306-08
LZ92	PFAS DoD ICC	LX92	-	-	230306-09
LZ92	PFAS DoD ICC	LX92	-	-	230306-10
LZ92	PFAS DoD ICC	LX92	-	-	230306-11
LZ92	PFAS DoD ICC	LX92	-	-	230306-12
LZ92	PFAS DoD ICC	LX92	-	-	230306-13
LZ92	PFAS DoD ICC	LX92	-	-	230306-14
LZ92	PFAS DoD ICC	LX92	-	-	230306-15
LZ92	PFAS DoD ICC	LX92	-	-	230306-16
LZ92	PFAS DoD ICC	LX92	-	-	230306-17
LZ92	PFAS DoD ICC	LX92	-	-	230306-18
LZ92	PFAS DoD ICC	LX92	-	-	230306-19
LZ92	PFAS DoD ICC	LX92	-	-	230306-20

Battelle Standard ID	Description	Intermediate Solutions			Battelle Reagent ID (purchased solutions)
LZ92	PFAS DoD ICC	LX92	-	-	230306-24
LZ92	PFAS DoD ICC	LZ07	-	-	220728-19
LZ92	PFAS DoD ICC	LZ07	-	-	230306-07
LZ92	PFAS DoD ICC	LZ07	-	-	230714-01
LZ92	PFAS DoD ICC	LZ07	-	-	230714-02
LZ92	PFAS DoD ICC	LZ32	-	-	230113-01
LZ92	PFAS DoD ICC	LZ32	LZ02	-	230124-02
LZ92	PFAS DoD ICC	LZ32	LZ02	-	230124-03
LZ92	PFAS DoD ICC	LZ32	LZ02	-	230124-04
LZ92	PFAS DoD ICC	LZ32	LY34	-	230608-01
LZ92	PFAS DoD ICC	LZ32	LY34	-	230608-02
LZ92	PFAS DoD ICC	LZ32	LY34	-	230608-03
LZ92	PFAS DoD ICC	LZ32	LY34	-	230608-04
LZ92	PFAS DoD ICC	LZ32	LY34	-	230608-05
LZ92	PFAS DoD ICC	LZ32	LY34	-	230608-06
LZ92	PFAS DoD ICC	LZ32	LY34	-	230608-07
LZ92	PFAS DoD ICC	LZ32	LY34	-	230608-08
LZ92	PFAS DoD ICC	LZ32	LY34	-	230608-09
LZ92	PFAS DoD ICC	LZ32	LY34	-	230608-10
LZ92	PFAS DoD ICC	LZ32	LY34	-	230608-11
LZ92	PFAS DoD ICC	LZ32	LY34	-	230608-12
LZ92	PFAS DoD ICC	LZ39	-	-	230210-03
LZ92	PFAS DoD ICC	LZ39	-	-	230210-04
LZ92	PFAS DoD ICC	LZ39	-	-	230210-05
LZ92	PFAS DoD ICC	LZ39	-	-	230210-06
LZ92	PFAS DoD ICC	LZ39	-	-	230210-07
LZ92	PFAS DoD ICC	LZ39	-	-	230210-08
LZ91	PFAS DoD Instrument Blank	LW18	-	-	220124-04
LZ91	PFAS DoD Instrument Blank	LW18	-	-	230124-01
LZ91	PFAS DoD Instrument Blank	LW18	-	-	230124-05
LZ91	PFAS DoD Instrument Blank	LW18	-	-	230124-06
LZ91	PFAS DoD Instrument Blank	LW18	-	-	230124-09
LZ91	PFAS DoD Instrument Blank	LX92	-	-	230306-08
LZ91	PFAS DoD Instrument Blank	LX92	-	-	230306-09
LZ91	PFAS DoD Instrument Blank	LX92	-	-	230306-10
LZ91	PFAS DoD Instrument Blank	LX92	-	-	230306-11
LZ91	PFAS DoD Instrument Blank	LX92	-	-	230306-12
LZ91	PFAS DoD Instrument Blank	LX92	-	-	230306-13
LZ91	PFAS DoD Instrument Blank	LX92	-	-	230306-14
LZ91	PFAS DoD Instrument Blank	LX92	-	-	230306-15
LZ91	PFAS DoD Instrument Blank	LX92	-	-	230306-16
LZ91	PFAS DoD Instrument Blank	LX92	-	-	230306-17
LZ91	PFAS DoD Instrument Blank	LX92	-	-	230306-18
LZ91	PFAS DoD Instrument Blank	LX92	-	-	230306-19
LZ91	PFAS DoD Instrument Blank	LX92	-	-	230306-20
LZ91	PFAS DoD Instrument Blank	LX92	-	-	230306-24
LZ91	PFAS DoD Instrument Blank	LZ07	-	-	220728-19
LZ91	PFAS DoD Instrument Blank	LZ07	-	-	230306-07
LZ91	PFAS DoD Instrument Blank	LZ07	-	-	230714-01

Battelle Standard ID	Description	Intermediate Solutions			Battelle Reagent ID (purchased solutions)
LZ91	PFAS DoD Instrument Blank	LZ07	-	-	230714-02
LZ91	PFAS DoD Instrument Blank	LZ39	-	-	230210-03
LZ91	PFAS DoD Instrument Blank	LZ39	-	-	230210-04
LZ91	PFAS DoD Instrument Blank	LZ39	-	-	230210-05
LZ91	PFAS DoD Instrument Blank	LZ39	-	-	230210-06
LZ91	PFAS DoD Instrument Blank	LZ39	-	-	230210-07
LZ91	PFAS DoD Instrument Blank	LZ39	-	-	230210-08