DRAFT FINAL
EXPANDED SITE INSPECTION REPORT FOR PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS) AT THE BURLINGTON AIR NATIONAL GUARD BASE
SOUTH BURLINGTON, VERMONT

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Acronyms and Abbreviations

%	Percent
AASF	Army Aviation Support Facility
AFFF	Aqueous Film Forming Foam
ANG	Air National Guard
ANGB	Air National Guard Base
AOC	Area of Concern
ARNG	Army National Guard
bgs	below ground surface
BTV	Burlington International Airport code
C6	Six Carbon Based…
C8	Eight Carbon Based…
CERCLA	Comprehensive Environmental Response, Compensation, and Recovery Act
CIP	Community Involvement Plan
ESI	Expanded Site Inspection
ft	foot/feet
FTA	Fire Training Area
GSA	General Services Administration
IDW	Investigation Derived Waste
IRP	Installation Restoration Program
J	a data validation qualifier
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ng/g	nanograms per gram
ng/L	nanograms per liter
NGB/A4VR	Restoration Branch, Operations Division, Logistics and Installations Directorate, Air National Guard Readiness Center
OASIS	One Acquisition Solution for Integrated Services
PA	Preliminary Assessment
PAL	Project Action Limit
PFAS	Per- and Polyfluoroalkyl Substances
PFBS	Perfluorobutanesulfonic Acid
PFHpA	Perfluoroheptanoic Acid
PFHxS	Perfluorohexane Sulfonic Acid
PFNA	Perfluorononanoic Acid
PFOA	Perfluorooctanoic Acid
PFOS	Perfluorooctane Sulfonate
pH	potential of hydrogen
PID	Photoionization Detector

Acronyms and Abbreviations (Continued)

PVC	polyvinyl chloride
QAPP	Quality Assurance Project Plan
SI	Site Inspection
TOC	total organic carbon
UFP	Unified Federal Policy
US	United States
USAF	United States Air Force
USEPA	United States Environmental Protection Agency
VT	Vermont
VTANG	Vermont Air National Guard
VTDEC	Vermont Department of Environmental Conservation

SECTION 1.0 Introduction

This Expanded Site Inspection (ESI) was performed to investigate per- and polyfluoroalkyl substances (PFAS) in soil, groundwater, surface water, sediment, and stormwater at the Burlington Air National Guard Base (ANGB) located in South Burlington, Vermont (VT) in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process. Parsons was contracted by the Restoration Branch, Operations Division, Logistics and Installations Directorate, Air National Guard Readiness Center (NGB/A4VR) under the United States (US) General Services Administration (GSA) One Acquisition Solution for Integrated Services (OASIS) Pool 1 contract number GS00Q14OA DU127, delivery order W9133L-18-F-0052, to perform the ESI at Burlington ANGB. The Vermont Department of Environmental Conservation (VTDEC) is the regulatory authority for the ESI activities at the Burlington ANGB.

The ESI was conducted between May and August 2019 in accordance with the procedures specified in the ESI Work Plan (Parsons, 2019), except for the deviations noted in Section 2.8. This ESI Report describes the objectives and activities completed for the investigation and presents the results and findings collected during the course of the investigation. The location of Burlington ANGB is shown on Figure 1.

A Community Involvement Plan (CIP) has been prepared for Vermont Air National Guard (VTANG) (CH2M HILL, 2018). The CIP is designed to facilitate communication between the Base and the communities adjacent to the Base regarding its environmental cleanup program. The Base will use the activities outlined in the CIP as a guideline to keep residents informed of Base environmental conditions. Public outreach regarding the ESI will follow the protocol identified in the CIP.

1.1 BACKGROUND

Burlington ANGB is in western Chittenden County in South Burlington, VT, adjacent to the Burlington International Airport (airport code: BTV). The Base occupies approximately 281 acres of the 942-acre airport property and is 1.5 miles east of the Burlington city limits, 3.5 miles east of Lake Champlain, and approximately 0.25 miles southwest of the Winooski River. Burlington International Airport is to the south and west of the Base, residential neighborhoods and light industrial businesses are to the north, and agricultural farmland and the Winooski River are to the north and east. The Base supports the operation and maintenance of the 158th Fighter Wing and houses aircraft, support personnel, vehicles, and equipment. VTANG fire and rescue units support both military and civilian aircraft incidents as well as mutual aid response requests from surrounding fire departments.

PFAS are compounds used in the formulation of eight carbon based (C8) Aqueous Film Forming Foam (AFFF), which was used by the United States Air Force (USAF) and the Air National Guard (ANG) to extinguish petroleum fires starting from approximately 1970. Long-chain PFAS used in C8 AFFF, specifically perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS), are recognized as persistent, bioaccumulative, and toxic (ITRC, 2018b). The last known discharge of C8 AFFF at

Burlington ANGB was in July 2015 when approximately ½ gallon of C8 AFFF was released during transfer of C8 AFFF at Building 60 Current Fire Station (AOC 3). C8 AFFF at the Burlington ANGB has been removed, properly disposed of, and replaced with short-chain six carbon based (C6) AFFF, approved under the U.S. EPA's Stewardship Program. C6 PFAS are currently considered lower in toxicity and have significantly reduced bioaccumulation potential compared to C8 PFAS (ITRC, 2018b and USEPA, 2019).

The NGB/A4VR performed a Preliminary Assessment (PA) (CH2M HILL, 2015) and Site Inspection (SI) (Aerostar SES, 2018) at the Burlington ANGB in accordance with the CERCLA process for PFAS in soil, surface water, sediment, and groundwater. The United States Environmental Protection Agency (USEPA) identifies the SI as the on-site investigation to determine what hazardous substances are present and if they are being released to the environment. The previous SI activities were confined to five previously identified areas, now called Areas of Concern (AOCs) 1 through 5, on or near Base (Figure 1). The SI recommended additional investigation at the five AOCs (Aerostar SES, 2018). Therefore, the ESI was conducted to augment the data collected in the SI and determine if there are off-Base upgradient sources and/or downgradient impacts to off-Base receptors.

In addition, a sixth AOC (AOC 6) was added to the ESI to investigate the location of a Cessna private plane crash which occurred in 1988 on land currently occupied by the neighboring Army National Guard (ARNG) Army Aviation Support Facility (AASF) (Figure 1). AFFF was used to extinguish the crash flames, and the PA for the AASF recommended the site proceed to SI (Army National Guard, 2019).

1.2 SCOPE AND OBJECTIVES

The AOCs investigated for the ESI included:

- AOC 1 -- Former Fire Training Area (FTA) 1 (Installation Restoration Program [IRP] Site 1)
- AOC 2 – Building 90 Former Fire Station
- AOC 3 -- Building 60 Current Fire Station
- AOC 4 -- Fire Department Equipment Testing Area
- AOC 5 -- F-16 Emergency Response Site
- AOC 6 -- Cessna Crash Response Site

ESI activities were conducted for the following objectives:

1. Confirm and further assess the presence of PFAS in all media, including:
   - Soils impacts at AOC 1;
   - Groundwater at and downgradient from retained AOCs, downgradient of Burlington ANGB, and in background/control wells upgradient of Burlington ANGB;
   - Sediment, stormwater, and surface water on Base downstream of retained AOCs, and downgradient from the Base boundary, including the Winooski River.
2. Perform a receptor survey.

3. Assess potential migration pathways of PFAS-contaminated groundwater from Burlington ANGB to offsite receptors including private wells and the Winooski River.

The ESI sampling summary for each AOC is presented in Table 1. Sample location overview maps including sample locations for both the SI (Aerostar SES, 2018) and ESI are presented as Figures 2, 3, and 4. Figure 2 shows the soil and sediment sample locations, Figure 3 shows the groundwater sample locations, and Figure 4 shows the surface water and stormwater sample locations. The scope of the ESI included the following tasks:

- Advancement of two soil borings to the water table at AOC 1 and collection of two soil samples from each boring;
- Installation of 19 permanent monitoring wells to collect groundwater samples at locations upgradient and downgradient of the AOCs;
- Redevelopment and groundwater sampling at 19 existing monitoring wells and one private water well used for agricultural purposes;
- Collection of 13 sediment and 27 surface water samples downgradient of the AOCs and additional collection of surface water samples downgradient and upgradient of the base;
- Collection of nine stormwater samples downgradient of the AOCs;
- Inspection of three storm sewer lines at the northeast boundary of the Base;
- Slug testing of select newly installed monitoring wells; and
- Performance of a receptor survey.

1.3 ENVIRONMENTAL SETTING

The following sections summarize the environmental setting of Burlington ANGB, specifically the surface water drainage, geology, and hydrogeology.

1.3.1 SURFACE WATER DRAINAGE

Surface water drainage at Burlington ANGB occurs through numerous streams along the western and northern boundaries of the Burlington International Airport with predominant drainage northward to the Winooski River, as shown on Figure 1. Muddy Brook flows toward the north along the eastern boundary of the airport toward the Winooski River. Allen Brook is located slightly further east from the Base and combines with Muddy Brook prior to discharge into the Winooski River. Intermittent drainages may seasonally flow along the eastern airport boundary with discharge toward the Winooski River (ASL, 2017). The PA (CH2M HILL, 2015) indicated surface water from each of the five AOCs ultimately discharges north toward the Winooski River. There are also a series of groundwater seeps along the escarpment north of National Guard Avenue (formerly Poor Farm Road). During the ESI, seeps were observed on the private property northwest of AOC 1 and on the portion of Base property northeast of AOC 1 near the Winooski River.

The Winooski River empties into Lake Champlain, approximately 16 river miles downstream (i.e., west) of the northwestern end of the Base. Although Lake Champlain is the primary source of drinking water

for the Base and surrounding areas, there are no surface water intakes within 15 river miles downstream of the Base (Aerostar SES, 2018).

1.3.2 GEOLOGY

The Base lies within the Champlain Lowland Physiographic Province (Champlain Lowland). The Champlain Lowland consists of a north-to-south-trending structural trough between the Green Mountains to the east, the Adirondack Mountains to the west, and the Taconic Mountains to the southeast. The Champlain Lowland is 12 to 15 miles wide between the Green and Adirondack Mountains.

The Base is located on the axis of the southward-plunging Hinesburg synclinorium, approximately three miles west of the Hinesburg-Oak Hill thrust fault. It is underlain by limestones, dolostones, and marbles of the lower Ordovician-age Beekmantown Group. Bedrock in the northwest portion of the Base property, where AOC 1 is located, was described as fractured marble bedrock of the Bascorn Formation. The bedrock surface beneath the Base is reportedly irregular and slopes to the south-southwest. The PA (CH2M HILL, 2015) reported depth to bedrock ranges from surface outcrops (off-Base, north of National Guard Avenue) to greater than 200 feet below ground surface (ft bgs) (along the flight line). On the AASF property to the northwest of the Base, surface outcrops of bedrock were observed and shallow bedrock (less than 10 ft bgs) was encountered during ESI drilling. In addition, shallow bedrock (less than 15 ft bgs) was encountered during ESI drilling on private property north of the Base.

1.3.3 HYDROGEOLOGY

The uppermost water-bearing zone at Burlington ANGB occurs under unconfined (water table) conditions in deltaic glaciofluvial sands and silts (Aerostar SES, 2018). This surficial water-bearing zone is underlain by a potentially confining to semi-confining lacustrine clay layer present across much of the Base. A second deeper water bearing zone occurs within glacial till and the underlying limestone and marble bedrock of the Ordovician Bascom Formation bedrock. The low permeability clay aquitard that separates the water bearing zones is discontinuous and is absent under the flight line in the vicinity of AOC 5 and to the northwest past AOC 6. This low permeability unit is present at significant thickness (10 to 30 feet) beneath AOCs 1, 2, 3, and 4 and likely serves as a barrier to vertical migration in the main Burlington ANGB area.

The vertical hydraulic gradient at the Base is generally downward, and the till/bedrock aquifer appears to be connected hydraulically to the overlying surficial aquifer, particularly in areas where the surficial clay layer is absent. Shallow groundwater generally flows to the northeast toward (and may discharge to) the Winooski River (Roy F. Weston, Inc., 1986; Earth Technology, 1991; HAZWRAP, 1997; Parsons, 2002; CH2M HILL, 2010; ANG, 2011). Previous slug testing conducted at IRP Site 1 (AOC 1) has indicated hydraulic conductivities ranging from 0.056 feet per day (Earth Technology, 1991) to 7.87 feet per day (Parsons, 2002). Depths to groundwater in overburden wells vary from less than 5 ft bgs to more than 60 ft bgs (CH2M HILL, 2010).

Generally consistent with historical data, ESI groundwater elevation data confirms that shallow groundwater flow is generally towards the northeast; however, there is a north-northwestern flow component to the northwest of AOC 1. In addition, shallow groundwater at AASF (AOC 6) flows towards the east. ESI monitoring well specifications are summarized in Table 2. Groundwater elevation data is summarized in Table 3. A map depicting the shallow groundwater elevation contours and shallow groundwater flow direction is presented in Figure 5.

Bedrock groundwater primarily occurs within the carbonate dissolution features and faults and fractures in the marble. Local bedrock wells have water yields ranging from 6 to 40 gallons per minute (CH2M HILL, 2015). The Vermont Department of Water Resources has classified the bedrock groundwater in the area of the Base as Class III water resource. A Class III groundwater aquifer is suitable for domestic water supply, irrigation, agricultural use, and general industrial and commercial use. The Base and surrounding areas purchase potable water from the Champlain Water District, which obtains its public water supply from Lake Champlain. There are no groundwater supply wells on the Base; however, there are six private bedrock wells within an approximate 1-mile radius of the center of the Base.

1.4 PROJECT ACTION LIMITS

Screening criteria for assessing data, i.e. Project Action Limits (PALs), were established during the PFAS SI (Aerostar SES, 2018) and remain unchanged for the ESI. The USEPA and the VTDEC have not developed or promulgated additional PALs since the SI was completed. The applicable PALs were developed from recent VTDEC guidance (VTDEC, 2018), are summarized below:

- Soil and Sediment
  - PFOA = 300 nanograms per gram (ng/g);
  - PFOS = 1,260 ng/g; and
  - Perfluorobutanesulfonic acid (PFBS) = 1,260,000 ng/g.
- Groundwater and Surface Water
  - PFOS = 20 nanograms per liter (ng/L);
  - PFOA = 20 ng/L;
  - Perfluorohexane sulfonic acid (PFHxS) = 20 ng/L;
  - Perfluoroheptanoic acid (PFHpA) = 20 ng/L; and
  - Perfluorononanoic acid (PFNA) = 20 ng/L.

The Groundwater Enforcement Standard of 20 ng/L applies to any combination of PFOA, PFOS, PFHxS, PFHpA, and PFNA (VTDEC, 2018). There are no currently promulgated screening criteria for surface water; therefore, surface water and stormwater analytical results will be compared to the Groundwater Enforcement Standard.

SECTION 2.0 Field Investigation Activities

The following subsections summarize ESI field activities. Field activities were conducted between May and August 2019 and in accordance with the procedures specified in the ESI Work Plan (Parsons, 2019), except as noted in Section 2.8. Daily Field Summary reports are provided in Appendix A.

2.1 PREPARATORY ACTIVITIES

Prior to commencement of ESI activities, drilling locations were pre-marked and details of the proposed locations were provided to Dig Safe Vermont, the one call utility notification center. In addition, on-Base utilities were cleared by the Base Civil Engineering squadron and off-Base utilities were located by a third-party private utility locator, GPRS, Inc. No significant changes were made to the proposed locations as a result of utility clearance.

Parsons obtained the following permits to conduct work within the vicinity of the Burlington International Airport, within the City of South Burlington right of way, and on adjacent properties:

- Federal Aviation Administration Form 7460-1, Notice of Proposed Construction or Alteration for temporary drilling rigs was submitted on 15 March 2019. Aeronautical Study Numbers 2019-ANE-335-NRA to 2019-ANE-344-NRA were assigned to the project, and a determination letter approving the proposed work at locations within the vicinity of the Runway and Taxiway Free Areas of the Burlington International Airport was issued on 07 June 2019.
- An application to install monitoring wells within the right of way along Country Club Drive and East Country Club Drive was submitted to the City of South Burlington. A Right-of-Way Permit was issued on 27 June 2019 by the Public Works Department.
- Right-of-Entry agreements were obtained from private landowners to allow access to their property for the ESI activities.

2.2 FIELD SAMPLING

ESI field sampling activities included soil, groundwater, surface water, sediment, and stormwater sampling and are summarized below.

2.2.1 SOIL SAMPLING

During the ESI, two soil borings were completed for the purpose of soil sample collection at AOC 1. The locations of the two soil borings, both within AOC 1, are shown on Figure 2. Although soil samples collected within AOC 1 during the SI did not exceed PALs for PFOA, PFOS, and PFBS (Aerostar SES, 2018), the additional ESI soil samples were collected and analyzed for the expanded list of PFAS constituents to determine if significant precursor substances are present. To investigate the pathway of PFAS in soil migrating to groundwater, the three soil samples with the highest PFAS concentrations were also analyzed for additional parameters.

The soil borings were advanced by Cascade Drilling using rotosonic drilling methods to a depth of 10 ft bgs. Soil borings were logged for soil lithology. Boring logs are provided in Appendix B. The AOC 1

footprint was previously excavated to a depth of approximately 3 to 4 feet during historic AOC 1 restoration activities. Two grab soil samples were collected from each boring, at separate intervals in native soils between the bottom of backfill materials and the water table. All soil samples were screened by a photoionization detector (PID) as a health and safety precaution due to the potential presence of volatile organic compounds. PID calibration logs are provided in Appendix C. Following collection of soil samples, boreholes were abandoned by backfilling the boreholes with bentonite and capping with surrounding soil.

2.2.2 MONITORING WELL INSTALLATION, WELL DEVELOPMENT, GROUNDWATER SAMPLING, AND SLUG TESTING

During the ESI, 19 monitoring wells were installed. Monitoring wells were typically installed as co-located pairs to monitor the first two unconsolidated water-bearing zones. At a few locations where shallow bedrock was encountered (less than 15 feet deep), only one shallow monitoring well was installed. The locations of the monitoring wells are shown on Figure 3 and well construction details are presented on Table 2. Monitoring well borings were advanced by Cascade Drilling using rotosonic drilling methods to depths ranging from 12 to 80 ft bgs. Soil cores were collected continuously to verify soil lithology, then inspected, logged, and field screened by a PID. Boring logs are provided in Appendix B and PID calibration logs are provided in Appendix C. Each monitoring well was constructed using two-inch diameter, schedule 40 polyvinyl chloride (PVC) riser with a 10-ft long or 5-ft long, 0.010-inch slotted screen. Well construction details are summarized in Table 2. The monitoring wells were surveyed by Summit Engineering, Inc., a Vermont-licensed land surveyor. The monitoring well survey report is included as Appendix D.

Each monitoring well was developed using a submersible pump to surge and purge the screened interval and remove fine particles that had accumulated. In addition, 19 existing monitoring wells were redeveloped during the ESI. The locations of the existing monitoring wells are shown on Figure 3. Well development logs are provided in Appendix E. Water quality meter calibration logs are provided in Appendix C.

Groundwater samples were collected via low-flow sampling methods using peristaltic pumps with disposable PFAS-free tubing. Water levels and total well depth were measured to the nearest 0.01 inch. Groundwater elevations are summarized in Table 3. Groundwater sampling logs are provided in Appendix F. Two rounds of groundwater samples were collected between early June and mid-July 2019 from the monitoring wells: an initial round and a confirmatory round. The confirmatory groundwater sampling round was conducted following completion of the initial groundwater sampling round. The confirmatory round was conducted using sampling procedures that were identical to those used in the initial round.

Following groundwater sampling, in-situ hydraulic conductivity tests (i.e., slug tests) were performed at nine of the nineteen newly installed monitoring wells. Six of the monitoring wells (AASF06-MW02S, AASF06-MW01S, BRLTN04-MW01D, BRLTNDG-MW01S, BRLTNDG-MW02S, and BRLTNDG-MW05S) did not have sufficient water in the wells to conduct slug tests, and four of the deep wells with screens

set in clay units (BRLTNDG-MW03D, BRLTNDG-MW04D, BRLTNDG-MW05D, and BRLTNUP-MW01D) were not tested. Each slug test was conducted in accordance with the American Society for Testing and Materials D4044/D4044M-15, and results were recorded by a pressure transducer and data logger. Data interpretation was based on the methods of Bouwer and Rice (Bouwer, 1976). Slug test analysis reports are provided as Appendix G.

2.2.3 SURFACE WATER, SEDIMENT, AND STORMWATER SAMPLING

During the ESI, 13 sediment and 27 surface water samples were collected. The locations of the sediment and surface water and samples are shown on Figures 2 and 4, respectively, and detailed descriptions of the sampling locations are included with the results in Section 3. Surface water and sediment samples were collected following a minimum of 48 hours of clear weather with no significant storm events to ensure that these sample results represent ambient flow conditions. All sediment samples were collocated with a surface water sample and collected after the surface water sample. Surface water and sediment sampling logs are provided in Appendices H and I, respectively.

During the ESI, nine stormwater samples were collected. The locations of the stormwater samples are shown on Figure 4. Stormwater samples were collected within 12 hours of a storm event such that these samples represent increased flow conditions. Stormwater sampling logs are provided in Appendix J.

2.3 STORM SEWER LINE INSPECTIONS

Three storm sewer outfalls and associated piping on the northeast side of the airport runway and taxiway, in the vicinity of AOC 5, to their outfalls off-Base north of National Guard Avenue were inspected using remote camera equipment. Plastic Pipe Fabrication Inc. completed the inspection services on July 2, 2019. The storm sewer line inspection locations and catch basins used for access are shown on Figure 6. The remote camera was placed in the catch basin, and the footage counter was set to zero such that the distance from the catch basin was measured as video data was collected. Screen capture photographs were collected where damage to the piping or unique features were observed. The storm sewer line inspection report is provided as Appendix K.

2.4 DECONTAMINATION

Non-disposable sampling equipment was decontaminated between uses with Alconox® cleaning solution and rinsed with laboratory-provided PFAS-free water. All rinsate was collected in sealed containers for disposal. For groundwater sampling, the flow-through cell and any non-dedicated equipment (i.e., water-level probe, multi-parameter instrument probe) that contacted groundwater was decontaminated between uses. Larger equipment such as drill rigs were cleaned with potable water using a high-pressure washer. A source blank sample of the on-Base potable water supply was analyzed for PFAS, and results were used during the data validation process. Equipment blank samples were collected and analyzed for PFAS as prescribed in the Work Plan.

2.5 INVESTIGATION-DERIVED WASTE MANAGEMENT

Liquid Investigation Derived Waste (IDW), including drilling water, purge water, development water, and decontamination fluids, was collected and temporarily contained in 275-gallon totes. Following approval from VTDEC, water generated at on-Base locations was discharged to the ground surface at AOC 1, while water generated at off-Base locations was discharged at the point of generation. IDW soil generated from borings in the AOC 1 source area was temporarily containerized and characterized. Analytical results indicated that the AOC 1 soil IDW was below soil PALs and not a direct contact risk; therefore, the AOC 1 soil was thin spread at the source area at AOC 1. In addition, IDW soil generated from other borings on-Base were thin spread on the ground surface at AOC 1. IDW soil generated from borings at AASF was thin spread on the ground surface at AASF. IDW soil generated at off-Base borings on private property or within the City of South Burlington ROW was containerized into five drums, stored at AOC 1, and characterized for off-site disposal. IDW soil from those locations was containerized for off-site disposal because permission from the landowners to dispose of the soil cuttings at the boring locations was not requested and the Base did not want off-site soils disposed of on their leased property.

Following receipt of laboratory analytical results, five drums of soil IDW were removed from the Base on 25 September 2019 and transported to Envirosafe Services of Ohio, Inc. for final disposal at their landfill in Oregon, Ohio, a facility licensed to accept the waste. In addition, seven 275-gallons totes which temporarily held liquid IDW but could not be considered RCRA-empty due to sediment in the bottom of the containers were disposed of at the same time. Copies of the waste manifest and certificate of disposal are presented in Appendix L.

2.6 LABORATORY ANALYSES

Samples were submitted to Eurofins Lancaster Laboratories Environmental in Lancaster, Pennsylvania. The samples were analyzed for a total of 24 PFAS target analytes via USEPA method 537 (Modified). The 24 target analytes were chosen based on the PFAS compounds included in the USEPA draft target analyte list (USEPA, 2018). In addition, three soil samples were analyzed for cations (calcium, iron, manganese, potassium), anions (chloride and sulfate), TOC, and pH. Laboratory analytical reports are provided as Appendix M.

2.7 DATA VALIDATION AND USABILITY

Data validation was performed as defined in the Unified Federal Policy (UFP) for Quality Assurance Project Plan (QAPP) in the ESI Work Plan (Parsons, 2019). Data validation reports are included in Appendix N. The following samples were collected during the Burlington ANGB ESI sampling conducted in 2019:

- Five (5) soil samples, including 4 normal environmental samples, 1 field duplicate, and 1 Matrix Spike (MS)/ Matrix Spike Duplicate (MSD) pair;

- Fifteen (15) sediment samples, including 13 normal environmental samples, 2 field duplicates, and 1 MS/MSD pair;
- Eighty-even (87) groundwater samples, including 77 normal environmental samples, 10 field duplicates, and 6 MS/MSD pairs;
- Thirty-one (31) surface water samples, including 27 normal environmental samples, 4 field duplicates, and 2 MS/MSD pairs;
- Eleven (11) stormwater water samples, including 9 normal environmental samples, 2 field duplicates, and 1 MS/MSD pair;
- Eleven (11) equipment blanks;
- Twenty-six (26) field blanks, and
- One (1) source blank.

The results of the data quality evaluation indicate that the overall quality of the data enables its use to confirm the presence or absence of contamination. Through data verification, validation, and review, the analytical information has been qualified as appropriate. Data are considered usable if results are unqualified or qualified as estimated. Results qualified "R" as rejected are considered unusable due to serious deficiencies in quality control. A total of 4,513 data points were collected for this data set. Of those, 98 results were qualified "R" as rejected and unusable. The majority of the data rejected was due to extremely high or extremely low External Injection Standard recoveries during laboratory analysis. Therefore, 97.8 percent (%) of the data were considered usable for the purposes of this project, which meets the minimum criteria of 90%. The overall quality of the data meets or exceeds the established project objectives.

2.8 DEVIATIONS FROM THE WORK PLAN

Deviations from the Final Work Plan (Parsons, 2019) included the following:

- The ESI investigation was designed to be conducted using Triad tenets wherein data would be collected using rapid turn analysis and decisions would be made in the field using historical and newly collected data. However, during the course of the investigation, the laboratory could not achieve rapid turn data delivery requirements, necessitating adoption of a binary decision-making approach. The revised process involved collecting most of the proposed samples, analyzing the results, then placing contingency locations for additional sampling.
- The location for shallow groundwater monitoring well AASF06-MW02S was shifted approximately 200 feet to the northeast due to refusal on shallow bedrock (less than 5 ft bgs) at the originally proposed location, and deep groundwater monitoring well AASF06-MW02D was removed from the ESI program due to shallow bedrock (at approximately 15 ft bgs) at the new location.
- Proposed groundwater monitoring pairs BRLTNUP-MW02S/D and BRLTN05-MW01S/D were eliminated from the ESI program due to lack of right-of-entry agreement with the Burlington International Airport. An additional off-site downgradient well pair (BRLTNDG-MW05S/D) was added to the program instead.

- Based on input from the VTDEC regulator, the well development standard operating procedure was revised such that three times the volume of water added during drilling within the vertical interval that starts at the top of the sand pack and ends at the bottom of the screen was removed during development followed by removal of a maximum of three well volumes.
- Existing monitoring well MCW109 was eliminated from the well development and groundwater sampling program because it was dry.
- Existing monitoring well V1-BR-06 was eliminated from the sampling program due to lack of recharge after well development attempts.
- Due to the low-yielding nature of the formation at new monitoring well AASF06-MW01S, water quality parameters were not be measured in the field prior to sample collection for laboratory analysis.
- The second confirmatory sample from existing monitoring well V1-BR-08 was not collected. This well has damaged/crooked casing and the water level dropped below the end of the peristaltic pump tubing before stable parameters were able to be achieved.
- The location for proposed surface water and sediment samples at BRLTNDG-007-SW/SD was inaccessible and those samples were not collected.
- Stormwater samples could not be collected at eight proposed stormwater sample locations (AASFDG-001-ST, BRLTNDG-002-ST, BRLTNDG-005-ST, BRLTNDG-008-ST, BRLTNDG-009-ST, BRLTNDG-010-ST, BRLTNDG-013-ST, and BRLTNDG-015-ST) because stormwater was not present at those locations during storm events over the course of the fieldwork.
- As described in Section 2.5, liquid IDW was discharged to the ground surface with VTDEC and ANG approval.

SECTION 3.0 Field Investigation Results

This section presents the soil, groundwater, sediment, surface water, and stormwater analytical data generated during the ESI field activities along with results from slug testing, storm sewer line inspection, and the receptor survey.

3.1 ANALYTICAL RESULTS

The laboratory analytical results were compared to the corresponding PALs summarized in Section 1.4. Soil analytical results for the standard analytical procedures are summarized in Table 4. Groundwater analytical results are summarized in Table 5, surface water analytical results are summarized in Table 6, sediment analytical results are summarized in Table 7, and stormwater analytical results are summarized in Table 8. Figure 7 presents the soil and sediment analytical results from both the SI (Aerostar SES, 2018) and ESI. Figures 8 through 14 present the groundwater analytical results from both the SI (Aerostar SES, 2018) and ESI by AOC and the eastern downgradient area. Figure 15 presents the surface water and stormwater analytical results from both the SI (Aerostar SES, 2018) and ESI, and Figure 16 presents the stormwater analytical results specifically from the SI and ESI.

3.1.1 SOIL

Soil samples were collected from two borings at AOC 1, BRLTN01-003-SO and BRLTN01-004-SO, shown on Figure 7. Soil analytical results presented on Table 4 and Figure 7 indicate low-level detections of various PFAS compounds in every sample; however, PFBS, PFOA, and PFOS were not detected above the PAL in the AOC 1 samples. In addition, soil analytical samples indicate that PFBS, PFOA, and PFOS were not detected above the PAL in any sample collected at the Base during the SI (Aerostar SES, 2018) and ESI.

In addition, the three soil samples from BRLTN01-003-SO and BRLTN01-004-SO with the highest PFAS concentrations were also analyzed for cations (calcium, iron, manganese, potassium), anions (chloride and sulfate), TOC, and pH. Results of those analyzes are shown on Table 4.

3.1.2 GROUNDWATER

Groundwater samples were collected from 39 locations both on-Base and off-Base during the ESI, including newly installed monitoring wells, existing monitoring wells, and one private well. The following paragraphs describe the analytical results upgradient, at, and downgradient of the AOCs. Groundwater analytical results are summarized in Table 5 and Figures 8 through 14 present the groundwater analytical results from both the SI (Aerostar SES, 2018) and ESI by AOC and the eastern downgradient area.

Groundwater samples were collected from two wells, one shallow (BTV-MW-5) and one deep (BRLTNUP-MW01D), at the base boundary upgradient of AOCs 1, 2, 3, and 4. Both wells are located approximately 400 feet upgradient of AOC 4, as shown on Figure 11. Groundwater analytical results

indicate that the combined sum of PFHpA, PFHxS, PFNA, PFOA, and PFOS during the confirmatory sampling round was 220.5 J (J is a data validation qualifier that indicates the results is estimated) ng/L in the shallow well BTV-MW-5 and 29.87 J ng/L in the deep well BRLTNUP-MW01D. Results from both upgradient wells were above the groundwater PAL.

Additional upgradient groundwater wells proposed to be installed upgradient of AOC 5 were eliminated from the ESI program due to lack of right-of-entry agreement with the Burlington International Airport.

Analytical results from groundwater wells on-Base and at AASF indicate that the AOCs can be categorized as either a primary source area (PFAS groundwater contamination greater than two orders of magnitude above PALs) or a secondary source area (PFAS groundwater contamination exceeds PALs and concentrations are less than two orders of magnitude above PALs). Primary source areas include AOC 1 (Former FTA 1 [IRP Site 1]), AOC 2 (Building 90 Former Fire Station), AOC 3 (Building 60 Current Fire Station), and AOC 4 (Fire Department Equipment Testing Area). Secondary source areas include AOC 5 (F-16 Emergency Response Site) and AOC 6 (Cessna Crash Response Site).

At AOC 1, the combined sum of PFHpA, PFHxS, PFNA, PFOA, and PFOS exceeded the PAL for all samples collected from wells, both shallow and deep, associated with the AOC except for shallow well BTV-MW-14 located upgradient to the southwest of AOC 1. During the ESI, the highest concentration of PFHpA, PFHxS, PFNA, PFOA, and PFOS was 49,413 J ng/L in shallow well V1-MW12, approximately 200 feet north of AOC 1. At AOC 1, groundwater impacts were also observed in deep wells, with a maximum PFHpA, PFHxS, PFNA, PFOA, and PFOS combined concentration of 19,521 J ng/L at V1-BR-08, the deep well paired with V1-MW12.

At AOC 2, the combined sum of PFHpA, PFHxS, PFNA, PFOA, and PFOS exceeded the PAL for all samples collected from wells associated with the AOC, except for one deep well approximately 1,600 feet downgradient of the AOC (V4-MW414). During the ESI, the highest combined concentration of PFHpA, PFHxS, PFNA, PFOA, and PFOS was 30,430 ng/L in shallow well BRLTN02-MW01S, approximately 40 feet downgradient of the AOC. At AOC 2, groundwater impacts were also observed in the deep well installed immediate downgradient of the AOC, BRLTN02-MW01D, with a PFHpA, PFHxS, PFNA, PFOA, and PFOS combined concentration of 448 ng/L.

At AOC 3, the combined sum of PFHpA, PFHxS, PFNA, PFOA, and PFOS exceeded the PAL for the shallow SI samples (Aerostar SES, 2018) and the ESI-installed shallow well, BRLTN03-MW01S, but not for the paired deep well, BRLTN03-MW01D. During the ESI, the highest combined concentration of PFHpA, PFHxS, PFNA, PFOA, and PFOS was 41,277 ng/L in shallow well BRLTN03-MW01S, approximately 90 feet downgradient of the AOC.

At AOC 4, the combined sum of PFHpA, PFHxS, PFNA, PFOA, and PFOS exceeded the PAL for the shallow SI samples (Aerostar SES, 2018) and the ESI-installed shallow well, BRLTN04-MW01S, but not for the paired deep well, BRLTN04-MW01D. During the ESI, the highest combined concentration of PFHpA, PFHxS, PFNA, PFOA, and PFOS was 9,378 ng/L in shallow well BRLTN03-MW01S, approximately 60 feet downgradient of the AOC.

At AOC 5, the combined sum of PFHpA, PFHxS, PFNA, PFOA, and PFOS exceeded the PAL for the shallow SI samples (Aerostar SES, 2018) at a maximum concentration of 407.7 ng/L at BRLTN05-001-GW. Results of groundwater samples from downgradient wells, both shallow (BRLTNDG-MW01S and BTV-MW-9) and deep (BRLTNDG-MW01D), sampled during the ESI also indicated the combined sum of PFHpA, PFHxS, PFNA, PFOA, and PFOS exceeded the PAL. During the ESI, the highest combined concentration of PFHpA, PFHxS, PFNA, PFOA, and PFOS was 197.1 ng/L in shallow well BRLTNDG-MW01S, approximately 850 feet downgradient of the AOC. At the paired deep well, BRLTNDG-MW01D, the combined sum of PFHpA, PFHxS, PFNA, PFOA, and PFOS was 31.5 ng/L.

At AOC 6, the combined sum of PFHpA, PFHxS, PFNA, PFOA, and PFOS exceeded the PAL at two of the three shallow monitoring wells installed during the ESI. The combined sum of PFHpA, PFHxS, PFNA, PFOA, and PFOS was below the PAL at well AASF06-MW02S, which is located hydraulically cross-gradient to the AOC. The highest combined concentration of PFHpA, PFHxS, PFNA, PFOA, and PFOS was 154.1 ng/L in shallow well AASF06-MW03S, approximately 480 feet downgradient of the AOC.

Seven new monitoring wells were installed off-Base hydraulically downgradient of AOC 1, as shown on Figure 8. In addition, samples were collected at Well 59, a private water well used for agricultural purposes hydraulically downgradient of the base. The combined sum of PFHpA, PFHxS, PFNA, PFOA, and PFOS exceeded the PAL at all wells off-Base, except for two deep overburden wells BRLTNDG-MW04D and BRLTNDG-MW05D. The highest combined concentration of PFHpA, PFHxS, PFNA, PFOA, and PFOS detected off-Base was 257.03 J ng/L at Well 59, which is a deep bedrock well.

3.1.3 SURFACE WATER

Surface water samples were collected from 27 locations both on-Base and off-Base during the ESI, including from surface water drainage gullies, seeps, Allen Brook, Muddy Brook, and the Winooski River. The following paragraphs describe the analytical results at upgradient and downgradient of the AOCs. Surface water analytical results are summarized in Table 6 and Figure 15 presents the groundwater analytical results from both the SI (Aerostar SES, 2018) and ESI. There are no currently promulgated screening criteria for surface water; therefore, surface water analytical results are compared to the Groundwater Enforcement Standard.

Surface water samples were collected from five locations considered upgradient of surface water flow at the Base, as shown on Figure 15. Two locations were within Muddy Brook east of the Base, one location was within Allen Brook east of the Base, and two locations were within the Winooski River east of the Base. Results from each surface water sample were below the surface water PAL except for BRLTNUP-005-SW. The analytical results for BRLTNUP-005-SW indicate that the combined sum of PFHpA, PFHxS, PFNA, PFOA, and PFOS was 29.33 J ng/L. BRLTNUP-005-SW was collected along the bank of the Winooski River, just downstream from the confluence with Muddy Brook and upstream of surface water inputs sourced from Burlington ANGB.

Samples collected downgradient of the AOCs were collected from three primary areas: 1) surface water drainage gullies and seeps located on-Base (BRLTNDG-001-SW, BRLTNDG-003-SW, BRLTNDG-004-

SW, BRLTNDG-005-SW, BRLTNDG-006-SW, BRLTNDG-008-SW), 2) surface water drainage gullies and seeps located off-Base (BRLTNDG-009-SW, BRLTNDG-010-SW, BRLTNDG-011-SW, BRLTNDG-012-SW, BRLTNDG-013-SW, BRLTNDG-019-SW, BRLTNDG-020-SW, BRLTNDG-021-SW, BRLTNDG-022-SW, and BRLTNDG-023-SW), and 3) the Winooski River (BRLTNDG-002-SW, BRLTNDG-014-SW, BRLTNDG-015-SW, BRLTNDG-016-SW, BRLTNDG-017-SW, and BRLTNDG-018-SW). The combined sum of PFHpA, PFHxS, PFNA, PFOA, and PFOS exceeded the PAL for all samples collected from surface water gullies and seeps located both on-Base and off-Base. The highest combined concentration of PFHpA, PFHxS, PFNA, PFOA, and PFOS was 13,406 J ng/L, detected in sample BRLTNDG-008-SW collected at a surface water drainage gully approximately 400 feet downgradient from AOC 1. For the Winooski River samples, the combined sum of PFHpA, PFHxS, PFNA, PFOA, and PFOS at two of the six locations exceeded the PAL, BRLTNDG-002-SW at 549.4 J ng/L and BRLTNDG-014-SW at 301.1 J ng/L. Samples at both of these locations were collected where surface water inputs from the Base mix with the Winooski River. Sample BRLTNDG-015-SW was collected on the opposite bank of the Winooski River, halfway between the locations of BRLTNDG-002-SW and BRLTNDG-014-SW. The combined sum of PFHpA, PFHxS, PFNA, PFOA, and PFOS was 1.28 J ng/L in sample BRLTNDG-015-SW, well below the PAL of 20 ng/L. Analytical results for Winooski River samples collected downstream of the Base on the Base side of the river (BRLTNDG-016-SW, BRLTNDG-017-SW, and BRLTNDG-018-SW) indicated the combined sum of PFHpA, PFHxS, PFNA, PFOA, and PFOS were below the PAL.

3.1.4 SEDIMENT

Sediment samples were collected at thirteen locations during the ESI. Locations included surface water features and seeps on-Base and off-Base and from the banks of the Winooski River adjacent to the Base. Sediment analytical results presented on Table 7 and Figure 7 indicate low-level detections of various PFAS compounds in every sample; however, PFBS, PFOA, and PFOS were not detected above the PAL in any of the AOC 1 samples. In addition, sediment analytical samples indicate that PFBS, PFOA, and PFOS were not detected above the PAL in any sample collected at the Base during the SI (Aerostar SES, 2018) and ESI.

3.1.5 STORMWATER

Stormwater samples were collected at nine locations during the ESI within 12 hours of a storm event such that these samples represent increased flow conditions. Locations included stormwater system discharge piping and outfalls both on-Base and off-Base. Stormwater analytical results are presented on Table 8 and Figures 15 (surface water and stormwater samples) and 16 (stormwater samples only). There are no currently promulgated screening criteria for stormwater; therefore, stormwater analytical results are compared to the Groundwater Enforcement Standard.

Analytical results indicate detections of various PFAS compounds in every sample; however, samples from only four of the nine samples exceeded PALs. The maximum concentration of the combined sum of PFHpA, PFHxS, PFNA, PFOA, and PFOS was 2,170 ng/L measured in the field duplicate at BRLTNDG-014-DG. This location is a storm sewer outfall, Outfall NG001-P shown on Figure 6, that was observed to be continuously discharging water, even when no precipitation event had recently occurred. It is

likely that water discharging from this outfall consists of groundwater that is infiltrating into the stormwater management system. The other three locations with a combined sum of PFHpA, PFHxS, PFNA, PFOA, and PFOS greater than the PAL include BRLTNDG-001-ST (102.56 J ng/L) and BRLTNDG-003-ST (34.46 J ng/L) both within a drainage feature downgradient of AOC 2 and BRLTNDG-012-ST at 251.81 J ng/L located at an outfall immediately downgradient of AOC 3.

3.2 PFAS PROPORTIONAL ANALYSIS

Radar charts were prepared to illustrate concentrations and proportions of various PFAS compounds in groundwater and surface water at select sample locations. The proportional analysis provided by radar charts can be used to identify distinct combinations of PFAS mixtures at each sample location. Radar charts for select groundwater samples are shown on Figure 17, and radar charts for select surface water samples are shown on Figure 18.

The primary source areas at Burlington ANGB, the AOCs with a history of routine AFFF storage, handling, or use, exhibit a "type signature" dominated by PFOS, minor other sulfonates (PFHxS and PFBS), and the fluorotelomer sulfonate (6:2 FtS). This signature is illustrated in samples from groundwater monitoring wells V1-MW1 (AOC 1 – Former FTA 1), BRLTN02-MW01S (AOC 2 – Building 90 former Fire Station), BRLTN03-MW-01S (AOC 3 – Building 60 Current Fire Station), and BRLTN04-MW-01S (AOC 4 – Fire Department Equipment Testing Area). Concentrations and proportions of PFAS in groundwater can change as migration occurs through a porous medium due to differential sorption. For instance, PFOS (8-carbon sulfonate) is more sorptive than PFHxS (6-carbon sulfonate), which is more sorptive than PFBS (4-carbon sulfonate), resulting in fractionation, or changing proportions of concentrations along the flow direction. This is illustrated by a sequence of radar diagrams and relative proportion bar chart along the flow path: V1-MW1, V1-RFW2, V1-MW14, and V1-MW-107 which indicates declining total concentration with increasing proportions of PFHxS, PFOA, and PFHxA along the flow path, as illustrated on Figure 19.

Peripheral and upgradient groundwater monitoring locations at Burlington ANGB exhibit a different PFAS signature than the AFFF "type signature" associated with monitoring wells proximate to the primary source area AOCs where AFFF was routinely stored, handled, or used. PFAS signatures associated with these peripheral and upgradient monitoring wells are dominated by PFBA, a 4-carbon carboxylate, which is known to be released to the air from landfills (ITRC, 2018a). Monitoring wells with the strong PFBA signatures include AASF06-MW02S and BTV-MW-5, both located upgradient or cross-gradient to the primary source area AOCs.

The distal, downgradient, and off-site groundwater sample locations BRLTNDG-MW04S and BRLTNDG-MW05S exhibit proportions of the perfluorosulfonates combined with a dominant PFBA signature. In addition, some surface water sample locations show an AFFF "type signature" combined with a dominant PFBA signature, as particularly demonstrated in the radar charts for BRLTNUP-005-SW and BRLTNDG-014-SW collected from the Winooski River.

A summary of this analysis is provided as follows:

- Primary source AOCs with history of routine AFFF storage, handling, or use exhibit a characteristic PFAS signature dominated by PFOS at relatively elevated concentrations.
- Changing proportions of PFAS (especially PFOS, PFHxS, PFBS, and PFOA) along the downgradient groundwater flow path from AOC 1 indicate transport of PFAS by advective flow and associated differential sorption in porous media. This can modify the PFAS signature in the downgradient direction through fractionation.
- The PFOS signature attributed to AFFF storage, handling, or use appears to be superimposed on an ambient PFAS signature characterized by PFBA, which appears to be attributable to an upgradient source.
- Most distal, downgradient, and off-site monitoring wells and some surface water samples reflect an AFFF "type signature" combined with a dominant PFBA signature, indicating multiple possible PFAS sources.

3.3 SLUG TESTING RESULTS

Table 9 presents the results of the slug testing. The groundwater velocities calculated from slug test hydraulic conductivities ranged from 0.1 to 6.43 feet per day. The geometric mean of the slug test derived velocities was 1.43 feet per day. These results are within the range of hydraulic conductivities previously reported for the Base (Section 1.3.3) (Earth Technology, 1991; Parsons, 2002).

3.4 STORM SEWER LINE INSPECTION

The storm sewer line inspection locations and catch basins used for access are shown on Figure 6. The storm sewer line inspection report is provided as Appendix K. During the storm sewer line inspection, screen capture photographs were collected where damage to the piping or unique features were observed, and those locations are shown on Figure 6. Downgradient from catch basin S6.007, six locations were identified as having offset joints, deformed pipes, or areas of standing water. Downgradient from catch basin S6.009, one location was identified as having a deformed pipe. Downgradient from catch basin S6.017 to Outfall NG001-P, no damage to the piping was noted; however, continuously flowing water was observed in the pipe although weather conditions were dry at the time. At catch basin S6.018, three pipes were observed. One of the pipes was connected to catch basin S6.017, and continuously flowing water was observed in this pipe. The second two pipes both ended in an infiltration gallery containing water up to the invert of the discharge pipes, into which water was continuously discharging. The continuously flowing water flows from the infiltration gallery to catch basin S6.018 and to catch basin S6.017 before eventually discharging to Outfall NG001-P on the north side of National Guard Ave. The water then flows into two surface water ditches on private property north of the Base. A portion of the flow travels east-northeast in a surface water ditch onto the private farm north of the Base, while the other portion of the flow travels northwest in the unnamed tributary parallel to National Guard Avenue before passing through a wetland, beneath Ethan Allen Drive, and ultimately to its confluence with the Winooski River.

3.5 RECEPTOR SURVEY

Potential receptors of concern for PFAS are off-Base and include private water wells and the Winooski River. One of the primary objectives of this ESI was to determine if there is an exposure pathway between identified ANG PFAS source areas (i.e. Base AOCs) and receptors. Exposure pathways to receptors are evaluated in the following paragraphs.

Six documented private bedrock wells (Well Nos. 6, 58, 59, 93, 205, and 223) are within an approximate 1-mile radius of the center of the Base as shown on Figure 1 and in Table 10. Wells 58 and 59 are within ¼ mile of the northern boundary of the Base (north of and side gradient to AOC 1). Well 58 is reported as abandoned (The Johnson Company, 2018), and Well 59 is listed as an agricultural well in the Vermont Well Completion Searchable Database. Well 6 (listed as a domestic well in the database) is in a residential area southwest of the airport and approximately ½ mile southwest of (and upgradient from) the Base boundary. It is unknown if Well 6 is in use or how water from the well is used. The remaining wells (93, 205, and 223) are east of the Winooski River and are also listed as domestic wells in the database (VTDEC, 2019). Groundwater flow in the area of these wells is expected to be to the south toward the Winooski River.

Private bedrock Well 6 is located approximately 2,000 feet hydraulically upgradient from the Base AOCs, while private bedrock Wells 93, 205, and 223 are located across the Winooski River from the Base. The Winooski River is a regional hydraulic divide which separates groundwater resources on the south side of the river from those on the north side of the river, and as such Wells 93, 205, and 223 are unlikely to be affected by Base activities. There is no evidence to support the existence of an exposure pathway between the Base AOCs and Wells 6, 93, 205, and 223.

Well 59, located on a dairy farm property immediately north of the Base, is hydraulically downgradient from Base AOCs, as shown on Figure 5. In addition, PFAS data collected at newly sampled wells along the Base boundary and at newly installed monitoring wells BRLTNDG-MW02S, BRLTNDG-MW03S/D, and BRLTNDG-MW04S indicate that an exposure pathway between Base AOCs and Well 59 may be complete. However, the screen interval for Well 59 is significantly deeper (102 to 128 ft bgs) than PFAS detections observed at the closest newly installed monitoring well BRLTNDG-MW04S (5 to15 ft bgs) and BRLTNDG-MW04D (19 to 24 ft bgs). In addition, the combined sum of PFHpA, PFHxS, PFNA, PFOA, and PFOS at BRLTNDG-MW04D, which is the closest upgradient monitoring well to Well 59, was 18 J ng/L (Table 5 and Figure 8) which is significantly lower than the combined sum of PFHpA, PFHxS, PFNA, PFOA, and PFOS measured at Well 59 (257.03 J ng/L; Table 5 and Figure 8). Additional investigation is required in this area to confirm an exposure pathway between the Base AOCs and Well 59. In addition, although the ESI results indicate a possible connection between the Base AOCs and detections of PFAS at Well 59, ANG may not be the only contributor, and other potential contributors/activities in the vicinity will need to be investigated.

The Winooski River begins in the Town of Cabot and flows 90 miles to Lake Champlain. It enters Lake Champlain in the town of Colchester just north of Burlington. Winooski River uses include recreational boating and fishing (VTDEC, 2017). PFAS concentrations in river water measured during the ESI were

highest in close proximity to where surface water inputs from the Base mix with the Winooski River (combined sum of PFHpA, PFHxS, PFNA, PFOA, and PFOS of 549.4 J ng/L in sample BRLTNDG-002-SW, Figure 15). PFAS concentrations in the Winooski River in the upstream and downstream directions were lower, while PFAS concentrations in surface water samples collected from the seeps which eventually drain as surface water into the Winooski River were higher (maximum combined sum of PFHpA, PFHxS, PFNA, PFOA, and PFOS of 10,619 ng/L in sample BRLTNDG-006-SW, Figure 15). These data indicate an exposure pathway exists between ANG activities and the detections of PFAS in the Winooski River; however, there are no currently promulgated screening criteria or enforcement standards for PFAS in surface water established by the VTDEC or the USEPA. The portion of Winooski River impacted by a combined sum of PFHpA, PFHxS, PFNA, PFOA, and PFOS greater than the VTDEC Groundwater Enforcement Standard of 20 ng/L is limited in extent to the Base-side of the river near sample locations BRLTNDG-002-SW, BRLTNDG-014-SW, and BRLTNUP-005-SW (Figure 15). The combined sum of PFHpA, PFHxS, PFNA, PFOA, and PFOS in samples collected at locations on the opposite bank, upstream, and downstream in the Winooski River were below 20 ng/L (Figure 15), indicating that impacts to surface water are isolated to a defined stretch of the river adjacent to and near the Base on the Base-side of the river only. Although the ESI results indicate a connection between the Base AOCs and detections of PFAS in the Winooski River, ANG may not be the only contributor, and other potential contributors/activities in the vicinity will need to be investigated.

SECTION 4.0 Conclusions and Recommendations

The conclusions presented herein are based upon data derived from samples collected during the SI (Aerostar SES, 2018) and the ESI at on-Base and off-Base locations and an evaluation of the results compared to applicable PALs. An overview of PAL exceedances by AOC and media is presented on Table 11.

- The uppermost water-bearing zone at Burlington ANGB occurs under unconfined (water table) conditions in deltaic glaciofluvial sands and silts. This surficial water-bearing zone is underlain by a potentially confining to semi-confining lacustrine clay layer present across much of the Base. A second deeper water bearing zone occurs within glacial till and the underlying limestone and marble bedrock of the Ordovician Bascom Formation bedrock. The low permeability clay aquitard that separates the water bearing zones is discontinuous and is absent under the flight line in the vicinity of AOC 5 and to the northwest past AOC 6. This low permeability unit is present at significant thickness (10 to 30 feet) beneath AOCs 1, 2, 3, and 4 and likely serves as a barrier to vertical migration in the main Burlington ANGB area.
- Generally consistent with historical data, ESI groundwater elevation data confirms that shallow groundwater flow is generally towards the northeast; however, there is a north-northwestern flow component to the northwest of AOC 1. In addition, shallow groundwater at AASF (AOC 6) flows towards the east. The groundwater velocities calculated from slug test hydraulic conductivities ranged from 0.1 to 6.43 feet per day.
- Soil and sediment analytical samples indicate that PFBS, PFOA, and PFOS were not detected above the PAL in any sample collected at the Base during the SI and ESI.
- Groundwater, surface water, and stormwater analytical samples indicate that PFHpA, PFHxS, PFNA, PFOA, and/or PFOS were detected at concentrations greater than their respective PAL both on-Base and off-Base.
- Analytical results from groundwater wells on-Base indicate that the AOCs can be categorized as either a primary source area (PFAS groundwater contamination greater than two orders of magnitude above PALs) or a secondary source area (PFAS groundwater contamination less than two orders of magnitude above PALs). Primary source areas include AOC 1 (Former FTA 1 [IRP Site 1]), AOC 2 (Building 90 Former Fire Station), AOC 3 (Building 60 Current Fire Station), and AOC 4 (Fire Department Equipment Testing Area). Secondary source areas include AOC 5 (F-16 Emergency Response Site) and AOC 6 (Cessna Crash Response Site).
- Analytical results from surface water samples collected both on-Base and off-Base indicate that surface water gullies and seeps are impacted with PFAS concentrations above PALs. Two samples collected where on-Base surface water mix with the Winooski River also indicated PFAS concentrations in excess of PALs; however, additional samples collected in the Winooski River on the opposite bank, upstream, and downstream of the Base indicate that PFAS concentrations are below PALs. Sampling in the Winooski River indicates that PFAS concentrations greater than PALs are limited to the area immediately adjacent to the Base.
- Analytical results from stormwater samples collected on-Base indicate that water in the stormwater infrastructure during storm events is impacted with PFAS concentrations above PALs.

- Primary source AOCs with history of routine AFFF storage, handling, or use exhibit a characteristic PFAS signature dominated by PFOS at relatively elevated concentrations. The PFOS signature attributed to AFFF storage, handling, or use appears to be superimposed on an ambient PFAS signature characterized by dominant PFBA, which is attributable to a non-AFFF source. Most distal, downgradient, and off-site monitoring wells and some surface water samples reflect an AFFF "type signature" combined with a dominant PFBA signature, indicating multiple possible PFAS sources.
- The storm sewer line inspection determined that two of the storm sewer lines had offset joints, deformed pipes, or areas of standing water. One other storm sewer line, connected to an infiltration gallery, was continuously discharging water from the infiltration gallery to Outfall NG001-P, located off-Base on the north side of National Guard Ave. Analytical results from a non-storm event surface water sample collected at Outfall NG001-P indicated that the water discharging from that outfall was impacted with PFAS concentrations above PALs.
- During the receptor survey, five existing private water wells were identified within one mile of the Base. Four of the five identified wells are either located upgradient from the Base or are located across the Winooski River from the Base. There is no evidence to support the existence of an exposure pathway between the Base AOCs and those four wells. The remaining well (Well-59) is located hydraulically downgradient from Base AOCs and sampling conducted during the ESI indicates that an exposure pathway between the Base AOCs and this well may be complete, though additional investigation is required for confirmation. In addition, although the ESI results indicate a possible connection between the Base AOCs and detections of PFAS at Well 59, ANG may not be the only contributor, and other potential contributors/activities in the vicinity will need to be investigated
- PFAS sampling in surface water in the river and in surface water drainages on Base indicate an exposure pathway between Base AOCs and a portion of the Winooski River, limited to a defined stretch of the river adjacent to and near the Base on the Base-side of the river only. Although the ESI results indicate a connection between the Base AOCs and detections of PFAS in the Winooski River, ANG may not be the only contributor, and other potential contributors/activities in the vicinity will need to be investigated.

Based on the ESI results, the following are recommended:

- Further investigation should be completed as a Remedial Investigation.
- Additional investigation of PFAS concentrations should be conducted in groundwater upgradient and downgradient of the primary source areas (AOC 1, AOC 2, AOC 3, and AOC 4), and additional vertical characterization of PFAS concentrations in groundwater including bedrock should be performed.
- Evaluation of groundwater, surface water, and stormwater PFAS contributions to the Winooski River and surface drainage ditches on the north side of the Base should be conducted through further investigation of surface water and stormwater.
- An additional investigation should be conducted near Well 59 to confirm an exposure pathway exists between Base AOCs and Well 59 and near Well 59 and the Winooski River to determine if there are other potential contributors or activities in the vicinity which may also have a PFAS exposure pathway to the receptors.

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TABLES

Table 1
Expanded Site Inspection Sampling Summary
Expanded Site Inspection Report for PFAS
Burlington ANGB, South Burlington, Vermont

AOC	AOC Name	Media Impacted Above PALs per SI	Number of SBs	Number of Monitoring Wells		Number of Samples				
				Existing	New	SO	GW	SW	SD	ST
1	Former FTA 1 (IRP Site 1)	GW and SW	2	10	0	4	19	0	0	0
2	Building 90 Former Fire Station	GW and SW	0	7	2	0	18	0	0	0
3	Building 60 Current Fire Station	GW and SW	0	0	2	0	4	0	0	0
4	Fire Department Equipment Testing Area	GW	0	0	2	0	6	0	0	0
5	F-16 Emergency Response Site	GW	0	1	0	0	2	0	0	0
6	Cessna Crash Response Site	Unknown	0	0	3	0	6	0	0	0
Downgradient	--	Unknown	0	1*	9	0	20	22	13	9
Upgradient	--	Unknown	0	1	1	0	2	5	0	0

Notes:

GW - groundwater
IRP - Installation Restoration Program
PAL - Project Action Limit
SI - Site Inspection
SB - soil boring
SD - sediment
SO - soil
ST - storm water
SW - surface water

Table 2
Monitoring Well Construction Details
Expanded Site Inspection Report for PFAS
Burlington ANGB, South Burlington, Vermont

AOC	Well Identification	Well Type	Ground Surface Elevation (NAVD88 feet amsl)	Top of Casing Elevation (NAVD88 feet amsl)	Screened Interval (feet bgs)	Well Diameter (inches)	Casing	Surface Completion	Lithology of Well Screen Interval
2	BRLTN02-MW01D	Deep	325.13	324.90	55 - 60	2	PVC	Flushmount	Silt
2	BRLTN02-MW01S	Shallow	325.33	325.21	25 - 35	2	PVC	Flushmount	Sand and Silt
3	BRLTN03-MW01D	Deep	323.91	323.79	70 - 80	2	PVC	Flushmount	Clay
3	BRLTN03-MW01S	Shallow	323.90	323.67	12.5 - 22.5	2	PVC	Flushmount	Sand
4	BRLTN04-MW01D	Deep	324.25	323.93	64.5 - 74.5	2	PVC	Flushmount	Clay and Silt
4	BRLTN04-MW01S	Shallow	324.20	324.09	15 - 25	2	PVC	Flushmount	Sand
6	AASF06-MW01S	Shallow	298.39	298.07	5 - 15	2	PVC	Flushmount	Clay and Marble Bedrock
6	AASF06-MW02S	Shallow	285.28	285.21	6 - 16	2	PVC	Flushmount	Clay and Marble Bedrock
6	AASF06-MW03S	Shallow	267.41	267.06	6 - 16	2	PVC	Flushmount	Clay, Silt, Sand, and Marble Bedrock
Downgradient	BRLTNDG-MW01D	Deep	284.40	284.29	70 - 75	2	PVC	Flushmount	Sand
Downgradient	BRLTNDG-MW01S	Shallow	284.37	284.17	50 - 60	2	PVC	Flushmount	Sand
Downgradient	BRLTNDG-MW02S	Shallow	286.47	286.16	4.8 - 14.8	2	PVC	Flushmount	Sand
Downgradient	BRLTNDG-MW03D	Deep	296.56	296.38	23 - 33	2	PVC	Flushmount	Sand
Downgradient	BRLTNDG-MW03S	Shallow	296.60	296.38	7 - 12	2	PVC	Flushmount	Clay
Downgradient	BRLTNDG-MW04D	Deep	222.32	221.92	19 - 24	2	PVC	Flushmount	Silt and Gravel
Downgradient	BRLTNDG-MW04S	Shallow	222.46	222.08	5 - 15	2	PVC	Flushmount	Clay
Downgradient	BRLTNDG-MW05D	Deep	247.84	247.48	26 - 36	2	PVC	Flushmount	Clay
Downgradient	BRLTNDG-MW05S	Shallow	247.65	247.28	7.5 - 17.5	2	PVC	Flushmount	Sand and Gravel
Upgradient	BRLTNUP-MW01D	Deep	327.03	326.78	48 - 58	2	PVC	Flushmount	Sand and Silt

Notes:

amsl - above mean sea level

bgs - below ground surface

NAVD88 - North American Vertical Datum of 1988

PVC - polyvinyl chloride

Table 3
Groundwater Elevation Data
Expanded Site Inspection Report for PFAS
Burlington ANGB, South Burlington, Vermont

Well Identification	Well Type	Top of Casing Elevation (NAVD88 feet amsl)	Screened Interval (feet bgs)	Date	Time	Depth to Water	Groundwater Elevation (NAVD88 feet amsl)	Total Depth (feet btoc)	Notes
AASF06-MW01S	Shallow	298.07	5 - 15	7/15/2019	13:52	14.32	283.75	14.89	
AASF06-MW02S	Shallow	285.21	6 - 16	7/15/2019	12:23	12.06	273.15	14.84	
AASF06-MW03S	Shallow	267.06	6 - 16	7/13/2019	9:42	7.08	259.98	15.22	
BRLTN02-MW01D	Deep	324.90	55 - 60	7/13/2019	8:47	23.67	301.23	60.11	
BRLTN02-MW01S	Shallow	325.21	25 - 35	7/13/2019	8:42	21.57	303.64	35.05	
BRLTN03-MW01D	Deep	323.79	70 - 80	7/13/2019	8:37	61.88	261.91	80.64	Soft bottom
BRLTN03-MW01S	Shallow	323.67	12.5 - 22.5	7/13/2019	8:30	15.14	308.53	22.19	
BRLTN04-MW01D	Deep	323.93	64.5 - 74.5	7/13/2019	9:05	69.54	254.39	74.22	
BRLTN04-MW01S	Shallow	324.09	15 - 25	7/13/2019	9:01	12.06	312.03	24.82	
BRLTNDG-MW01D	Deep	284.29	70 - 75	7/13/2019	9:57	53.88	230.41	75.32	
BRLTNDG-MW01S	Shallow	284.17	50 - 60	7/13/2019	9:52	53.8	230.37	59.57	
BRLTNDG-MW02S	Shallow	286.16	4.8 - 14.8	7/13/2019	8:59	12.08	274.08	14.65	
BRLTNDG-MW03D	Deep	296.38	23 - 33	7/13/2019	9:33	12.06	284.32	33.17	
BRLTNDG-MW03S	Shallow	296.38	7 - 12	7/13/2019	9:40	4.22	292.16	12.01	
BRLTNDG-MW04D	Deep	221.92	19 - 24	7/13/2019	9:12	9.84	212.08	24.15	
BRLTNDG-MW04S	Shallow	222.08	5 - 15	7/13/2019	9:19	4.1	217.98	14.84	
BRLTNDG-MW05D	Deep	247.48	26 - 36	7/13/2019	9:57	22.1	225.38	35.63	
BRLTNDG-MW05S	Shallow	247.28	7.5 - 17.5	7/13/2019	10:08	15.16	232.12	16.67	
BRLTNUP-MW01D	Deep	326.78	48 - 58	7/13/2019	10:10	10.72	316.06	56.8	
BTV-MW-14	Shallow	318.83	unknown	7/13/2019	9:26	13.22	305.61	22.96	
BTV-MW-5	Shallow	327.28	unknown	7/13/2019	10:18	10.51	316.77	14.4	
BTV-MW-9	Shallow	296.10	unknown	7/13/2019	9:41	20.87	275.23	32.85	
MW-101	Shallow	268.87	1 - 11	7/13/2019	9:30	3.90	264.97	13.02	
MW-105	Deep	260.65	81.5 - 91.5	7/13/2019	9:10	11.8	248.85	96.64	Soft bottom; silt on probe
MW-401	Shallow	282.44	unknown	7/13/2019	8:29	25.47	256.97	36.54	
MW-403	Shallow	280.46	unknown	7/13/2019	8:24	20.86	259.60	31.55	
MW-405	Shallow	282.49	unknown	7/13/2019	8:18	15.13	267.36	22.17	

Table 3
Groundwater Elevation Data
Expanded Site Inspection Report for PFAS
Burlington ANGB, South Burlington, Vermont

Well Identification	Well Type	Top of Casing Elevation (NAVD88 feet amsl)	Screened Interval (feet bgs)	Date	Time	Depth to Water	Groundwater Elevation (NAVD88 feet amsl)	Total Depth (feet btoc)	Notes
V1-BR-08	Deep	310.72	unknown	7/13/2019	8:44	28.97	281.75	49.43	
V1-MW1	Shallow	311.71	11 - 16	7/13/2019	8:32	9.1	302.61	17.51	
V1-MW-106	Shallow	257.37	unknown	7/13/2019	9:04	8.30	249.07	18.07	
V1-MW-107	Shallow	272.38	unknown	7/13/2019	9:23	13.88	258.50	19.46	
V1-MW12	Shallow	312.08	12.86 - 22.87	7/13/2019	8:48	15.16	296.92	25.07	
V1-MW14	Shallow	277.68	3.55 - 13.55	7/13/2019	9:21	10.07	267.61	11.88	
V1-RFW2	Shallow	307.84	11 - 21	7/13/2019	8:53	9.64	298.20	24.46	
V4-BR03	Deep	256.73	unknown	7/13/2019	8:51	64.08	192.65	115.5	Soft bottom
V4-MW413	Shallow	257.64	unknown	7/13/2019	8:46	17.02	240.62	41.54	
V4-MW414	Deep	257.74	unknown	7/13/2019	8:42	43.95	213.79	69.38	
V4-MW-5	Shallow	276.55	34 - 44	7/13/2019	8:28	28.94	247.61	46.27	

Notes:

Top of casing elevations for existing VTANG wells not installed by Parsons were taken from Table 4-1 Synoptic WL Measurements and Elevations, Final RI Report - Sites 1 ,2, 3, 4, 5A, and 5B, 158th Fighter Wing, VANG, Burlington Air National Guard Base, South Burlington, Vemont, CH2M Hill March 2010

Top of casing elevations for existing BTV wells provided by Stantec.

MW-401 and MW-405 were resurveyed by Parsons following main gate construction project which altered their elevations.

amsl - above mean sea level

bgs - below ground surface

btoc - below top of casing

NAVD88 - North American Vertical Datum of 1988

Table 4
Summary of Soil Analytical Results
Expanded Site Inspection Report for PFAS
Burlington ANGB, South Burlington, Vermont

AOC	LOCID	Sample ID	Sample Date	Sample Type[1]	4:2FTS (ng/g)	6:2FTS (ng/g)	8:2FTS (ng/g)	NEtFOSAA (ng/g)	NMeFOSAA (ng/g)	PFBA (ng/g)	PFDA (ng/g)	PFDoA (ng/g)	PFDS (ng/g)
				PAL	NA	NA	NA	NA	NA	NA	NA	NA	NA
1	BRLTN01-003-SO	BRLTN-003-SO-5.0-5.5	05/30/2019	N	<0.79 U	<2.0 U	<2.0 U	<2.1 UJ	<2.1 UJ	<1.3 U	<0.71 U	<0.71 U	<2.1 U
1	BRLTN01-003-SO	BRLTN-093-SO-5.0-5.5	05/30/2019	FD	<0.73 U	<1.8 U	<1.8 U	<1.9 UJ	<1.9 UJ	<1.2 U	<0.66 U	<0.66 U	<1.9 U
1	BRLTN01-003-SO	BRLTN-003-SO-7.0-7.5	05/30/2019	N	<0.73 U	<1.9 U	<1.9 U	<2.0 UJ	<2.0 UJ	<1.2 U	<0.66 U	<0.66 U	<2.0 U
1	BRLTN01-004-SO	BRLTN-004-SO-5.0-5.5	05/30/2019	N	<0.79 U	<2.0 U	<2.0 U	<2.1 U	<2.1 U	<1.3 U	<0.72 U	<0.72 U	<2.1 U
1	BRLTN01-004-SO	BRLTN-004-SO-6.0-6.5	05/30/2019	N	<0.83 U	<2.1 U	<2.1 U	<2.2 U	<2.2 U	<1.3 U	<0.75 U	<0.75 U	<2.2 U

AOC	LOCID	Sample ID	Sample Date	Sample Type[1]	PFHpA (ng/g)	PFHpS (ng/g)	PFHxA (ng/g)	PFHxS (ng/g)	PFNA (ng/g)	PFNS (ng/g)	PFOSA (ng/g)	PFPeA (ng/g)	PFPeS (ng/g)
				PAL	NA	NA	NA	NA	NA	NA	NA	NA	NA
1	BRLTN01-003-SO	BRLTN-003-SO-5.0-5.5	05/30/2019	N	**0.42 J**	**1.7**	**0.63 J**	**13**	**0.23 J**	<0.68 U	**30**	**0.24 J**	<0.67 U
1	BRLTN01-003-SO	BRLTN-093-SO-5.0-5.5	05/30/2019	FD	**0.45 J**	**1.8**	**0.49 J**	**13**	**0.30 J**	<0.63 U	**38**	<0.66 U	<0.62 U
1	BRLTN01-003-SO	BRLTN-003-SO-7.0-7.5	05/30/2019	N	**0.52 J**	**1.1**	**0.54 J**	**20**	<0.66 U	<0.63 U	<0.66 U	<0.66 U	<0.62 U
1	BRLTN01-004-SO	BRLTN-004-SO-5.0-5.5	05/30/2019	N	<0.72 U	**0.30 J**	**1.0**	**2.5**	<0.72 U	<0.68 U	**3.7**	<0.72 U	<0.67 U
1	BRLTN01-004-SO	BRLTN-004-SO-6.0-6.5	05/30/2019	N	<0.75 U	<0.72 U	<0.75 U	**0.59 J**	<0.75 U	<0.72 U	**0.46 J**	<0.75 U	<0.70 U

AOC	LOCID	Sample ID	Sample Date	Sample Type[1]	PFTeA (ng/g)	PFTriA (ng/g)	PFUnA (ng/g)	PFBS (ng/g)	PFOA (ng/g)	PFOS (ng/g)
				PAL	NA	NA	NA	1,260,000[2]	300[3]	1,260[2]
1	BRLTN01-003-SO	BRLTN-003-SO-5.0-5.5	05/30/2019	N	<0.71 U	<0.71 U	<0.71 U	<0.63 U	**9.7**	**110 J**
1	BRLTN01-003-SO	BRLTN-093-SO-5.0-5.5	05/30/2019	FD	<0.66 U	<0.66 U	<0.66 U	<0.58 U	**11**	**160 J**
1	BRLTN01-003-SO	BRLTN-003-SO-7.0-7.5	05/30/2019	N	<0.66 U	<0.66 U	<0.66 U	<0.59 U	**11**	**13 J**
1	BRLTN01-004-SO	BRLTN-004-SO-5.0-5.5	05/30/2019	N	<0.72 U	<0.72 U	<0.72 U	<0.63 U	**1.1**	**230**
1	BRLTN01-004-SO	BRLTN-004-SO-6.0-6.5	05/30/2019	N	<0.75 U	<0.75 U	<0.75 U	<0.66 U	<0.75 U	**17 J**

Table 4
Summary of Soil Analytical Results
Expanded Site Inspection Report for PFAS
Burlington ANGB, South Burlington, Vermont

AOC	LOCID	Sample ID	Sample Date	Sample Type[1]	Calcium (mg/kg)	Iron (mg/kg)	Manganese (mg/kg)	Potassium (mg/kg)	Chloride (mg/kg)	Sulfate (mg/kg)	Organic Carbon	pH (pH units)
				PAL	NA	NA	NA	NA	NA	NA	NA	NA
1	BRLTN01-003-SO	BRLTN-003-SO-5.0-5.5	05/30/2019	N	**999**	**13,900**	**301**	**448**	**10.4 J**	**11.6 J**	**2,510**	**7.38 J**
1	BRLTN01-003-SO	BRLTN-093-SO-5.0-5.5	05/30/2019	FD	--	--	--	--	--	--	--	--
1	BRLTN01-003-SO	BRLTN-003-SO-7.0-7.5	05/30/2019	N	**756 J**	**11,500 J**	**374 J**	**430**	**6.05 J**	**9.80 J**	**472 J**	**6.56 J**
1	BRLTN01-004-SO	BRLTN-004-SO-5.0-5.5	05/30/2019	N	**906**	**12,400**	**399**	**515**	<10.2 U	**7.50 J**	**592**	**7.81 J**
1	BRLTN01-004-SO	BRLTN-004-SO-6.0-6.5	05/30/2019	N	--	--	--	--	--	--	--	**7.14 J**

Notes:

[1] N - Normal field sample. FD - Field duplicate of sample above.

[2] USEPA RSL Calc - USEPA Regional Screening Level Calculator, Residential Soil, HQ=1.0; available at: https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search.

[3] VDH SL - Vermont Department of Health Screening Level.

Detections are bolded.

-- - Analyte not tested for this sample.

J - Analyte detected, estimated concentration.

NA - No screening level available.

ng/g - nanograms per gram.

mg/kg - milligrams per kilogram.

U - Analyte not detected. Result reported as < LOD (Limit of Detection).

UJ - Analyte not detected. LOD is approximate.

Table 5
Summary of Groundwater Analytical Results
Expanded Site Inspection Report for PFAS
Burlington ANGB, South Burlinton, Vermont

AOC	LOCID	Sample ID	Sample Date	Sample Type[1]	4:2FTS (ng/L)	6:2FTS (ng/L)	8:2FTS (ng/L)	NEtFOSAA (ng/L)	NMeFOSAA (ng/L)	PFBA (ng/L)	PFDA (ng/L)	PFDoA (ng/L)	PFDS (ng/L)
				PAL	NA	NA	NA	NA	NA	NA	NA	NA	NA
1	BTV-MW-14	BTV-MW-14-01	06/12/2019	N	<1.8 U	<1.8 U	<1.8 U	<2.2 U	<2.2 U	**41**	<1.1 U	<1.1 U	<2.1 U
1	BTV-MW-14	BTV-MW-14-02	07/11/2019	N	<0.89 U	<3.6 U	<1.8 U	<0.89 U	<1.1 U	**35**	<0.89 U	<0.89 U	<0.89 U
1	BTV-MW-14	BTV-MW-14-92	07/11/2019	FD	<0.89 U	<3.6 U	<1.8 U	<0.89 U	<1.1 U	**34**	<0.89 U	<0.89 U	<0.89 U
1	MW-101	MW-101-01	06/11/2019	N	<19 U	**380**	<19 U	<23 U	<23 U	**220**	<11 U	<11 U	<22 U
1	MW-101	MW-101-02	07/12/2019	N	**3.9 J**	**360**	<1.8 U	<0.89 U	<1.1 U	**240**	<0.89 U	<0.89 U	<0.89 U
1	MW-105	MW-105-01	06/10/2019	N	<18 U	**270**	<18 U	<21 U	<21 U	**180**	<11 U	<11 U	<20 U
1	MW-105	MW-105-02	06/30/2019	N	**4.5**	**130**	<1.9 U	<2.2 U	<2.2 U	**160**	<1.1 U	<1.1 U	<2.1 U
1	V1-BR-08	V1-BR-08-01	06/10/2019	N	<19 U	**310**	<19 U	<23 U	<23 U	**290**	<11 U	<11 U	<22 U
1	V1-MW1	V1-MW1-01	06/10/2019	N	<17 U	**260**	<17 U	<21 U	<21 U	**140**	<10 U	<10 U	<20 U
1	V1-MW1	V1-MW1-02	07/10/2019	N	**3.8**	**540**	**13**	<0.92 U	<1.1 U	**130**	**1.4 J**	<0.92 U	**1.1 J**
1	V1-MW-106	V1-MW-106-01	06/10/2019	N	<19 U	**420**	<19 U	<22 U	<22 U	**340**	<11 U	<11 U	<22 U
1	V1-MW-106	V1-MW-106-02	07/12/2019	N	**3.6**	**290**	**3.6**	<0.83 U	<0.99 U	**250**	**1.8**	<0.83 U	<0.83 U
1	V1-MW-107	V1-MW-107-01	06/03/2019	N	<1.8 R	<1.8 U	<1.8 U	<2.2 U	<2.2 U	**11**	<1.1 U	<1.1 U	<2.1 U
1	V1-MW-107	V1-MW-107-02	06/30/2019	N	<1.8 U	<1.8 U	<1.8 U	<2.1 U	<2.1 U	**30**	<1.1 U	<1.1 U	<2.1 U
1	V1-MW12	V1-MW12-01	06/10/2019	N	<19 UJ	**330**	<19 U	<22 U	<22 U	**1,200**	<11 U	<11 U	<21 U
1	V1-MW12	V1-MW12-02	07/10/2019	N	<9.0 U	**310**	<18 U	<9.0 U	<11 U	**780**	<9.0 U	<9.0 U	<9.0 U
1	V1-MW14	V1-MW14-01	06/03/2019	N	<1.9 R	**10 J**	<1.9 U	<2.3 U	<2.3 U	**71**	<1.1 U	<1.1 U	<2.2 U
1	V1-MW14	V1-MW14-02	06/30/2019	N	<18 U	**10 J**	<18 U	<22 U	<22 U	**71**	<11 U	<11 U	<21 U
1	V1-RFW2	V1-RFW2-01	06/10/2019	N	**7.9 J**	**500**	<16 U	<19 U	<19 U	**310**	<9.5 U	<9.5 U	<18 U
1	V1-RFW2	V1-RFW2-91	06/10/2019	FD	**10 J**	**550**	<16 U	<19 U	<19 U	**350**	<9.4 U	<9.4 U	<18 U
1	V1-RFW2	V1-RFW2-02	07/10/2019	N	**7.3**	**300**	**1.7 J**	<0.89 U	<1.1 U	**210**	**1.8 J**	<0.89 U	<0.89 U
2	BRLTN02-MW01D	BRLTN02-MW01D-01	06/19/2019	N	<1.8 U	**5.9**	<1.8 U	<2.2 U	<2.2 U	**15**	<1.1 U	<1.1 U	<2.1 U
2	BRLTN02-MW01D	BRLTN02-MW01D-91	06/19/2019	FD	<1.8 U	**6.3**	<1.8 U	<2.1 U	<2.1 U	**16**	<1.1 U	<1.1 U	<2.1 U
2	BRLTN02-MW01D	BRLTN02-MW01D-02	07/10/2019	N	<0.95 U	**12**	<1.9 U	<0.95 U	<1.1 U	**17**	<0.95 U	<0.95 U	<0.95 U
2	BRLTN02-MW01S	BRLTN02-MW01S-01	06/19/2019	N	**21 J**	**3,500**	**410**	<22 U	<22 U	**240**	**4.9 J**	<11 U	<21 U
2	BRLTN02-MW01S	BRLTN02-MW01S-02	07/10/2019	N	**13 J**	**3,300**	**250**	<9.4 U	<11 U	**170**	<9.4 U	<9.4 U	<9.4 U
2	BRLTN02-MW01S	BRLTN02-MW01S-92	07/10/2019	FD	**13 J**	**3,200**	**230**	<9.1 U	<11 U	**180**	<9.1 U	<9.1 U	<9.1 U
2	MW-401	MW-401-01	06/02/2019	N	**2.2 R**	**1,700 J**	**4.6**	<2.1 U	<2.1 U	**110**	<1.1 U	<1.1 U	<2.1 U
2	MW-401	MW-401-02	06/30/2019	N	<18 U	**1,500**	<18 U	<22 U	<22 U	**87**	<11 U	<11 U	<21 U
2	MW-403	MW-403-01	06/04/2019	N	<1.8 R	**130**	**360**	<2.2 U	<2.2 U	**84**	**3.8**	<1.1 U	<2.1 U
2	MW-403	MW-403-91	06/04/2019	FD	<1.8 R	**130**	**370**	<2.2 U	<2.2 U	**82**	**4.4**	<1.1 U	<2.1 U
2	MW-403	MW-403-02	06/30/2019	N	<1.9 U	**150**	**330**	<2.2 U	<2.2 U	**88**	**3.9**	<1.1 U	<2.1 U
2	MW-405	MW-405-01	06/02/2019	N	<1.8 R	**8.2 R**	<1.8 U	<2.2 U	<2.2 U	**45**	<1.1 U	<1.1 U	<2.1 U

Table 5
Summary of Groundwater Analytical Results
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AOC	LOCID	Sample ID	Sample Date	Sample Type[1]	PFHpS (ng/L)	PFHxA (ng/L)	PFNS (ng/L)	PFOSA (ng/L)	PFPeA (ng/L)	PFPeS (ng/L)	PFTeA (ng/L)	PFTriA (ng/L)	PFUnA (ng/L)
				PAL	NA	NA	NA	NA	NA	NA	NA	NA	NA
1	BTV-MW-14	BTV-MW-14-01	06/12/2019	N	<1.0 U	2.0	<2.1 U	<2.6 U	2.4 J	<1.0 U	<1.1 U	<1.1 U	<1.1 U
1	BTV-MW-14	BTV-MW-14-02	07/11/2019	N	<0.89 U	2.3	<0.89 U	<0.89 U	3.0	<0.89 U	<0.89 U	<0.89 U	<0.89 U
1	BTV-MW-14	BTV-MW-14-92	07/11/2019	FD	<0.89 U	2.2	<0.89 U	<0.89 U	3.0	<0.89 U	<0.89 U	<0.89 U	<0.89 U
1	MW-101	MW-101-01	06/11/2019	N	120	1,000	<22 U	<27 U	490	900	<11 U	<11 U	<11 U
1	MW-101	MW-101-02	07/12/2019	N	190	1,000	<0.89 U	<0.89 UJ	590	810	<0.89 U	<0.89 U	<0.89 U
1	MW-105	MW-105-01	06/10/2019	N	100	1,500	<20 U	<26 U	480	560	<11 U	<11 U	<11 U
1	MW-105	MW-105-02	06/30/2019	N	150	950	<2.1 U	<2.7 U	360	380	<1.1 U	<1.1 U	<1.1 U
1	V1-BR-08	V1-BR-08-01	06/10/2019	N	430	2,900	<22 U	41	700	840	<11 U	<11 U	<11 U
1	V1-MW1	V1-MW1-01	06/10/2019	N	66	370	<20 U	190	120	270	<10 U	<10 U	<10 U
1	V1-MW1	V1-MW1-02	07/10/2019	N	130	700	5.1	100 J	240	330	<0.92 U	<0.92 U	<0.92 U
1	V1-MW-106	V1-MW-106-01	06/10/2019	N	460	1,800	<22 U	10 J	690	960	<11 U	<11 U	<11 U
1	V1-MW-106	V1-MW-106-02	07/12/2019	N	380	1,600	4.3 J	18	610	1,000	<0.83 U	<0.83 U	<0.83 U
1	V1-MW-107	V1-MW-107-01	06/03/2019	N	0.46 J	4.5	<2.1 U	<2.7 U	<4.4 U	9.6	<1.1 U	<1.1 U	<1.1 U
1	V1-MW-107	V1-MW-107-02	06/30/2019	N	0.77 J	7.3	<2.1 U	<2.6 U	3.4 J	14	<1.1 U	<1.1 U	<1.1 U
1	V1-MW12	V1-MW12-01	06/10/2019	N	460	23,000	<21 U	<27 U	3,900	1,200	<11 U	<11 U	<11 U
1	V1-MW12	V1-MW12-02	07/10/2019	N	1,200	14,000	<9.0 U	7.5 J	2,500	1,600	<9.0 U	<9.0 U	<9.0 U
1	V1-MW14	V1-MW14-01	06/03/2019	N	90	590	<2.2 U	<2.7 U	110	110 J	<1.1 U	<1.1 U	<1.1 U
1	V1-MW14	V1-MW14-02	06/30/2019	N	59	530	<21 U	<27 U	130	110	<11 U	<11 U	<11 U
1	V1-RFW2	V1-RFW2-01	06/10/2019	N	460	2,900	<18 U	160 J	770	1,200	<9.5 U	<9.5 U	<9.5 U
1	V1-RFW2	V1-RFW2-91	06/10/2019	FD	510	3,100	<18 U	240 J	810	1,300	<9.4 U	<9.4 U	<9.4 U
1	V1-RFW2	V1-RFW2-02	07/10/2019	N	280	2,100	1.3 J	130 J	580	720	<0.89 U	<0.89 U	<0.89 U
2	BRLTN02-MW01D	BRLTN02-MW01D-01	06/19/2019	N	5.2	59	<2.1 U	<2.6 U	35	41	<1.1 U	<1.1 U	<1.1 U
2	BRLTN02-MW01D	BRLTN02-MW01D-91	06/19/2019	FD	5.2	61	<2.1 U	<2.6 U	37	44	<1.1 U	<1.1 U	<1.1 U
2	BRLTN02-MW01D	BRLTN02-MW01D-02	07/10/2019	N	7.9	70	<0.95 U	<0.95 UJ	47	52	<0.95 U	<0.95 U	<0.95 U
2	BRLTN02-MW01S	BRLTN02-MW01S-01	06/19/2019	N	270	1,300	5.9 J	250	590	310	<11 U	<11 U	<11 U
2	BRLTN02-MW01S	BRLTN02-MW01S-02	07/10/2019	N	210	1,100	<9.4 U	100 J	470	200	<9.4 U	<9.4 U	<9.4 U
2	BRLTN02-MW01S	BRLTN02-MW01S-92	07/10/2019	FD	220	1,100	<9.1 U	91 J	470	230	<9.1 U	<9.1 U	<9.1 U
2	MW-401	MW-401-01	06/02/2019	N	130	500	<2.1 U	1.5 J	240	60	<1.1 U	<1.1 U	<1.1 U
2	MW-401	MW-401-02	06/30/2019	N	77	310	<21 U	<26 U	160	34	<11 U	<11 U	<11 U
2	MW-403	MW-403-01	06/04/2019	N	7.2	190	2.7	1.3 J	130	27	<1.1 U	<1.1 U	<1.1 U
2	MW-403	MW-403-91	06/04/2019	FD	7.3	190	2.3 J	1.3 J	130	25	<1.1 U	<1.1 U	<1.1 U
2	MW-403	MW-403-02	06/30/2019	N	9.0	210	4.9	2.1 J	130	44	<1.1 U	<1.1 U	<1.1 U
2	MW-405	MW-405-01	06/02/2019	N	3.9	140	<2.1 U	<2.7 UJ	75	51	<1.1 U	<1.1 U	<1.1 U

Table 5
Summary of Groundwater Analytical Results
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AOC	LOCID	Sample ID	Sample Date	Sample Type[1]	PFBS (ng/L)	PFHpA (ng/L)	PFHxS (ng/L)	PFNA (ng/L)	PFOA (ng/L)	PFOS (ng/L)	SUM of PFHpA + PFHxS + PFNA + PFOA + PFOS (ng/L)
				PAL	400,000[2]	20[3]	20[3]	20[3]	20[3]	20[3]	20[3]
1	BTV-MW-14	BTV-MW-14-01	06/12/2019	N	1.0 J	<1.1 U	9.6	<1.1 U	<1.1 U	<1.1 U	9.6
1	BTV-MW-14	BTV-MW-14-02	07/11/2019	N	1.3 J	0.79 J	10	<0.89 U	<0.89 U	<0.89 U	10.79 J
1	BTV-MW-14	BTV-MW-14-92	07/11/2019	FD	1.3 J	0.53 J	10	<0.89 U	<0.89 U	<0.89 U	10.53 J
1	MW-101	MW-101-01	06/11/2019	N	620	290	3,600	12 J	360	1,600	5,862 J
1	MW-101	MW-101-02	07/12/2019	N	620	290	4,600	14	460	2,600	7,964
1	MW-105	MW-105-01	06/10/2019	N	470	240	3,400	4.7 J	1,500	1,000	6,144.7 J
1	MW-105	MW-105-02	06/30/2019	N	330	150	2,900	4.1	910	750	4,714.1
1	V1-BR-08	V1-BR-08-01	06/10/2019	N	640	400	7,800	21	2,100	9,200	19,521
1	V1-MW1	V1-MW1-01	06/10/2019	N	200	64	1,500	5.0 J	220	5,700	7,489 J
1	V1-MW1	V1-MW1-02	07/10/2019	N	310	99	2,400	12	370	13,000	15,881
1	V1-MW-106	V1-MW-106-01	06/10/2019	N	720	340	6,400	40	1,200	15,000	22,980
1	V1-MW-106	V1-MW-106-02	07/12/2019	N	800	230	5,800	25	940	14,000	20,995
1	V1-MW-107	V1-MW-107-01	06/03/2019	N	24	0.93 J	69	<1.1 U	5.8	10	85.73 J
1	V1-MW-107	V1-MW-107-02	06/30/2019	N	32	1.5 J	100	<1.1 U	9.7	16	127.2 J
1	V1-MW12	V1-MW12-01	06/10/2019	N	1,300	1,300	18,000	13 J	4,500	6,500	30,313 J
1	V1-MW12	V1-MW12-02	07/10/2019	N	1,200	1,000	29,000	13 J	7,400	12,000	49,413 J
1	V1-MW14	V1-MW14-01	06/03/2019	N	77 J	66	1,500	4.3	400	1,600	3,570.3
1	V1-MW14	V1-MW14-02	06/30/2019	N	90	63	1,400	<11 U	340	1,600	3,403
1	V1-RFW2	V1-RFW2-01	06/10/2019	N	890	480	8,200	17	1,700	15,000	25,397
1	V1-RFW2	V1-RFW2-91	06/10/2019	FD	960	530	8,700	18	1,800	17,000	28,048
1	V1-RFW2	V1-RFW2-02	07/10/2019	N	590	340	5,600	13	1,300	9,200	16,453
2	BRLTN02-MW01D	BRLTN02-MW01D-01	06/19/2019	N	34	10	310	<1.1 U	36	40	396
2	BRLTN02-MW01D	BRLTN02-MW01D-91	06/19/2019	FD	34	11	350	<1.1 U	37	43	441
2	BRLTN02-MW01D	BRLTN02-MW01D-02	07/10/2019	N	39	13	370	<0.95 U	42	23	448
2	BRLTN02-MW01S	BRLTN02-MW01S-01	06/19/2019	N	240	430	3,500	350	910	34,000	39,190
2	BRLTN02-MW01S	BRLTN02-MW01S-02	07/10/2019	N	150	350	2,900	290	890	26,000	30,430
2	BRLTN02-MW01S	BRLTN02-MW01S-92	07/10/2019	FD	150	340	2,700	320	990	29,000	33,350
2	MW-401	MW-401-01	06/02/2019	N	36	130	1,600	21	1,300	840	3,891
2	MW-401	MW-401-02	06/30/2019	N	25	82	1,000	16 J	840	830	2,768 J
2	MW-403	MW-403-01	06/04/2019	N	22	82	220	9.1	74	2,500	2,885.1
2	MW-403	MW-403-91	06/04/2019	FD	21	78	210	8.5	69	2,600	2,965.5
2	MW-403	MW-403-02	06/30/2019	N	31	120	260	12	110	2,700	3,202
2	MW-405	MW-405-01	06/02/2019	N	37	49	570	<1.1 U	56	540	1,215

Table 5
Summary of Groundwater Analytical Results
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AOC	LOCID	Sample ID	Sample Date	Sample Type[1]	4:2FTS (ng/L)	6:2FTS (ng/L)	8:2FTS (ng/L)	NEtFOSAA (ng/L)	NMeFOSAA (ng/L)	PFBA (ng/L)	PFDA (ng/L)	PFDoA (ng/L)	PFDS (ng/L)
				PAL	NA	NA	NA	NA	NA	NA	NA	NA	NA
2	MW-405	MW-405-02	06/29/2019	N	<1.8 U	**6.9**	<1.8 U	<2.2 U	<2.2 U	**42**	<1.1 U	<1.1 U	<2.1 U
2	V4-BR03	V4-BR03-01	06/14/2019	N	<1.7 U	<1.7 U	<1.7 U	<2.0 U	<2.0 U	<4.1 U	<1.0 U	<1.0 U	<2.0 U
2	V4-BR03	V4-BR03-02	07/11/2019	N	<0.92 U	<3.7 U	<1.8 U	<0.92 U	<1.1 U	<3.7 U	<0.92 U	<0.92 U	<0.92 U
2	V4-MW413	V4-MW413-01	06/03/2019	N	<1.9 UJ	**4.3**	**8.0**	<2.2 U	<2.2 U	**20**	<1.1 U	<1.1 U	<2.2 U
2	V4-MW413	V4-MW413-02	06/30/2019	N	<1.8 U	**2.2 J**	**9.2**	<2.1 U	<2.1 U	**23**	<1.1 U	<1.1 U	<2.0 U
2	V4-MW414	V4-MW414-01	06/14/2019	N	<1.8 U	<1.8 U	<1.8 U	<2.2 U	<2.2 U	<4.4 U	<1.1 U	<1.1 U	<2.1 U
2	V4-MW414	V4-MW414-02	07/11/2019	N	<0.92 U	<3.7 U	<1.8 U	<0.92 U	<1.1 U	<3.7 U	<0.92 U	<0.92 U	<0.92 U
2	V4-MW-5	V4-MW-5-01	06/11/2019	N	<1.8 U	**35**	**66**	<2.2 U	<2.2 U	**22**	**0.98 J**	<1.1 U	**1.3 J**
2	V4-MW-5	V4-MW-5-02	06/30/2019	N	<2.0 U	**32**	**52**	<2.4 U	<2.4 U	**21**	**1.1 J**	<1.2 U	**1.1 J**
3	BRLTN03-MW01D	BRLTN03-MW01D-01	06/17/2019	N	<1.8 U	**1.4 J**	<1.8 U	<2.2 U	<2.2 U	<4.4 U	<1.1 U	<1.1 U	<2.1 U
3	BRLTN03-MW01D	BRLTN03-MW01D-02	07/12/2019	N	<0.91 R	**17**	<1.8 U	<0.91 U	<1.1 U	**4.4 J**	**5.4**	**0.87 J**	<0.91 U
3	BRLTN03-MW01S	BRLTN03-MW01S-01	06/15/2019	N	**39**	**1,000**	**11 J**	<22 U	<22 U	**1,100 J**	<11 U	<11 U	<21 U
3	BRLTN03-MW01S	BRLTN03-MW01S-02	07/10/2019	N	**29**	**910**	**18 J**	<8.8 U	<11 U	**1,000**	<8.8 U	<8.8 U	<8.8 U
4	BRLTN04-MW01D	BRLTN04-MW01D-01	07/11/2019	N	<2.5 U	**18**	<5.0 U	<2.5 U	<3.0 U	**13**	<2.5 U	<2.5 U	<2.5 U
4	BRLTN04-MW01D	BRLTN04-MW01D-02	07/14/2019	N	<1.0 U	<15 U	<2.0 U	<1.0 U	<1.2 U	<4.1 U	<1.0 U	<1.0 U	<1.0 U
4	BRLTN04-MW01S	BRLTN04-MW01S-01	06/29/2019	N	<1.8 U	**63**	**1.9 J**	<2.2 U	<2.2 U	**55 R**	<1.1 U	<1.1 U	<2.1 U
4	BRLTN04-MW01S	BRLTN04-MW01S-91	06/29/2019	FD	<1.8 U	**57**	**1.2 J**	<2.1 U	<2.1 U	**47 R**	<1.1 U	<1.1 U	<2.0 U
4	BRLTN04-MW01S	BRLTN04-MW01S-02	07/12/2019	N	**0.51 R**	**250**	**7.6**	<0.89 U	<1.1 U	<35 R	<0.89 U	<0.89 U	<0.89 U
4	BRLTN04-MW01S	BRLTN04-MW01S-92	07/12/2019	FD	<0.88 R	**320**	**9.5**	<0.88 U	<1.1 U	<35 UJ	<0.88 U	<0.88 U	<0.88 U
5	BTV-MW-9	BTV-MW-9-01	06/12/2019	N	<1.9 U	<1.9 U	<1.9 U	<2.2 U	<2.2 U	**86**	<1.1 U	<1.1 U	<2.1 U
5	BTV-MW-9	BTV-MW-9-02	07/11/2019	N	<0.90 U	<3.6 U	<1.8 U	<0.90 U	<1.1 U	**68**	<0.90 U	<0.90 U	<0.90 U
6	AASF06-MW01S	AASF06-MW01S-01	07/01/2019	N	<1.8 U	**0.96 J**	<1.8 U	<2.2 U	<2.2 U	<4.4 U	<1.1 U	<1.1 U	<2.1 U
6	AASF06-MW01S	AASF06-MW01S-02	07/16/2019	N	<1.2 U	<5.0 U	<2.5 U	<1.2 U	<1.5 U	**9.3 J**	<1.2 UJ	<1.2 U	<1.2 UJ
6	AASF06-MW02S	AASF06-MW02S-01	06/25/2019	N	<1.8 U	<1.8 U	<1.8 U	<2.1 U	<2.1 U	**24**	<1.1 UJ	<1.1 U	<2.0 U
6	AASF06-MW02S	AASF06-MW02S-02	07/16/2019	N	<0.89 R	<3.6 U	<1.8 U	<0.89 UJ	<1.1 U	**22 J**	<0.89 UJ	<0.89 U	<0.89 UJ
6	AASF06-MW03S	AASF06-MW03S-01	06/16/2019	N	<1.8 UJ	**380**	**2.0 J**	<2.1 U	<2.1 U	**82 J**	<1.1 U	<1.1 U	<2.0 U
6	AASF06-MW03S	AASF06-MW03S-02	07/12/2019	N	**0.97 R**	**1,200**	**14**	<0.91 U	<1.1 U	**190**	**0.59 J**	<0.91 U	<0.91 U
DG	BRLTNDG-MW01D	BRLTNDG-MW01D-01	06/18/2019	N	<1.8 UJ	**16**	<1.8 U	<2.1 U	<2.1 U	**8.4**	<1.1 U	<1.1 U	<2.1 U
DG	BRLTNDG-MW01D	BRLTNDG-MW01D-02	07/12/2019	N	<0.91 R	**5.7**	<1.8 U	<0.91 U	<1.1 U	**8.3**	<0.91 U	<0.91 U	<0.91 U
DG	BRLTNDG-MW01S	BRLTNDG-MW01S-01	06/18/2019	N	<1.8 UJ	<1.8 U	<1.8 U	<2.1 U	<2.1 U	**20**	<1.1 U	<1.1 U	<2.0 U
DG	BRLTNDG-MW01S	BRLTNDG-MW01S-02	07/11/2019	N	<0.92 U	<3.7 U	<1.8 U	<0.92 U	<1.1 U	**21**	<0.92 U	<0.92 U	<0.92 U
DG	BRLTNDG-MW02S	BRLTNDG-MW02S-01	07/11/2019	N	<0.93 U	<3.7 U	<1.9 U	<0.93 U	<1.1 U	**400**	<0.93 U	<0.93 U	<0.93 U
DG	BRLTNDG-MW02S	BRLTNDG-MW02S-02	07/13/2019	N	<0.91 U	<3.6 U	<1.8 U	<0.91 U	<1.1 U	**390**	<0.91 U	<0.91 U	<0.91 U

Table 5
Summary of Groundwater Analytical Results
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AOC	LOCID	Sample ID	Sample Date	Sample Type[1]	PFHpS (ng/L)	PFHxA (ng/L)	PFNS (ng/L)	PFOSA (ng/L)	PFPeA (ng/L)	PFPeS (ng/L)	PFTeA (ng/L)	PFTriA (ng/L)	PFUnA (ng/L)
				PAL	NA	NA	NA	NA	NA	NA	NA	NA	NA
2	MW-405	MW-405-02	06/29/2019	N	1.8 J	110	<2.1 U	<2.6 UJ	67	34	<1.1 U	<1.1 U	<1.1 U
2	V4-BR03	V4-BR03-01	06/14/2019	N	<0.94 U	<1.0 U	<2.0 U	<2.5 U	<4.1 U	<0.94 U	<1.0 U	<1.0 U	<1.0 U
2	V4-BR03	V4-BR03-02	07/11/2019	N	<0.92 U	<1.8 U	<0.92 U	<0.92 U	<0.92 U	1.1 J	<0.92 U	<0.92 U	<0.92 U
2	V4-MW413	V4-MW413-01	06/03/2019	N	2.1	56	<2.2 U	14	53	21	<1.1 U	<1.1 U	<1.1 U
2	V4-MW413	V4-MW413-02	06/30/2019	N	1.9	56	<2.0 U	13	61	22	<1.1 U	<1.1 U	<1.1 U
2	V4-MW414	V4-MW414-01	06/14/2019	N	<1.0 U	<1.1 U	<2.1 U	<2.6 U	<4.4 U	<1.0 U	<1.1 U	<1.1 U	<1.1 U
2	V4-MW414	V4-MW414-02	07/11/2019	N	<0.92 U	<1.8 U	<0.92 U	<1.8 U	<0.92 U	<0.92 U	<0.92 R	<0.92 U	<0.92 U
2	V4-MW-5	V4-MW-5-01	06/11/2019	N	4.3	61	<2.1 U	26	34	29	<1.1 U	<1.1 U	<1.1 U
2	V4-MW-5	V4-MW-5-02	06/30/2019	N	4.6	54	<2.3 U	20	33	30	<1.2 U	<1.2 U	0.55 J
3	BRLTN03-MW01D	BRLTN03-MW01D-01	06/17/2019	N	<1.0 U	<1.1 U	<2.1 U	<2.6 U	<4.4 U	<1.0 U	<1.1 U	<1.1 U	<1.1 U
3	BRLTN03-MW01D	BRLTN03-MW01D-02	07/12/2019	N	<0.91 U	10	<0.91 U	<0.91 U	1.0 J	<0.91 U	<0.91 U	<0.91 U	0.57 J
3	BRLTN03-MW01S	BRLTN03-MW01S-01	06/15/2019	N	890	6,500	<21 U	<26 U	2,600	3,500 J	<11 U	<11 U	<11 U
3	BRLTN03-MW01S	BRLTN03-MW01S-02	07/10/2019	N	960	5,800	<8.8 U	<8.8 UJ	2,400	4,100	<8.8 U	<8.8 U	<8.8 U
4	BRLTN04-MW01D	BRLTN04-MW01D-01	07/11/2019	N	<2.5 U	7.4	<2.5 U	<2.5 U	3.7 J	<2.5 U	<2.5 U	<2.5 U	<2.5 U
4	BRLTN04-MW01D	BRLTN04-MW01D-02	07/14/2019	N	<1.0 U	<2.0 U	<1.0 U	<1.0 UJ	<1.0 U	<1.0 U	<1.0 U	<1.0 U	<1.0 U
4	BRLTN04-MW01S	BRLTN04-MW01S-01	06/29/2019	N	28	120	<2.1 U	1.5 J	86	34	<1.1 U	<1.1 U	<1.1 U
4	BRLTN04-MW01S	BRLTN04-MW01S-91	06/29/2019	FD	26	120	<2.0 U	1.3 J	87	33	<1.1 U	<1.1 U	<1.1 U
4	BRLTN04-MW01S	BRLTN04-MW01S-02	07/12/2019	N	110	160	<0.89 U	3.7	120	41	<0.89 U	<0.89 U	<0.89 U
4	BRLTN04-MW01S	BRLTN04-MW01S-92	07/12/2019	FD	100	150	<0.88 U	4.0	110	43	<0.88 R	<0.88 U	<0.88 U
5	BTV-MW-9	BTV-MW-9-01	06/12/2019	N	1.9	20	<2.1 U	<2.7 U	15	7.9	<1.1 U	<1.1 U	<1.1 U
5	BTV-MW-9	BTV-MW-9-02	07/11/2019	N	1.5 J	28	<0.90 U	<0.90 U	19	8.8	<0.90 U	<0.90 U	<0.90 U
6	AASF06-MW01S	AASF06-MW01S-01	07/01/2019	N	<1.0 U	3.9	<2.1 U	<2.7 U	2.7 J	0.63 J	<1.1 U	<1.1 U	<1.1 U
6	AASF06-MW01S	AASF06-MW01S-02	07/16/2019	N	<1.2 UJ	3.7	<1.2 UJ	<1.2 U	2.6	<1.2 UJ	<1.2 R	<1.2 UJ	<1.2 U
6	AASF06-MW02S	AASF06-MW02S-01	06/25/2019	N	<0.97 U	3.9	<2.0 U	<2.6 U	4.6 J	0.66 J	<1.1 U	<1.1 U	<1.1 U
6	AASF06-MW02S	AASF06-MW02S-02	07/16/2019	N	<0.89 UJ	5.2	<0.89 UJ	<0.89 U	7.5	0.51 J	<0.89 R	<0.89 UJ	<0.89 U
6	AASF06-MW03S	AASF06-MW03S-01	06/16/2019	N	<0.97 U	110	<2.0 U	<2.6 U	160	2.4 J	<1.1 R	<1.1 U	<1.1 U
6	AASF06-MW03S	AASF06-MW03S-02	07/12/2019	N	<0.91 U	270	<0.91 U	<0.91 U	640	0.81 J	<0.91 R	<0.91 U	<0.91 U
DG	BRLTNDG-MW01D	BRLTNDG-MW01D-01	06/18/2019	N	<0.98 U	6.1	<2.1 U	<2.6 U	4.5 J	2.0	<1.1 U	<1.1 U	<1.1 U
DG	BRLTNDG-MW01D	BRLTNDG-MW01D-02	07/12/2019	N	<0.91 U	4.6	<0.91 U	<0.91 UJ	4.0	1.8 J	<0.91 U	<0.91 U	<0.91 U
DG	BRLTNDG-MW01S	BRLTNDG-MW01S-01	06/18/2019	N	<0.97 U	14	<2.0 U	<2.5 U	6.5	11	<1.1 R	<1.1 U	<1.1 U
DG	BRLTNDG-MW01S	BRLTNDG-MW01S-02	07/11/2019	N	<0.92 U	20	<0.92 U	<0.92 U	8.8	8.8	<0.92 U	<0.92 U	<0.92 U
DG	BRLTNDG-MW02S	BRLTNDG-MW02S-01	07/11/2019	N	0.64 J	65	<0.93 U	<0.93 U	34	15 R	<0.93 U	<0.93 U	<0.93 U
DG	BRLTNDG-MW02S	BRLTNDG-MW02S-02	07/13/2019	N	0.70 J	63	<0.91 U	<0.91 UJ	32	15 R	<0.91 U	<0.91 U	<0.91 U

Table 5
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AOC	LOCID	Sample ID	Sample Date	Sample Type[1]	PFBS (ng/L)	PFHpA (ng/L)	PFHxS (ng/L)	PFNA (ng/L)	PFOA (ng/L)	PFOS (ng/L)	SUM of PFHpA + PFHxS + PFNA + PFOA + PFOS (ng/L)
				PAL	400,000[2]	20[3]	20[3]	20[3]	20[3]	20[3]	20[3]
2	MW-405	MW-405-02	06/29/2019	N	29	35	350	<1.1 U	55	390	830
2	V4-BR03	V4-BR03-01	06/14/2019	N	<0.94 U	<1.0 U	<0.94 U	<1.0 U	<1.0 U	<1.0 U	ND
2	V4-BR03	V4-BR03-02	07/11/2019	N	<1.8 U	<0.92 U	8.4	<0.92 U	<1.8 U	18	26.4
2	V4-MW413	V4-MW413-01	06/03/2019	N	17	26	120	0.56 J	19	110	275.56 J
2	V4-MW413	V4-MW413-02	06/30/2019	N	21	21	110	0.72 J	15	140	286.72 J
2	V4-MW414	V4-MW414-01	06/14/2019	N	<1.0 U	<1.1 U	<1.8 U	<1.1 U	<1.1 U	2.5	2.5
2	V4-MW414	V4-MW414-02	07/11/2019	N	<0.92 U	<0.92 U	<1.8 U	<0.92 U	<1.8 U	<3.7 U	ND
2	V4-MW-5	V4-MW-5-01	06/11/2019	N	20	26	160	2.8	24	200	412.8
2	V4-MW-5	V4-MW-5-02	06/30/2019	N	20	24	150	3.3	23	230	430.3
3	BRLTN03-MW01D	BRLTN03-MW01D-01	06/17/2019	N	<1.0 U	<1.1 U	<1.8 U	<1.1 U	<1.1 U	2.2	2.2
3	BRLTN03-MW01D	BRLTN03-MW01D-02	07/12/2019	N	<1.8 U	<1.8 U	<1.8 U	<0.91 U	<1.8 U	3.6	3.6
3	BRLTN03-MW01S	BRLTN03-MW01S-01	06/15/2019	N	6,400	890	6,400	55	660	22,000	30,005
3	BRLTN03-MW01S	BRLTN03-MW01S-02	07/10/2019	N	5,700	820	7,700	77	680	32,000	41,277
4	BRLTN04-MW01D	BRLTN04-MW01D-01	07/11/2019	N	<5.0 U	<5.0 U	12	<2.5 U	<5.0 U	43	55
4	BRLTN04-MW01D	BRLTN04-MW01D-02	07/14/2019	N	<1.0 U	<1.0 U	<2.0 U	<1.0 U	<1.0 U	2.6	2.6
4	BRLTN04-MW01S	BRLTN04-MW01S-01	06/29/2019	N	15	40	470	6.9	45	1,200	1,761.9
4	BRLTN04-MW01S	BRLTN04-MW01S-91	06/29/2019	FD	15	41	170	6.5	40	450	707.5
4	BRLTN04-MW01S	BRLTN04-MW01S-02	07/12/2019	N	16	50	1,200	35	93	8,000	9,378
4	BRLTN04-MW01S	BRLTN04-MW01S-92	07/12/2019	FD	16	48	1,300	38	89	8,500	9,975
5	BTV-MW-9	BTV-MW-9-01	06/12/2019	N	4.6	6.5	51	1.2 J	16	7.2	81.9 J
5	BTV-MW-9	BTV-MW-9-02	07/11/2019	N	4.4	7.2	50	0.76 J	17	<5.5 U	74.96 J
6	AASF06-MW01S	AASF06-MW01S-01	07/01/2019	N	0.93 J	1.7 J	5.6	0.41 J	2.5	16	26.21 J
6	AASF06-MW01S	AASF06-MW01S-02	07/16/2019	N	0.99 J	1.7 J	6.7	<1.2 U	3.1 J	8.5 J	20 J
6	AASF06-MW02S	AASF06-MW02S-01	06/25/2019	N	2.0	2.2	6.8	<1.1 U	5.2	2.2	16.4
6	AASF06-MW02S	AASF06-MW02S-02	07/16/2019	N	1.8	2.2 J	4.8	<0.89 U	3.8 J	2.1 J	12.9 J
6	AASF06-MW03S	AASF06-MW03S-01	06/16/2019	N	80	62	13	1.8	45	4.1 J	125.9 J
6	AASF06-MW03S	AASF06-MW03S-02	07/12/2019	N	10	75	7.4	6.0	61	4.7	154.1
DG	BRLTNDG-MW01D	BRLTNDG-MW01D-01	06/18/2019	N	1.9	3.3	22	<1.1 U	14	<1.8 U	39.3
DG	BRLTNDG-MW01D	BRLTNDG-MW01D-02	07/12/2019	N	<1.8 U	2.5	18	<0.91 U	11	<1.8 U	31.5
DG	BRLTNDG-MW01S	BRLTNDG-MW01S-01	06/18/2019	N	4.6	3.3	120	<1.1 U	3.3	<1.1 U	126.6
DG	BRLTNDG-MW01S	BRLTNDG-MW01S-02	07/11/2019	N	4.9	3.5	190	<0.92 U	3.6	<1.8 U	197.1
DG	BRLTNDG-MW02S	BRLTNDG-MW02S-01	07/11/2019	N	15 R	14	69	<0.93 U	14	<2.5 U	97
DG	BRLTNDG-MW02S	BRLTNDG-MW02S-02	07/13/2019	N	14 R	14	74	<0.91 U	13	2.3	103.3

Table 5
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AOC	LOCID	Sample ID	Sample Date	Sample Type[1]	4:2FTS (ng/L)	6:2FTS (ng/L)	8:2FTS (ng/L)	NEtFOSAA (ng/L)	NMeFOSAA (ng/L)	PFBA (ng/L)	PFDA (ng/L)	PFDoA (ng/L)	PFDS (ng/L)
				PAL	NA	NA	NA	NA	NA	NA	NA	NA	NA
DG	BRLTNDG-MW03D	BRLTNDG-MW03D-01	07/11/2019	N	<0.92 U	<3.7 U	<1.8 U	<0.92 U	<1.1 U	**21**	<0.92 U	<0.92 U	<0.92 U
DG	BRLTNDG-MW03D	BRLTNDG-MW03D-02	07/13/2019	N	<0.89 U	<3.6 U	<1.8 U	<0.89 U	<1.1 U	**14**	<0.89 U	<0.89 U	<0.89 U
DG	BRLTNDG-MW03S	BRLTNDG-MW03S-01	07/12/2019	N	<0.93 U	**2.2 J**	<1.9 U	<0.93 U	<1.1 U	**47**	<0.93 U	<0.93 U	<0.93 U
DG	BRLTNDG-MW03S	BRLTNDG-MW03S-02	07/14/2019	N	<0.91 U	**33**	<1.8 U	<0.91 U	<1.1 U	**29**	<0.91 U	<0.91 U	<0.91 U
DG	BRLTNDG-MW04D	BRLTNDG-MW04D-01	07/09/2019	N	<0.91 U	<3.7 U	<1.8 U	<0.91 U	<1.1 U	**8.9**	<0.91 U	<0.91 U	<0.91 U
DG	BRLTNDG-MW04D	BRLTNDG-MW04D-02	07/12/2019	N	<0.88 U	<3.5 U	<1.8 U	<0.88 U	<1.1 U	**9.1 J**	<0.88 U	<0.88 U	<0.88 UJ
DG	BRLTNDG-MW04S	BRLTNDG-MW04S-01	07/08/2019	N	<1.8 U	**1.0 J**	<1.8 U	**1.2 J**	<2.2 U	**140**	<1.1 U	<1.1 U	<2.1 U
DG	BRLTNDG-MW04S	BRLTNDG-MW04S-02	07/12/2019	N	<0.89 U	<3.6 U	<1.8 U	**0.77 J**	<1.1 U	**120**	<0.89 U	<0.89 U	<0.89 U
DG	BRLTNDG-MW05D	BRLTNDG-MW05D-01	07/12/2019	N	<0.93 U	**3.6 J**	<1.9 U	<0.93 U	<1.1 U	**67**	<0.93 U	<0.93 U	<0.93 U
DG	BRLTNDG-MW05D	BRLTNDG-MW05D-02	07/14/2019	N	<0.90 U	**3.3 J**	<1.8 U	<0.90 U	<1.1 U	**33**	<0.90 U	<0.90 U	<0.90 U
DG	BRLTNDG-MW05S	BRLTNDG-MW05S-01	07/09/2019	N	**1.1 J**	<3.6 U	<1.8 U	<0.90 U	<1.1 U	**42**	<0.90 U	<0.90 U	<0.90 U
DG	BRLTNDG-MW05S	BRLTNDG-MW05S-02	07/13/2019	N	**1.5 J**	<3.6 U	<1.8 U	<0.89 U	<1.1 U	**47**	<0.89 U	<0.89 U	<0.89 U
DG	Well 59	Well59-01	06/11/2019	N	<1.9 U	**3.1**	<1.9 U	<2.3 U	<2.3 U	**20**	<1.2 U	<1.2 U	<2.2 U
DG	Well 59	Well59-91	06/11/2019	FD	<1.9 U	**3.7**	<1.9 U	<2.3 U	<2.3 U	**20**	<1.2 U	<1.2 U	<2.2 U
DG	Well 59	Well59-02	06/30/2019	N	<2.0 U	**2.2 J**	<2.0 U	<2.4 U	<2.4 U	**20**	<1.2 U	<1.2 U	<2.3 U
UP	BRLTNUP-MW01D	BRLTNUP-MW01D-01	07/10/2019	N	<0.90 U	**5.4**	<1.8 U	<0.90 U	<1.1 U	**8.2**	<0.90 U	<0.90 U	<0.90 U
UP	BRLTNUP-MW01D	BRLTNUP-MW01D-02	07/13/2019	N	<0.84 U	**3.4 J**	<1.7 U	<0.84 U	<1.0 U	**7.7**	<0.84 U	<0.84 U	<0.84 U
UP	BTV-MW-5	BTV-MW-5-01	06/11/2019	N	<1.8 U	<1.8 U	<1.8 U	<2.2 U	<2.2 U	**55**	<1.1 U	<1.1 U	<2.1 U
UP	BTV-MW-5	BTV-MW-5-91	06/11/2019	FD	<1.8 UJ	<1.8 U	<1.8 U	<2.2 U	<2.2 U	**56**	<1.1 U	<1.1 U	<2.1 U
UP	BTV-MW-5	BTV-MW-5-02	06/29/2019	N	<1.8 U	<1.8 U	<1.8 U	<2.1 U	<2.1 U	**60**	<1.1 U	<1.1 U	<2.0 U
UP	BTV-MW-5	BTV-MW-5-92	06/29/2019	FD	<1.8 U	<1.8 U	<1.8 U	<2.2 U	<2.2 U	**57**	<1.1 U	<1.1 U	<2.1 U

Table 5
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AOC	LOCID	Sample ID	Sample Date	Sample Type[1]	PFHpS (ng/L)	PFHxA (ng/L)	PFNS (ng/L)	PFOSA (ng/L)	PFPeA (ng/L)	PFPeS (ng/L)	PFTeA (ng/L)	PFTriA (ng/L)	PFUnA (ng/L)
				PAL	NA	NA	NA	NA	NA	NA	NA	NA	NA
DG	BRLTNDG-MW03D	BRLTNDG-MW03D-01	07/11/2019	N	**0.99 J**	**15**	<0.92 U	<0.92 U	**4.8**	**3.3**	<0.92 U	<0.92 U	<0.92 U
DG	BRLTNDG-MW03D	BRLTNDG-MW03D-02	07/13/2019	N	**0.98 J**	**13**	<0.89 U	**0.46 J**	**4.1**	**3.3**	<0.89 U	<0.89 U	<0.89 U
DG	BRLTNDG-MW03S	BRLTNDG-MW03S-01	07/12/2019	N	<0.93 U	**5.0**	<0.93 U	**1.1 J**	**0.98 J**	**1.5 J**	<0.93 U	<0.93 U	<0.93 U
DG	BRLTNDG-MW03S	BRLTNDG-MW03S-02	07/14/2019	N	<0.91 U	**6.6**	<0.91 U	**1.6 J**	**1.2 J**	**2.0**	<0.91 U	<0.91 U	<0.91 U
DG	BRLTNDG-MW04D	BRLTNDG-MW04D-01	07/09/2019	N	<0.91 U	**29**	<0.91 U	<0.91 UJ	**15**	**3.6**	<0.91 U	<0.91 U	<0.91 U
DG	BRLTNDG-MW04D	BRLTNDG-MW04D-02	07/12/2019	N	<0.88 UL	**31**	<0.88 UL	<0.88 UJ	**16**	**3.6**	<0.88 R	<0.88 UJ	<0.88 U
DG	BRLTNDG-MW04S	BRLTNDG-MW04S-01	07/08/2019	N	**0.61 J**	**26**	<2.1 U	<2.6 U	**6.6**	**13 R**	<1.1 U	<1.1 U	<1.1 U
DG	BRLTNDG-MW04S	BRLTNDG-MW04S-02	07/12/2019	N	**0.52 J**	**29**	<0.89 U	<0.89 U	**11 R**	**14 R**	<0.89 U	<0.89 U	<0.89 U
DG	BRLTNDG-MW05D	BRLTNDG-MW05D-01	07/12/2019	N	<0.93 U	**1.3 J**	<0.93 U	<0.93 UJ	**1.6 J**	<0.93 U	<0.93 R	<0.93 U	<0.93 U
DG	BRLTNDG-MW05D	BRLTNDG-MW05D-02	07/14/2019	N	<0.90 U	**1.1 J**	<0.90 U	**0.59 J**	**1.7 J**	<0.90 U	<0.90 U	<0.90 U	<0.90 U
DG	BRLTNDG-MW05S	BRLTNDG-MW05S-01	07/09/2019	N	<0.90 U	**11**	<0.90 U	<0.90 UJ	**6.9**	**1.6 J**	<0.90 U	<0.90 U	<0.90 U
DG	BRLTNDG-MW05S	BRLTNDG-MW05S-02	07/13/2019	N	<0.89 U	**12**	<0.89 U	<0.89 UJ	**7.5**	**1.8**	<0.89 U	<0.89 U	<0.89 U
DG	Well 59	Well59-01	06/11/2019	N	**4.3**	**35**	<2.2 U	**2.1 J**	**17**	**23**	<1.2 U	<1.2 U	<1.2 U
DG	Well 59	Well59-91	06/11/2019	FD	**4.5**	**33**	<2.2 U	**1.6 J**	**17**	**22**	<1.2 U	<1.2 U	<1.2 U
DG	Well 59	Well59-02	06/30/2019	N	**4.7**	**35**	<2.3 U	**2.2 J**	**19**	**22**	<1.2 U	<1.2 U	<1.2 U
UP	BRLTNUP-MW01D	BRLTNUP-MW01D-01	07/10/2019	N	<0.90 U	**14**	<0.90 U	<0.90 UJ	**11**	**4.0**	<0.90 U	<0.90 U	<0.90 U
UP	BRLTNUP-MW01D	BRLTNUP-MW01D-02	07/13/2019	N	<0.84 U	**13**	<0.84 U	<0.84 UJ	**11**	**3.9**	<0.84 U	<0.84 U	<0.84 U
UP	BTV-MW-5	BTV-MW-5-01	06/11/2019	N	**0.45 J**	**42**	<2.1 U	<2.7 U	**50**	**3.9**	<1.1 U	<1.1 U	<1.1 U
UP	BTV-MW-5	BTV-MW-5-91	06/11/2019	FD	**0.51 J**	**44**	<2.1 U	<2.6 U	**49**	**3.6**	<1.1 U	<1.1 U	<1.1 U
UP	BTV-MW-5	BTV-MW-5-02	06/29/2019	N	**0.61 J**	**36**	<2.0 U	<2.6 U	**50**	**4.0**	<1.1 U	<1.1 U	<1.1 U
UP	BTV-MW-5	BTV-MW-5-92	06/29/2019	FD	**0.55 J**	**33**	<2.1 U	<2.6 U	**48**	**3.6**	<1.1 U	<1.1 U	<1.1 U

Table 5
Summary of Groundwater Analytical Results
Expanded Site Inspection Report for PFAS
Burlington ANGB, South Burlinton, Vermont

AOC	LOCID	Sample ID	Sample Date	Sample Type[1]	PFBS (ng/L)	PFHpA (ng/L)	PFHxS (ng/L)	PFNA (ng/L)	PFOA (ng/L)	PFOS (ng/L)	SUM of PFHpA + PFHxS + PFNA + PFOA + PFOS (ng/L)
				PAL	400,000[2]	20[3]	20[3]	20[3]	20[3]	20[3]	20[3]
DG	BRLTNDG-MW03D	BRLTNDG-MW03D-01	07/11/2019	N	**3.3**	**3.8**	**98**	<0.92 U	**17**	**23**	**141.8**
DG	BRLTNDG-MW03D	BRLTNDG-MW03D-02	07/13/2019	N	**3.1**	**3.4**	**91**	<0.89 U	**16**	**23**	**133.4**
DG	BRLTNDG-MW03S	BRLTNDG-MW03S-01	07/12/2019	N	**2.0**	**1.2 J**	**46**	**0.90 J**	**2.5**	**9.8**	**60.4 J**
DG	BRLTNDG-MW03S	BRLTNDG-MW03S-02	07/14/2019	N	**2.2**	**1.3 J**	**46**	**0.91 J**	**2.2**	**14**	**64.41 J**
DG	BRLTNDG-MW04D	BRLTNDG-MW04D-01	07/09/2019	N	**15**	**2.3**	**7.1**	<0.91 U	**2.0**	**1.5 J**	**12.9 J**
DG	BRLTNDG-MW04D	BRLTNDG-MW04D-02	07/12/2019	N	**15 J**	**3.0**	**9.1 J**	<0.88 U	**2.1 J**	**3.8**	**18 J**
DG	BRLTNDG-MW04S	BRLTNDG-MW04S-01	07/08/2019	N	**10 R**	**6.9**	**50**	**1.7 J**	**21**	**18 J**	**97.6 J**
DG	BRLTNDG-MW04S	BRLTNDG-MW04S-02	07/12/2019	N	**9.9 R**	**6.1**	**47**	**1.5 J**	**20**	**13**	**87.6 J**
DG	BRLTNDG-MW05D	BRLTNDG-MW05D-01	07/12/2019	N	<0.93 U	<0.93 U	<0.93 U	<0.93 U	**0.51 J**	**0.74 J**	**1.25 J**
DG	BRLTNDG-MW05D	BRLTNDG-MW05D-02	07/14/2019	N	<0.90 U	<0.90 U	<0.90 U	<0.90 U	**0.49 J**	**1.1 J**	**1.59 J**
DG	BRLTNDG-MW05S	BRLTNDG-MW05S-01	07/09/2019	N	**5.9**	**3.0**	**26**	<0.90 U	**8.1**	**9.6**	**46.7**
DG	BRLTNDG-MW05S	BRLTNDG-MW05S-02	07/13/2019	N	**6.6**	**3.1**	**27**	<0.89 U	**8.5**	**20**	**58.6**
DG	Well 59	Well59-01	06/11/2019	N	**18**	**8.3**	**130**	**0.71 J**	**21**	**83**	**243.01 J**
DG	Well 59	Well59-91	06/11/2019	FD	**18**	**8.5**	**140**	**0.76 J**	**21**	**78**	**248.26 J**
DG	Well 59	Well59-02	06/30/2019	N	**19**	**8.3**	**140**	**0.73 J**	**21**	**87**	**257.03 J**
UP	BRLTNUP-MW01D	BRLTNUP-MW01D-01	07/10/2019	N	**3.3**	**6.4**	**23**	<0.90 U	**2.2**	**7.3**	**38.9**
UP	BRLTNUP-MW01D	BRLTNUP-MW01D-02	07/13/2019	N	**3.1**	**6.3**	**21**	<0.84 U	**2.0**	**0.57 J**	**29.87 J**
UP	BTV-MW-5	BTV-MW-5-01	06/11/2019	N	**3.8**	**64**	**97**	**0.82 J**	**61**	**2.4**	**225.22 J**
UP	BTV-MW-5	BTV-MW-5-91	06/11/2019	FD	**3.7**	**60**	**94**	**0.92 J**	**62**	**2.4**	**219.32 J**
UP	BTV-MW-5	BTV-MW-5-02	06/29/2019	N	**4.3**	**55**	**100**	**1.1 J**	**61**	**3.4**	**220.5 J**
UP	BTV-MW-5	BTV-MW-5-92	06/29/2019	FD	**4.1**	**57**	**110**	**1.1 J**	**66**	**3.4**	**237.5 J**

Notes:

[1] N - Normal field sample. FD - Field duplicate of sample above.

[2] USEPA RSL - USEPA Regional Screening Level, Tap Water, HQ=1.0, updated May 2018; available at https://semspub.epa.gov/work/HQ/197235.pdf.

[3] VT PAL - Vermont Groundwater Protection Rule; Chapter 12; Appendix 1, Groundwater Enforcement Standard. Adopted July 11, 2018; available at: https://dec.vermont.gov/sites/dec/files/dwgwp/DW/Groundwater%20Protection%20Rule%20and%20Strategy.pdf.

Detections are bolded.

Results equal to or exceeding the PAL are highlighted yellow.

J - Analyte detected, estimated concentration.

NA - No screening level available.

ND - There were no detections in the PFAS Summation.

ng/L - nanograms per liter.

R - Rejected due to serious quality control deficiencies. Result is unusable.

U - Analyte not detected. Result reported as < LOD (Limit of Detection).

UJ - Analyte not detected. LOD is approximate.

Table 6
Summary of Surface Water Analytical Results
Expanded Site Inspection Report for PFAS
Burlington ANGB, South Burlinton, Vermont

AOC	LOCID	Sample ID	Sample Date	Sample Type[1]	4:2FTS (ng/L)	6:2FTS (ng/L)	8:2FTS (ng/L)	NEtFOSAA (ng/L)	NMeFOSAA (ng/L)	PFBA (ng/L)	PFDA (ng/L)	PFDoA (ng/L)	PFDS (ng/L)	PFHpS (ng/L)	PFHxA (ng/L)	PFNS (ng/L)	PFOSA (%ng/l)	PFPeA (ng/L)
				PAL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
DG	BRLTNDG-001-SW	BRLTNDG-001-SW	06/13/2019	N	<2.0 U	<2.0 U	<2.0 U	<2.4 U	<2.4 U	34 J	<1.2 U	<1.2 R	<2.3 U	0.70 J	180	<2.3 U	1.1 J	55
DG	BRLTNDG-002-SW	BRLTNDG-002-SW	06/10/2019	N	<1.7 U	49	4.8 J	<2.1 R	<2.1 UJ	10	<1.0 U	<1.0 R	<2.0 U	7.1	31	<2.0 U	1.0 J	16
DG	BRLTNDG-003-SW	BRLTNDG-003-SW	06/13/2019	N	<1.9 U	39	19 J	<2.2 U	<2.2 U	45 J	0.59 J	<1.1 R	<2.1 U	4.7	140	<2.1 U	28 J	78
DG	BRLTNDG-004-SW	BRLTNDG-004-SW	06/13/2019	N	<1.8 U	31	10	<2.2 U	<2.2 U	63 J	1.3 J	<1.1 U	<2.1 U	12	100	0.76 J	47 J	70
DG	BRLTNDG-005-SW	BRLTNDG-005-SW	06/13/2019	N	2.2 J	94	<1.7 U	<2.1 U	<2.1 U	180 J	<1.0 U	<1.0 U	<2.0 U	250 J	910	<2.0 U	<2.5 U	330
DG	BRLTNDG-006-SW	BRLTNDG-006-SW	06/13/2019	N	<18 U	2,500	14 J	<22 U	<22 U	160 J	<11 U	<11 U	<21 U	270	520	<21 U	<27 U	330
DG	BRLTNDG-008-SW	BRLTNDG-008-SW	06/13/2019	N	<18 U	430	<18 U	<21 U	<21 U	260 J	<11 U	<11 U	<20 U	280 J	1,700	<20 U	14 J	520
DG	BRLTNDG-009-SW	BRLTNDG-009-SW	06/13/2019	N	<2.0 U	1.1 J	<2.0 U	<2.4 U	<2.4 U	54 J	<1.2 U	<1.2 R	<2.3 U	3.4	35	<2.3 U	<2.9 UJ	28
DG	BRLTNDG-010-SW	BRLTNDG-010-SW	06/13/2019	N	<1.7 U	110	9.2	<2.1 U	<2.1 U	58 J	<1.0 U	<1.0 U	<2.0 U	30	100	0.89 J	4.3 J	54
DG	BRLTNDG-011-SW	BRLTNDG-011-SW	06/10/2019	N	<1.9 U	110	2.5 J	<2.2 R	<2.2 R	54	<1.1 UJ	<1.1 R	<2.2 UJ	15	97	<2.2 UJ	2.9 R	57
DG	BRLTNDG-012-SW	BRLTNDG-012-SW	06/10/2019	N	<1.7 U	22	1.0 J	<2.1 R	<2.1 UJ	54	<1.0 U	<1.0 R	<2.0 U	11	51	<2.0 U	<2.5 UJ	40
DG	BRLTNDG-013-SW	BRLTNDG-013-SW	06/13/2019	N	<1.6 U	120	15	<2.0 U	<2.0 U	59 J	<0.99 U	<0.99 U	<1.9 U	36	110	1.4 J	5.2 J	54
DG	BRLTNDG-014-SW	BRLTNDG-014-SW	06/10/2019	N	<1.7 U	<2.6 U	<1.7 UJ	<2.0 R	<2.0 R	29	<1.0 UJ	<1.0 R	<2.0 UJ	1.1 J	68	<2.0 UJ	1.4 J	44
DG	BRLTNDG-014-SW	BRLTNDG-914-SW	06/10/2019	FD	<1.8 U	<2.7 U	<1.8 U	<2.2 UJ	<2.2 UJ	29	<1.1 U	<1.1 R	<2.1 U	1.5 J	68	<2.1 U	0.98 J	41
DG	BRLTNDG-015-SW	BRLTNDG-015-SW	07/09/2019	N	<0.91 U	<3.6 U	<1.8 U	<0.91 U	<1.1 U	3.0 J	<0.91 U	<0.91 U	<0.91 U	<0.91 U	1.2 J	<0.91 U	<0.91 UJ	1.4 J
DG	BRLTNDG-015-SW	BRLTNDG-915-SW	07/09/2019	FD	<0.90 U	<3.6 U	<1.8 U	<0.90 U	<1.1 U	3.1 J	<0.90 U	<0.90 U	<0.90 U	<0.90 U	1.2 J	<0.90 U	<0.90 UJ	1.5 J
DG	BRLTNDG-016-SW	BRLTNDG-016-SW	07/08/2019	N	<1.8 U	2.4 J	<1.8 U	<2.1 U	<2.1 U	3.1 J	<1.1 U	<1.1 U	<2.0 U	<0.96 U	1.7 J	<2.0 U	<2.5 U	<4.2 U
DG	BRLTNDG-017-SW	BRLTNDG-017-SW	07/08/2019	N	<1.7 U	<1.7 U	<1.7 U	<2.1 U	<2.1 U	2.6 J	<1.0 U	<1.0 U	<2.0 U	<0.96 U	1.3 J	<2.0 U	<2.5 U	<4.2 U
DG	BRLTNDG-018-SW	BRLTNDG-018-SW	07/08/2019	N	<1.9 U	<1.9 UJ	<1.9 U	<2.3 U	<2.3 U	2.0 J	<1.1 U	<1.1 U	<2.2 U	<1.1 U	1.1 J	<2.2 U	<2.8 U	<4.6 U
DG	BRLTNDG-018-SW	BRLTNDG-918-SW	07/08/2019	FD	<1.9 U	3.2 J	<1.9 U	<2.3 U	<2.3 U	2.8 J	<1.1 U	<1.1 U	<2.2 U	<1.0 U	1.2 J	<2.2 U	<2.8 U	<4.6 U
DG	BRLTNDG-019-SW	BRLTNDG-019-SW	07/09/2019	N	<0.89 U	<3.6 U	<1.8 U	<0.89 U	<1.1 U	26	<0.89 U	<0.89 U	<0.89 U	<0.89 U	11	<0.89 U	<0.89 UJ	7.2
DG	BRLTNDG-020-SW	BRLTNDG-020-SW	07/09/2019	N	<0.97 U	<3.9 U	<1.9 U	<0.97 U	<1.2 U	26	<0.97 U	<0.97 U	<0.97 U	12	19	<0.97 U	<0.97 UJ	8.6
DG	BRLTNDG-021-SW	BRLTNDG-021-SW	07/09/2019	N	<0.93 U	<3.7 U	<1.9 U	<0.93 U	<1.1 U	49	<0.93 U	<0.93 U	<0.93 U	2.3	16	<0.93 U	<0.93 UJ	10
DG	BRLTNDG-022-SW	BRLTNDG-022-SW	07/09/2019	N	<0.98 U	<3.9 U	<2.0 U	<0.98 U	<1.2 U	33	<0.98 U	<0.98 U	<0.98 U	7.7	32	<0.98 U	<0.98 UJ	19
DG	BRLTNDG-023-SW	BRLTNDG-023-SW	07/08/2019	N	<1.7 U	24	<1.7 U	<2.1 U	<2.1 U	63	<1.0 U	<1.0 U	<2.0 U	13	64	<2.0 U	<2.5 U	55
UP	BRLTNUP-001-SW	BRLTNUP-001-SW	07/11/2019	N	<1.8 U	1.1 J	<1.8 U	<2.1 U	<2.1 U	6.7	<1.1 U	<1.1 U	<2.0 U	<0.98 U	7.8	<2.0 U	<2.6 U	8.1
UP	BRLTNUP-002-SW	BRLTNUP-002-SW	07/08/2019	N	<1.8 U	1.0 J	<1.8 U	<2.1 U	<2.1 U	6.3	<1.1 U	<1.1 U	<2.0 U	<0.98 U	7.1	<2.0 U	<2.6 U	7.1
UP	BRLTNUP-003-SW	BRLTNUP-003-SW	07/08/2019	N	<1.9 U	5.4	<1.9 U	<2.3 U	<2.3 U	7.4	<1.1 U	<1.1 U	<2.2 U	<1.0 U	3.5	<2.2 U	<2.8 U	4.3 J
UP	BRLTNUP-004-SW	BRLTNUP-004-SW	07/11/2019	N	<1.8 U	<1.8 U	<1.8 U	<2.1 U	<2.1 U	2.8 J	<1.1 U	<1.1 U	<2.0 U	<0.97 U	<1.8 U	<2.0 U	<2.6 U	<4.2 U
UP	BRLTNUP-005-SW	BRLTNUP-005-SW	07/08/2019	N	<1.8 U	1.6 J	<1.8 U	<2.2 U	<2.2 U	7.2	<1.1 U	<1.1 UJ	<2.1 U	<0.99 U	8.2	<2.1 U	<2.6 U	8.0

Table 6
Summary of Surface Water Analytical Results
Expanded Site Inspection Report for PFAS
Burlington ANGB, South Burlinton, Vermont

AOC	LOCID	Sample ID	Sample Date	Sample Type[1]	PFPeS (ng/L)	PFTeA (ng/L)	PFTriA (ng/L)	PFUnA (ng/L)	PFBS (ng/L)	PFHpA (ng/L)	PFHxS (ng/L)	PFNA (ng/L)	PFOA (ng/L)	PFOS (ng/L)	SUM of PFHpA + PFHxS + PFNA + PFOA + PFOS (ng/L)
				PAL	NA	NA	NA	NA	400,000[2]	20[3]	20[3]	20[3]	20[3]	20[3]	20[3]
DG	BRLTNDG-001-SW	BRLTNDG-001-SW	06/13/2019	N	**150**	<1.2 R	<1.2 R	<1.2 UJ	**150**	**25**	**190**	<1.2 U	**24 J**	**3.1 J**	**242.1 J**
DG	BRLTNDG-002-SW	BRLTNDG-002-SW	06/10/2019	N	**20**	<1.0 R	<1.0 R	<1.0 R	**16**	**9.2**	**140**	**2.2 J**	**28**	**370 J**	**549.4 J**
DG	BRLTNDG-003-SW	BRLTNDG-003-SW	06/13/2019	N	**58**	<1.1 R	<1.1 R	<1.1 UJ	**33**	**79**	**220**	**4.6 J**	**56**	**71 J**	**430.6 J**
DG	BRLTNDG-004-SW	BRLTNDG-004-SW	06/13/2019	N	**43**	<1.1 UJ	<1.1 U	<1.1 U	**22**	**73**	**370**	**13**	**89**	**540**	**1,085**
DG	BRLTNDG-005-SW	BRLTNDG-005-SW	06/13/2019	N	**610**	<1.0 UJ	<1.0 U	<1.0 U	**540**	**150**	**3,900 J**	**28**	**460**	**3,600**	**8,138 J**
DG	BRLTNDG-006-SW	BRLTNDG-006-SW	06/13/2019	N	**200**	<11 U	<11 U	<11 U	**160**	**170**	**2,300**	**49**	**900**	**7,200**	**10,619**
DG	BRLTNDG-008-SW	BRLTNDG-008-SW	06/13/2019	N	**780**	<11 U	<11 U	<11 U	**640**	**250**	**5,300**	**16 J**	**840**	**7,000 J**	**13,406 J**
DG	BRLTNDG-009-SW	BRLTNDG-009-SW	06/13/2019	N	**17**	<1.2 R	<1.2 R	<1.2 UJ	**11**	**13**	**140**	**4.7 J**	**29 J**	**180 J**	**366.7 J**
DG	BRLTNDG-010-SW	BRLTNDG-010-SW	06/13/2019	N	**81**	<1.0 U	<1.0 U	<1.0 U	**42**	**22**	**370**	**4.3**	**57**	**1,400**	**1,853.3**
DG	BRLTNDG-011-SW	BRLTNDG-011-SW	06/10/2019	N	**62**	<1.1 U	<1.1 R	<1.1 R	**40**	**23**	**340**	**5.3 J**	**59 J**	**310 J**	**737.3 J**
DG	BRLTNDG-012-SW	BRLTNDG-012-SW	06/10/2019	N	**43**	<1.0 R	<1.0 R	<1.0 UJ	**19**	**19**	**330**	**3.8**	**42**	**260**	**654.8**
DG	BRLTNDG-013-SW	BRLTNDG-013-SW	06/13/2019	N	**82**	<0.99 U	<0.99 U	<0.99 U	**44**	**23**	**430**	**5.0**	**66**	**1,800**	**2,324**
DG	BRLTNDG-014-SW	BRLTNDG-014-SW	06/10/2019	N	**34**	<1.0 R	<1.0 R	<1.0 R	**35**	**26**	**140**	**2.1 J**	**23**	**110 J**	**301.1 J**
DG	BRLTNDG-014-SW	BRLTNDG-914-SW	06/10/2019	FD	**37**	<1.1 R	<1.1 R	<1.1 UJ	**35**	**26**	**150**	**1.9**	**23**	**93 J**	**293.9 J**
DG	BRLTNDG-015-SW	BRLTNDG-015-SW	07/09/2019	N	<0.91 U	<0.91 U	<0.91 U	<0.91 U	**0.98 J**	**0.58 J**	<0.91 U	<0.91 U	**0.70 J**	<0.91 U	**1.28 J**
DG	BRLTNDG-015-SW	BRLTNDG-915-SW	07/09/2019	FD	<0.90 U	<0.90 U	<0.90 U	<0.90 U	**1.0 J**	**0.55 J**	<0.90 U	<0.90 U	**0.71 J**	**0.88 J**	**2.14 J**
DG	BRLTNDG-016-SW	BRLTNDG-016-SW	07/08/2019	N	**0.36 J**	<1.1 R	<1.1 U	<1.1 U	**1.4 J**	**0.71 J**	**2.6**	<1.1 U	**1.1 J**	**3.9**	**8.31 J**
DG	BRLTNDG-017-SW	BRLTNDG-017-SW	07/08/2019	N	**0.39 J**	<1.0 U	<1.0 U	<1.0 U	**1.1 J**	**0.64 J**	**1.9**	<1.0 U	**1.0 J**	<2.5 UJ	**3.54 J**
DG	BRLTNDG-018-SW	BRLTNDG-018-SW	07/08/2019	N	<1.1 U	<1.1 U	<1.1 U	<1.1 U	**0.97 J**	**0.53 J**	**1.2 J**	<1.1 U	**0.81 J**	<1.9 U	**2.54 J**
DG	BRLTNDG-018-SW	BRLTNDG-918-SW	07/08/2019	FD	<1.0 U	<1.1 R	<1.1 U	<1.1 U	**1.1 J**	**0.71 J**	**1.4 J**	<1.1 U	**0.84 J**	**1.9 J**	**4.85 J**
DG	BRLTNDG-019-SW	BRLTNDG-019-SW	07/09/2019	N	**7.5**	<0.89 U	<0.89 U	<0.89 U	**6.0**	**3.6**	**49**	<0.89 U	**5.2**	<0.89 U	**57.8**
DG	BRLTNDG-020-SW	BRLTNDG-020-SW	07/09/2019	N	**12**	<0.97 U	<0.97 U	<0.97 U	**7.8**	**5.9**	**190**	<0.97 U	**18**	**29**	**242.9**
DG	BRLTNDG-021-SW	BRLTNDG-021-SW	07/09/2019	N	**16**	<0.93 U	<0.93 U	<0.93 U	**8.1**	**5.1**	**140**	**0.56 J**	**12**	**15**	**172.66 J**
DG	BRLTNDG-022-SW	BRLTNDG-022-SW	07/09/2019	N	**24**	<0.98 U	<0.98 U	<0.98 U	**18**	**7.8**	**160**	**1.1 J**	**21**	**81**	**270.9 J**
DG	BRLTNDG-023-SW	BRLTNDG-023-SW	07/08/2019	N	**49**	<1.0 U	<1.0 U	<1.0 U	**29**	**19**	**250**	**2.7**	**37**	**320**	**628.7**
UP	BRLTNUP-001-SW	BRLTNUP-001-SW	07/11/2019	N	**1.2 J**	<1.1 U	<1.1 U	<1.1 U	**2.1**	**2.3**	**7.2**	<1.1 U	**4.6**	<3.1 U	**14.1**
UP	BRLTNUP-002-SW	BRLTNUP-002-SW	07/08/2019	N	**0.99 J**	<1.1 U	<1.1 U	<1.1 U	**2.2**	**2.5**	**6.8**	**0.67 J**	**4.1**	**3.4**	**17.47 J**
UP	BRLTNUP-003-SW	BRLTNUP-003-SW	07/08/2019	N	**0.78 J**	<1.1 U	<1.1 U	<1.1 U	**2.6**	**1.8 J**	**2.1**	**0.93 J**	**4.8**	**2.9**	**12.53 J**
UP	BRLTNUP-004-SW	BRLTNUP-004-SW	07/11/2019	N	<0.97 U	<1.1 U	<1.1 U	<1.1 U	**1.2 J**	**0.54 J**	<1.8 U	<1.1 U	**0.83 J**	<2.1 U	**1.37 J**
UP	BRLTNUP-005-SW	BRLTNUP-005-SW	07/08/2019	N	**3.3**	<1.1 R	<1.1 UJ	<1.1 U	**4.0**	**3.4**	**15**	**0.73 J**	**4.9**	**5.3**	**29.33 J**

Detections are bolded.

Results equal to or exceeding the PAL are highlighted yellow.

J - Analyte detected, estimated concentration.

NA - No screening level available.

ng/L - nanograms per liter.

R - Rejected due to serious quality control deficiencies. Result is unusable.

UJ - Analyte not detected. LOD is approximate.

U - Analyte not detected. Result reported as < LOD (Limit of Detection).

[1] N - Normal field sample. FD - Field duplicate of sample above.

[2] USEPA RSL - USEPA Regional Screening Level, Tap Water, HQ=1.0, updated May 2018; available at https://semspub.epa.gov/work/HQ/197235.pdf.

[3] VT PAL - Vermont Groundwater Protection Rule; Chapter 12; Appendix 1, Groundwater Enforcement Standard. Adopted July 11, 2018; available at:

https://dec.vermont.gov/sites/dec/files/dwgwp/DW/Groundwater%20Protection%20Rule%20and%20Strategy.pdf.

Table 7
Summary of Sediment Analytical Results
Expanded Site Inspection Report for PFAS
Burlington ANGB, South Burlinton, Vermont

AOC	LOCID	Sample ID	Sample Date	Sample Type[1]	4:2FTS (ng/g)	6:2FTS (ng/g)	8:2FTS (ng/g)	NEtFOSAA (ng/g)	NMeFOSAA (ng/g)	PFBA (ng/g)	PFDA (ng/g)	PFDoA (ng/g)	PFDS (ng/g)
				PAL	NA	NA	NA	NA	NA	NA	NA	NA	NA
DG	BRLTNDG-001-SD	BRLTNDG-001-SD-0.0-0.5	06/13/2019	N	<1.0 U	<2.5 U	<2.5 U	<2.7 U	<2.7 U	<1.6 U	<0.91 U	<0.91 U	<2.7 U
DG	BRLTNDG-002-SD	BRLTNDG-002-SD-0.0-0.5	06/10/2019	N	<1.0 U	<2.6 U	<2.6 U	<2.8 U	<2.8 U	<1.7 U	<0.95 U	<0.95 U	<2.8 U
DG	BRLTNDG-003-SD	BRLTNDG-003-SD-0.0-0.5	06/13/2019	N	<1.4 U	<3.6 U	**2.7 J**	<3.8 U	<3.8 U	<2.3 U	<1.3 U	<1.3 U	<3.8 U
DG	BRLTNDG-004-SD	BRLTNDG-004-SD-0.0-0.5	06/13/2019	N	<1.4 U	<3.4 U	<3.4 U	<3.6 U	<3.6 U	<2.2 U	<1.2 U	<1.2 U	<3.6 U
DG	BRLTNDG-005-SD	BRLTNDG-005-SD-0.0-0.5	06/13/2019	N	<2.2 U	<5.6 U	<5.6 U	<5.9 U	<5.9 U	<3.5 U	<2.0 U	<2.0 U	<5.9 U
DG	BRLTNDG-006-SD	BRLTNDG-006-SD-0.0-0.5	06/13/2019	N	<1.4 U	**12**	**1.6 J**	<3.6 U	<3.6 U	<2.2 U	<1.2 U	<1.2 U	<3.6 U
DG	BRLTNDG-008-SD	BRLTNDG-008-SD-0.0-0.5	06/13/2019	N	<1.7 U	**2.1 J**	<4.3 U	<4.5 U	<4.5 U	<2.7 U	<1.5 U	<1.5 U	<4.5 U
DG	BRLTNDG-008-SD	BRLTNDG-908-SD-0.0-0.5	06/13/2019	FD	<1.3 U	**1.7 J**	<3.3 U	<3.4 U	<3.4 U	**1.1 J**	<1.2 U	<1.2 U	<3.4 U
DG	BRLTNDG-009-SD	BRLTNDG-009-SD-0.0-0.5	06/13/2019	N	<1.4 U	<3.5 U	<3.5 U	<3.7 U	<3.7 U	<2.2 U	<1.3 U	<1.3 U	<3.7 U
DG	BRLTNDG-010-SD	BRLTNDG-010-SD-0.0-0.5	06/13/2019	N	<0.95 U	<2.4 U	<2.4 U	<2.5 U	<2.5 U	<1.5 U	<0.86 U	<0.86 U	<2.5 U
DG	BRLTNDG-011-SD	BRLTNDG-011-SD-0.0-0.5	06/10/2019	N	<1.7 U	<4.4 U	<4.4 U	<4.6 U	<4.6 U	<2.8 U	<1.6 U	<1.6 U	<4.6 U
DG	BRLTNDG-012-SD	BRLTNDG-012-SD-0.0-0.5	06/10/2019	N	<1.5 U	<3.9 U	<3.9 U	<4.1 U	<4.1 U	<2.5 U	<1.4 U	<1.4 U	<4.1 U
DG	BRLTNDG-013-SD	BRLTNDG-013-SD-0.0-0.5	06/13/2019	N	<0.85 U	<2.2 U	<2.2 U	<2.3 U	<2.3 U	<1.4 U	<0.77 U	<0.77 U	<2.3 U
DG	BRLTNDG-014-SD	BRLTNDG-014-SD-0.0-0.5	06/10/2019	N	<1.1 U	<2.8 U	<2.8 U	<2.9 U	<2.9 U	<1.8 U	<1.0 U	<1.0 U	<2.9 U
DG	BRLTNDG-014-SD	BRLTNDG-914-SD-0.0-0.5	06/10/2019	FD	<1.0 U	<2.6 U	<2.6 U	<2.7 U	<2.7 U	<1.6 U	<0.93 U	<0.93 U	<2.7 U

AOC	LOCID	Sample ID	Sample Date	Sample Type[1]	PFHpA (ng/g)	PFHpS (ng/g)	PFHxA (ng/g)	PFHxS (ng/g)	PFNA (ng/g)	PFNS (ng/g)	PFOSA (ng/g)	PFPeA (ng/g)	PFPeS (ng/g)
				PAL	NA	NA	NA	NA	NA	NA	NA	NA	NA
DG	BRLTNDG-001-SD	BRLTNDG-001-SD-0.0-0.5	06/13/2019	N	<0.91 U	<0.87 U	<0.91 U	**0.34 J**	<0.91 U	<0.87 U	<0.91 U	<0.91 U	<0.86 U
DG	BRLTNDG-002-SD	BRLTNDG-002-SD-0.0-0.5	06/10/2019	N	<0.95 U	<0.91 U	<0.95 U	**1.2**	<0.95 U	<0.91 U	<0.95 U	<0.95 U	<0.89 U
DG	BRLTNDG-003-SD	BRLTNDG-003-SD-0.0-0.5	06/13/2019	N	<1.3 U	<1.2 U	<1.3 U	**1.4 J**	<1.3 U	<1.2 U	**11**	<1.3 U	<1.2 U
DG	BRLTNDG-004-SD	BRLTNDG-004-SD-0.0-0.5	06/13/2019	N	<1.2 U	<1.2 U	<1.2 U	**0.97 J**	<1.2 U	<1.2 U	**3.8**	<1.2 U	<1.2 U
DG	BRLTNDG-005-SD	BRLTNDG-005-SD-0.0-0.5	06/13/2019	N	**0.80 J**	**4.5**	**3.5**	**29**	<2.0 U	<1.9 U	<2.0 U	**1.7 J**	**3.0**
DG	BRLTNDG-006-SD	BRLTNDG-006-SD-0.0-0.5	06/13/2019	N	**0.54 J**	**1.6**	**1.4 J**	**5.8**	**0.86 J**	<1.2 U	<1.2 U	**1.3 J**	<1.2 U
DG	BRLTNDG-008-SD	BRLTNDG-008-SD-0.0-0.5	06/13/2019	N	**0.72 J**	**4.1**	**4.0**	**23**	<1.5 U	<1.5 U	**10**	**1.1 J**	**2.1**
DG	BRLTNDG-008-SD	BRLTNDG-908-SD-0.0-0.5	06/13/2019	FD	**0.68 J**	**3.1**	**3.6**	**21**	<1.2 U	<1.1 U	**9.7**	**1.3 J**	**1.7**
DG	BRLTNDG-009-SD	BRLTNDG-009-SD-0.0-0.5	06/13/2019	N	<1.3 U	<1.2 U	<1.3 U	<1.2 U	<1.3 U	<1.2 U	<1.3 U	<1.3 U	<1.2 U
DG	BRLTNDG-010-SD	BRLTNDG-010-SD-0.0-0.5	06/13/2019	N	<0.86 U	<0.83 U	<0.86 U	**0.80 J**	<0.86 U	<0.83 U	<0.86 U	<0.86 U	<0.81 U
DG	BRLTNDG-011-SD	BRLTNDG-011-SD-0.0-0.5	06/10/2019	N	<1.6 U	<1.5 U	<1.6 U	**1.5 J**	<1.6 U	<1.5 U	<1.6 U	<1.6 U	<1.5 U
DG	BRLTNDG-012-SD	BRLTNDG-012-SD-0.0-0.5	06/10/2019	N	<1.4 U	<1.3 U	<1.4 U	**1.5 J**	<1.4 U	<1.3 U	<1.4 U	<1.4 U	<1.3 U
DG	BRLTNDG-013-SD	BRLTNDG-013-SD-0.0-0.5	06/13/2019	N	<0.77 U	<0.74 U	<0.77 U	<0.73 U	<0.77 U	<0.74 U	<0.77 U	<0.77 U	<0.73 U
DG	BRLTNDG-014-SD	BRLTNDG-014-SD-0.0-0.5	06/10/2019	N	<1.0 U	<0.95 U	<1.0 U	<0.94 U	<1.0 U	<0.95 U	<1.0 U	<1.0 U	<0.94 U
DG	BRLTNDG-014-SD	BRLTNDG-914-SD-0.0-0.5	06/10/2019	FD	<0.93 U	<0.89 U	<0.93 U	<0.87 U	<0.93 U	<0.89 U	<0.93 U	<0.93 U	<0.87 U

Table 7
Summary of Sediment Analytical Results
Expanded Site Inspection Report for PFAS
Burlington ANGB, South Burlinton, Vermont

AOC	LOCID	Sample ID	Sample Date	Sample Type[1]	PFTeA (ng/g)	PFTriA (ng/g)	PFUnA (ng/g)	PFBS (ng/g)	PFOA (ng/g)	PFOS (ng/g)
				PAL	NA	NA	NA	[2]	300[3]	1,260[2]
DG	BRLTNDG-001-SD	BRLTNDG-001-SD-0.0-0.5	06/13/2019	N	<0.91 U	<0.91 U	<0.91 U	<0.80 U	<0.91 U	<0.87 U
DG	BRLTNDG-002-SD	BRLTNDG-002-SD-0.0-0.5	06/10/2019	N	<0.95 U	<0.95 U	<0.95 U	<0.84 U	<0.95 U	**9.3**
DG	BRLTNDG-003-SD	BRLTNDG-003-SD-0.0-0.5	06/13/2019	N	<1.3 U	<1.3 U	<1.3 U	<1.2 U	**0.41 J**	**30**
DG	BRLTNDG-004-SD	BRLTNDG-004-SD-0.0-0.5	06/13/2019	N	<1.2 U	<1.2 U	<1.2 U	<1.1 U	**0.41 J**	**17**
DG	BRLTNDG-005-SD	BRLTNDG-005-SD-0.0-0.5	06/13/2019	N	<2.0 U	<2.0 U	<2.0 U	**1.9 J**	**4.1**	**190**
DG	BRLTNDG-006-SD	BRLTNDG-006-SD-0.0-0.5	06/13/2019	N	<1.2 U	<1.2 U	<1.2 U	<1.1 U	**3.7**	**130**
DG	BRLTNDG-008-SD	BRLTNDG-008-SD-0.0-0.5	06/13/2019	N	<1.5 U	<1.5 U	<1.5 U	**1.4 J**	**4.3**	**320**
DG	BRLTNDG-008-SD	BRLTNDG-908-SD-0.0-0.5	06/13/2019	FD	<1.2 U	<1.2 U	<1.2 U	**1.2 J**	**4.1**	**260**
DG	BRLTNDG-009-SD	BRLTNDG-009-SD-0.0-0.5	06/13/2019	N	<1.3 U	<1.3 U	<1.3 U	<1.1 U	<1.3 U	**2.4**
DG	BRLTNDG-010-SD	BRLTNDG-010-SD-0.0-0.5	06/13/2019	N	<0.86 U	<0.86 U	<0.86 U	<0.76 U	<0.86 U	**1.8 J**
DG	BRLTNDG-011-SD	BRLTNDG-011-SD-0.0-0.5	06/10/2019	N	<1.6 U	<1.6 U	<1.6 U	<1.4 U	<1.6 U	**14**
DG	BRLTNDG-012-SD	BRLTNDG-012-SD-0.0-0.5	06/10/2019	N	<1.4 U	<1.4 U	<1.4 U	<1.2 U	<1.4 U	**5.9**
DG	BRLTNDG-013-SD	BRLTNDG-013-SD-0.0-0.5	06/13/2019	N	<0.77 U	<0.77 U	<0.77 U	<0.68 U	<0.77 U	**2.2**
DG	BRLTNDG-014-SD	BRLTNDG-014-SD-0.0-0.5	06/10/2019	N	<1.0 U	<1.0 U	<1.0 U	<0.88 U	<1.0 U	**0.69 J**
DG	BRLTNDG-014-SD	BRLTNDG-914-SD-0.0-0.5	06/10/2019	FD	<0.93 U	<0.93 U	<0.93 U	<0.82 U	<0.93 U	**0.72 J**

Notes:

[1] N - Normal field sample. FD - Field duplicate of sample above.

[2] USEPA RSL Calc - USEPA Regional Screening Level Calculator, Residential Soil, HQ=1.0; available at: https://epa-prgs.ornl.gov/cgi-bin/chemicals/csl_search.

[3] VDH SL - Vermont Department of Health Screening Level.

Detections are bolded.

J - Analyte detected, estimated concentration.

NA - No screening level available.

ng/g - nanograms per gram.

U - Analyte not detected. Result reported as < LOD (Limit of Detection).

Table 8
Summary of Stormwater Analytical Results
Expanded Site Inspection Report for PFAS
Burlington ANGB, South Burlington, Vermont

AOC	LOCID	Sample ID	Sample Date	Sample Type[1]	4:2FTS (ng/L)	6:2FTS (ng/L)	8:2FTS (ng/L)	NEtFOSAA (ng/L)	NMeFOSAA (ng/L)	PFBA (ng/L)	PFDA (ng/L)	PFDoA (ng/L)	PFDS (ng/L)
				PAL	NA	NA	NA	NA	NA	NA	NA	NA	NA
DG	BRLTNDG-001-ST	BRLTNDG-001-ST	06/11/2019	N	<1.8 R	**8.7 R**	<1.8 U	<2.2 U	<2.2 U	**11**	**0.68 J**	<1.1 U	<2.1 U
DG	BRLTNDG-003-ST	BRLTNDG-003-ST	07/17/2019	N	<0.90 R	**4.7**	<1.8 U	<0.90 U	<1.1 U	**6.2**	<0.90 U	<0.90 U	<0.90 U
DG	BRLTNDG-004-ST	BRLTNDG-004-ST	07/17/2019	N	<0.90 R	<3.6 R	<1.8 U	<0.90 U	<1.1 U	**3.8 J**	<0.90 U	<0.90 U	<0.90 U
DG	BRLTNDG-006-ST	BRLTNDG-006-ST	07/17/2019	N	<0.98 R	<3.9 R	<2.0 U	<0.98 U	<1.2 U	**3.1 J**	<0.98 U	<0.98 U	<0.98 U
DG	BRLTNDG-007-ST	BRLTNDG-007-ST	06/11/2019	N	<1.9 R	**2.1 R**	<1.9 U	<2.3 U	<2.3 U	**4.7 J**	<1.1 U	<1.1 U	<2.2 U
DG	BRLTNDG-011-ST	BRLTNDG-011-ST	06/11/2019	N	<1.9 R	<1.9 R	<1.9 U	<2.3 U	<2.3 U	**6.0**	<1.1 U	<1.1 UJ	<2.2 U
DG	BRLTNDG-011-ST	BRLTNDG-911-ST	06/11/2019	FD	<1.8 R	<1.8 R	<1.8 U	<2.1 U	<2.1 U	**5.7**	<1.1 U	<1.1 U	<2.0 U
DG	BRLTNDG-012-ST	BRLTNDG-012-ST	06/11/2019	N	<1.8 R	**170 R**	**2.1 J**	<2.1 U	<2.1 U	**9.3**	<1.1 U	<1.1 U	<2.0 U
DG	BRLTNDG-014-ST	BRLTNDG-014-ST	06/11/2019	N	<1.7 R	**150**	**21**	<2.0 U	<2.0 U	**41**	**0.95 J**	<1.0 U	<1.9 U
DG	BRLTNDG-014-ST	BRLTNDG-914-ST	06/11/2019	FD	<1.7 U	**120**	**29**	<2.1 UJ	<2.1 U	**42**	**1.3 J**	<1.0 UJ	<2.0 U
DG	BRLTNDG-016-ST	BRLTNDG-016-ST	06/11/2019	N	<1.7 R	<1.7 R	<1.7 U	<2.1 U	<2.1 U	**9.1**	<1.0 U	<1.0 U	<2.0 U

AOC	LOCID	Sample ID	Sample Date	Sample Type[1]	PFHpS (ng/L)	PFHxA (ng/L)	PFNS (ng/L)	PFOSA (ng/L)	PFPeA (ng/L)	PFPeS (ng/L)	PFTeA (ng/L)	PFTriA (ng/L)	PFUnA (ng/L)
				PAL	NA	NA	NA	NA	NA	NA	NA	NA	NA
DG	BRLTNDG-001-ST	BRLTNDG-001-ST	06/11/2019	N	**1.5 J**	**9.8**	<2.1 U	<2.6 U	**4.3 J**	**2.7**	<1.1 UJ	<1.1 U	<1.1 U
DG	BRLTNDG-003-ST	BRLTNDG-003-ST	07/17/2019	N	<0.90 U	**2.5**	<0.90 U	<0.90 UJ	**2.1**	<0.90 U	<0.90 R	<0.90 U	<0.90 U
DG	BRLTNDG-004-ST	BRLTNDG-004-ST	07/17/2019	N	<0.90 U	**0.51 J**	<0.90 U	<0.90 UJ	<0.90 U	<0.90 U	<0.90 U	<0.90 U	<0.90 U
DG	BRLTNDG-006-ST	BRLTNDG-006-ST	07/17/2019	N	<0.98 U	**0.58 J**	<0.98 U	<0.98 UJ	<0.98 U	<0.98 U	<0.98 U	<0.98 U	<0.98 U
DG	BRLTNDG-007-ST	BRLTNDG-007-ST	06/11/2019	N	<1.0 U	**1.1 J**	<2.2 U	<2.8 UJ	<4.6 U	<1.0 U	<1.1 R	<1.1 U	<1.1 U
DG	BRLTNDG-011-ST	BRLTNDG-011-ST	06/11/2019	N	<1.0 U	**0.63 J**	<2.2 U	<2.7 U	<4.5 U	<1.0 U	<1.1 R	<1.1 UJ	<1.1 U
DG	BRLTNDG-011-ST	BRLTNDG-911-ST	06/11/2019	FD	<0.96 U	**0.70 J**	<2.0 U	<2.5 UJ	<4.2 U	<0.96 U	<1.1 U	<1.1 U	<1.1 U
DG	BRLTNDG-012-ST	BRLTNDG-012-ST	06/11/2019	N	**2.8**	**30**	<2.0 U	**2.6 J**	**9.0**	**8.7**	<1.1 U	<1.1 U	<1.1 U
DG	BRLTNDG-014-ST	BRLTNDG-014-ST	06/11/2019	N	**33**	**82**	**1.7 J**	**8.2**	**47**	**52**	<1.0 R	<1.0 U	**0.45 J**
DG	BRLTNDG-014-ST	BRLTNDG-914-ST	06/11/2019	FD	**34**	**81**	**1.6 J**	**11 J**	**47**	**52**	<1.0 R	<1.0 UJ	**0.68 J**
DG	BRLTNDG-016-ST	BRLTNDG-016-ST	06/11/2019	N	<0.96 U	**8.2**	<2.0 U	<2.5 U	**24**	<0.96 U	<1.0 UJ	<1.0 U	<1.0 U

Table 8
Summary of Stormwater Analytical Results
Expanded Site Inspection Report for PFAS
Burlington ANGB, South Burlington, Vermont

AOC	LOCID	Sample ID	Sample Date	Sample Type[1]	PFBS (ng/L)	PFHpA (ng/L)	PFHxS (ng/L)	PFNA (ng/L)	PFOA (ng/L)	PFOS (ng/L)	SUM of PFHpA + PFHxS + PFNA + PFOA + PFOS (ng/L)
				PAL	400,000[2]	20[3]	20[3]	20[3]	20[3]	20[3]	20[3]
DG	BRLTNDG-001-ST	BRLTNDG-001-ST	06/11/2019	N	**2.4**	**1.9**	**20**	**0.76 J**	**3.9**	**76**	**102.56 J**
DG	BRLTNDG-003-ST	BRLTNDG-003-ST	07/17/2019	N	**1.1 J**	**0.76 J**	**3.4**	<0.90 U	**1.3 J**	**29**	**34.46 J**
DG	BRLTNDG-004-ST	BRLTNDG-004-ST	07/17/2019	N	<0.90 U	<0.90 U	<0.90 U	<0.90 U	<0.90 U	**1.1 J**	**1.1 J**
DG	BRLTNDG-006-ST	BRLTNDG-006-ST	07/17/2019	N	<0.98 U	<0.98 U	<0.98 U	<0.98 U	<0.98 U	<0.98 U	ND
DG	BRLTNDG-007-ST	BRLTNDG-007-ST	06/11/2019	N	**0.49 J**	**0.44 J**	**0.92 J**	**0.39 J**	**0.52 J**	**3.4**	**5.67 J**
DG	BRLTNDG-011-ST	BRLTNDG-011-ST	06/11/2019	N	<1.0 U	**1.2 J**	<1.0 U	<1.1 U	<1.1 U	**0.66 J**	**1.86 J**
DG	BRLTNDG-011-ST	BRLTNDG-911-ST	06/11/2019	FD	<0.96 U	**1.3 J**	<0.96 U	<1.1 U	<1.1 U	**0.74 J**	**2.04 J**
DG	BRLTNDG-012-ST	BRLTNDG-012-ST	06/11/2019	N	**7.0**	**3.4**	**41**	**0.41 J**	**7.0**	**200**	**251.81 J**
DG	BRLTNDG-014-ST	BRLTNDG-014-ST	06/11/2019	N	**28**	**18**	**400**	**8.5**	**69**	**1,600**	**2,095.5**
DG	BRLTNDG-014-ST	BRLTNDG-914-ST	06/11/2019	FD	**29**	**20**	**360**	**10**	**80**	**1,700**	**2,170**
DG	BRLTNDG-016-ST	BRLTNDG-016-ST	06/11/2019	N	**1.6 J**	**1.7 J**	**1.9**	**0.44 J**	**0.80 J**	**8.1**	**12.94 J**

Notes:

[1] N - Normal field sample. FD - Field duplicate of sample above.

[2] USEPA RSL - USEPA Regional Screening Level, Tap Water, HQ=1.0, updated May 2018; available at https://semspub.epa.gov/work/HQ/197235.pdf.

[3] VT PAL - Vermont Groundwater Protection Rule; Chapter 12; Appendix 1, Groundwater Enforcement Standard. Adopted July 11, 2018; available at: https://dec.vermont.gov/sites/dec/files/dwgwp/DW/Groundwater%20Protection%20Rule%20and%20Strategy.pdf.

Detections are bolded.

Results equal to or exceeding the PAL are highlighted yellow.

J - Analyte detected, estimated concentration.

NA - No screening level available.

ND - There were no detections in the PFAS Summation.

ng/L - nanograms per liter.

R - Rejected due to serious quality control deficiencies. Result is unusable.

U - Analyte not detected. Result reported as < LOD (Limit of Detection).

UJ - Analyte not detected. LOD is approximate.

Table 9
Summary of Slug Test Analyses
Expanded Site Inspection Report for PFAS
Burlington ANGB, South Burlington, Vermont

					Test 1		Test 2		Test 3		Test 4		Test 5			
Well	Screened Lithology	Slug Length (feet) (1.25" diameter slug)	Partially or Fully Penetrating Screen Interval	Analysis Method	Test Type	Hydraulic Conductivity (cm/s)	Test Type	Hydraulic Conductivity (cm/s)	Test Type	Hydraulic Conductivity (cm/s)	Test Type	Hydraulic Conductivity (cm/s)	Test Type	Hydraulic Conductivity (cm/s)	Average Hydraulic Conductivity (cm/s)	Average Hydraulic Conductivity (ft/day)
AASF06-MW03S	CL, GP, SW, Bedrock	2	Partially	Bouwer & Rice	Rising	8.58E-05	Rising	8.79E-05	-	-	-	-	-	-	8.69E-05	0.25
BRLTN02-MW01D	ML	7	Fully	Bouwer & Rice	Falling	3.66E-04	Rising	2.24E-04	Rising	2.68E-04	Rising	2.65E-04	-	-	2.81E-04	0.80
BRLTN02-MW01S	SP, ML	7	Fully	Bouwer & Rice	Falling	9.33E-04	Falling	9.61E-04	Rising	7.33E-04	Rising	5.77E-04	-	-	8.01E-04	2.27
BRLTN03-MW01D	CH, CL	5	Fully	Bouwer & Rice	Falling	4.43E-05	Falling	3.65E-05	Rising	3.20E-05	Rising	4.48E-05	-	-	3.94E-05	0.11
BRLTN03-MW01S	SP, SW, MH	2	Partially	Bouwer & Rice	Rising	5.40E-04	Rising	4.20E-04	Rising	3.79E-04	-	-	-	-	4.46E-04	1.27
BRLTN04-MW01S	SP	2	Fully	Bouwer & Rice	Falling	5.10E-04	Falling	5.20E-04	Rising	5.10E-04	Rising	5.17E-04	-	-	5.14E-04	1.46
BRLTNDG-MW01D	SP	7	Fully	Hvorslev	Falling	2.22E-03	Falling	2.23E-03	Rising	2.33E-03	Rising	2.30E-03	Rising	2.08E-03	2.27E-03	6.43
BRLTNDG-MW03S	CL	2	Fully	Bouwer & Rice	Falling	6.74E-05	Falling	2.94E-05	Rising	1.71E-05	Rising	2.36E-05	-	-	3.44E-05	0.10
BRLTNDG-MW04S	CL	5	Fully	Bouwer & Rice	Falling	1.12E-04	Falling	2.29E-05	Rising	5.11E-05	Rising	4.39E-05	-	-	5.75E-05	0.16

Notes:

CH - Inorganic clays of high plasticity, fat clays
CL - Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
cm/s - centimeters per second
ft/day - feet per day
GP - Poorly graded gravels or gravel-sand mixtures, little or no fines
MH - Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
ML - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity
SP - Poorly graded sands or gravelly sands, little or no fines
SW - Well-graded sands or gravelly sands, little or no fines

Hvorslev Estimating Hydraulic Conductivity of an Aquifer (1951)
Bouwer-Rice Estimating Hydraulic Conductivity of an Aquifer (1976)
Aquifer Test Pro (ATP) version 2015.1, Waterloo Hydrogeologic

Table 10
Summary of Nearby Private Water Wells
Expanded Site Inspection Report for PFAS
Burlington ANGB, South Burlington, Vermont

Well Number	Well Type	Well Depth (feet)	Casing Length (feet)	Depth to Bedrock (feet)	Well Yield (gpm)	Screened Interval	Year Completed
6	Domestic	158	111	100	4	Open hole	1968
58	Domestic - This well has been abandoned*	374	94	92	25	Open hole	1983
59	Agricultural	128	102	93	40	Open hole	1983
93	Domestic	143	69	64	7	Open hole	1975
202	Domestic	468	33	27	30	Open hole	1980
223	Domestic	243	68	61	6	Open hole	1981

Notes:

Well data from available (post-1965) Vermont Department of Conservation water well completion reports.

Listed wells are within an approximate 1-mile radius of the center of the Base.

gpm - gallons per minute

* Well No. 58 was abandoned (The Johnson Company, 2018).

Table 11
Summary of Project Action Level Exceedances
Expanded Site Inspection Report for PFAS
Burlington ANGB, South Burlington, Vermont

AOC	AOC Name	Project Action Level Exceedance				
		Soil	Ground-water	Surface Water	Sediment	Storm-water
1	Former FTA 1 (IRP Site 1)	No	**Yes**	**Yes**	No	**Yes**
2	Building 90 Former Fire Station	No	**Yes**	**Yes**	No	**Yes**
3	Building 60 Current Fire Station	No	**Yes**	**Yes**	No	**Yes**
4	Fire Department Equipment Testing Area	No	**Yes**	--	--	--
5	F-16 Emergency Response Site	No	**Yes**	--	--	--
6	Cessna Crash Response Site	--	**Yes**	--	--	--
Downgradient	Not applicable	--	**Yes**	**Yes**	No	**Yes**
Upgradient	Not applicable	--	**Yes**	**Yes**	No	--

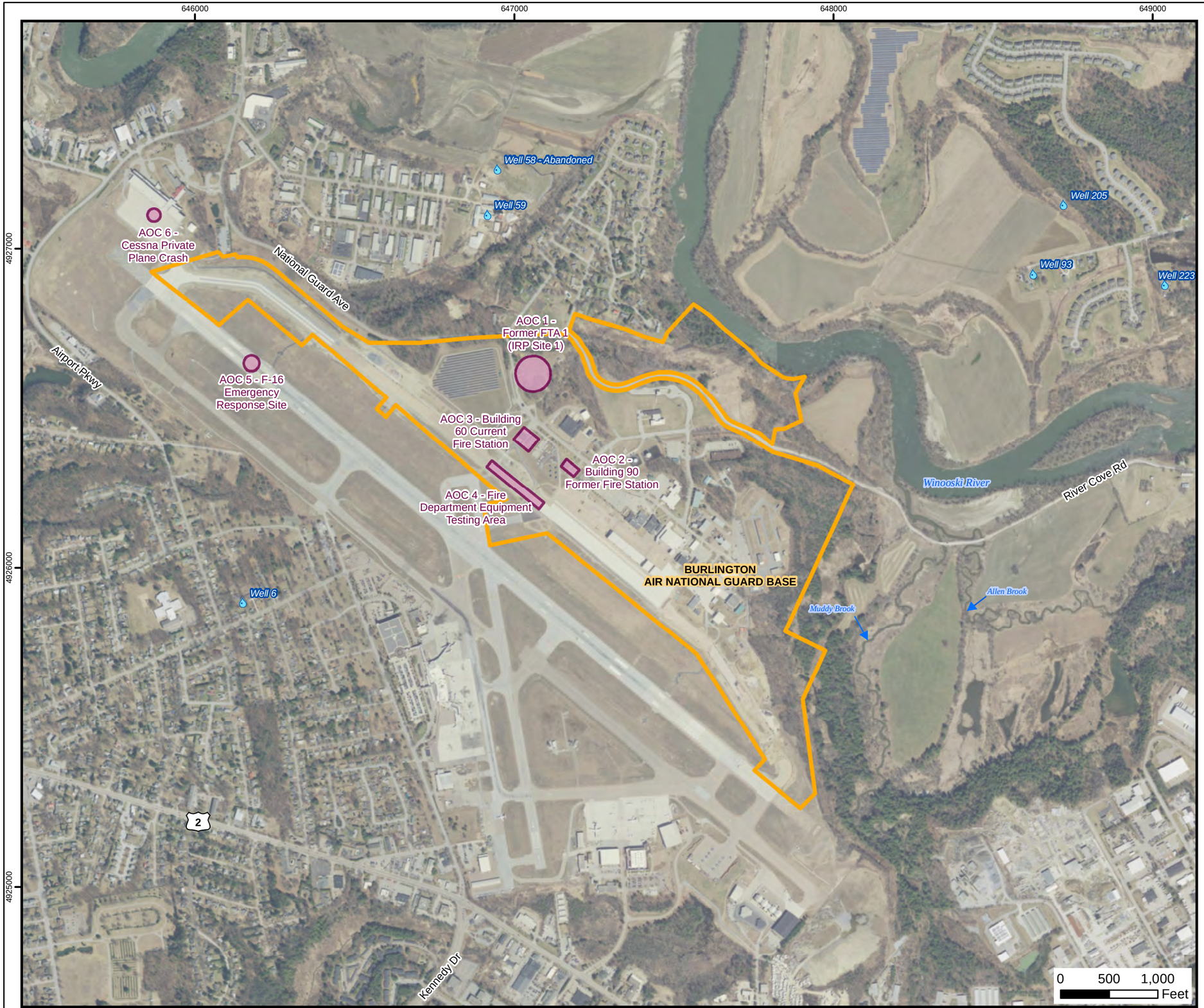
Notes:

Conclusions based on results from Site Inspection (Aerostar SES, 2018) and Expanded Site Inspection.

"-" indicates that samples were not collected in that area.

FIGURES

Figure 1
Site Location
Burlington Air National Guard Base



Legend

- Agricultural / Domestic Well
- Area of Concern (AOC)
- Installation Boundary



DATA SOURCES
-Image: ESRI, 2018
-ANG Base: Installation Boundary, AOC Boundary

PARSONS	NATIONAL GUARD BUREAU OPERATIONS DIVISION RESTORATION BRANCH (NGB/A4VR)
DESIGNED BY: RGS	Expanded Site Inspections for Perfluorinated Compounds at Multiple Air National Guard Installations
DRAWN BY: RGS	
CHECKED BY: TM	SCALE: AS SHOWN; CONTRACT NUMBER: GS00Q140A DU127
SUBMITTED BY: TM	DATE: 12/16/2019; DELIVERY ORDER NUMBER: W9133L-18-F-0052
	Coordinate System: WGS 1984 UTM Zone 18N

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4926000

AOC 6 - Cessna Private Plane Crash
BRLTNDG-012-SD
BRLTNDG-011-SD
BRLTNDG-010-SD
BRLTNDG-013-SD
BRLTNDG-009-SD
BRLTNDG-002-SD
BRLTNDG-005-SD
BRLTNDG-008-SD
BRLTNDG-004-SD
BRLTNDG-006-SD
BRLTNDG-003-SD
BRLTN05-002-SO
BRLTN05-003-SO
AOC 5 - F-16 Emergency Response Site
BRLTN05-001-SO
BRLTN01-003-SD
BRLTN01-002-SO
BRLTN01-004-SO
BRLTN01-003-SO
BRLTN01-001-SO
AOC 1 - Former FTA 1 (IRP Site 1)
BRLTNDG-014-SD
BRLTNDG-001-SD
BRLTN03-003-SD
BRLTN03-002-SO
BRLTN03-001-SO
BRLTN02-004-SD
AOC 3 - Building 60 Current Fire Station
AOC 2 - Building 90 Former Fire Station
BRLTN02-002-SO
BRLTN02-003-SO
BRLTN02-001-SO
BRLTN04-002-SO
BRLTN04-003-SO
BRLTN04-001-SO
BRLTN04-004-SO
AOC 4 - Fire Department Equipment Testing Area
BURLINGTON AIR NATIONAL GUARD BASE

0 300 600 Feet

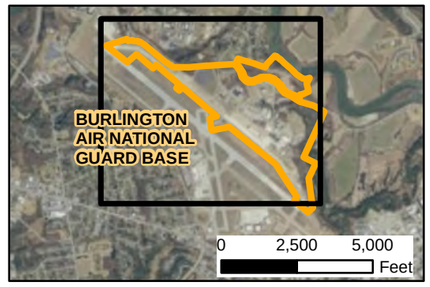
Figure 2
Soil and Sediment Sample Location Overview
Burlington Air National Guard Base

Legend

- Sediment Sample
- Soil Sample
- Area of Concern (AOC)
- Installation Boundary

-Italicized labels are from the Aerostar SES LLC, 2018 SI Report.
-Bold labels are from current ESI fieldwork.

ESI = Expanded Site Inspection
SI = Site Inspection



DATA SOURCES
-Image: ESRI, 2018
-ANG Base: Installation Boundary, AOC Boundary
-Parsons: Sample locations and results
-SI Report (Aerostar SES LLC, 2018): SI Samples

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DRAWN BY: RGS	
CHECKED BY: TM	SCALE: AS SHOWN; CONTRACT NUMBER: GS00QI40A DU127
SUBMITTED BY: TM	DATE: 11/5/2019; DELIVERY ORDER NUMBER: W9133L-18-F-0052
	Coordinate System: WGS 1984 UTM Zone 18N

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Figure 3
Groundwater
Sample Location Overview
Burlington Air National Guard Base

646000
647000
4927000
4926000

AASF06-MW02S
AASF06-MW03S
AOC 6 - Cessna Private Plane Crash
AASF06-MW01S
Well 59
BRLTNDG-MW05S
BRLTNDG-MW05D
BRLTNDG-MW04S
BRLTNDG-MW04D
BRLTNDG-MW01S
BRLTNDG-MW01D
BRLTNDG-MW03S
BRLTNDG-MW03D
BRLTNDG-MW02S
V1-MW-107
MW-105
BRLTN01-V1MW14L
V1-MW-106
V1-MW14
V1-MW12
BRLTN01-MW103
V1-RFW2
V1-BR-08
BRLTN01-MW102
BRLTN05-002-GW
BTV-MW-9
V1-MW1
BRLTN01-TRENCHSUMP
V4-BR03
V4-MW414
AOC 5 - F-16 Emergency Response Site
BRLTN01-MW-V1BP2
BRLTN01-MW-BP3
MW-101
V4-MW413
BRLTN01-002-GW
BRLTN01-001-GW
V4-MW-5
BRLTN05-001-GW
BTV-MW-14
AOC 1 - Former FTA 1 (IRP Site 1)
MW-401
MW-403
BRLTN03-002-GW
BRLTN03-001-GW
BRLTN03-MW01S
BRLTN03-MW01D
MW-405
AOC 3 - Building 60 Current Fire Station
BRLTN02-MW01S
BRLTN02-MW01D
BRLTN02-002-GW
BRLTN02-001-GW
BRLTN02-003-GW
AOC 2 - Building 90 Former Fire Station
BRLTN04-002-GW
BRLTN04-003-GW
BRLTN04-MW01S
BRLTN04-MW01D
BRLTN04-001-GW
BRLTN04-004-GW
AOC 4 - Fire Department Equipment Testing Area
BRLTNUP-MW01D
BTV-MW-5
BURLINGTON AIR NATIONAL GUARD BASE

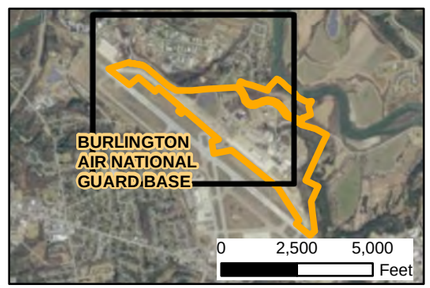
0 275 550 Feet

Legend

- Groundwater Monitoring Well
- Temporary Monitoring Well
- Groundwater Collection Trench Sump
- Agricultural Well
- Area of Concern (AOC)
- Installation Boundary

-*Italicized labels are from the Aerostar SES LLC, 2018 SI Report.*
-**Bold labels are from current ESI fieldwork.**

ESI = Expanded Site Inspection
SI = Site Inspection



DATA SOURCES
-Image: ESRI, 2018
-ANG Base: Installation Boundary, AOC Boundary
-Parsons: Sample locations and results
-SI Report (Aerostar SES LLC, 2018): SI Samples

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DESIGNED BY: RGS DRAWN BY: RGS CHECKED BY: TM SUBMITTED BY: TM	Expanded Site Inspections for Perfluorinated Compounds at Multiple Air National Guard Installations SCALE: AS SHOWN CONTRACT NUMBER: GS00Q140A DU127 DATE: 12/2/2019 DELIVERY ORDER NUMBER: W9133L-18-F-0052 Coordinate System: WGS 1984 UTM Zone 18N

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Figure 4
Surface Water and Stormwater Sample Location Overview
Burlington Air National Guard Base

646000 647000 648000

4928000 4927000 4926000

Winooski River

BRLTNDG-018-SW
BRLTNDG-017-SW
BRLTNDG-016-SW
BRLTNDG-023-SW
BRLTNDG-020-SW
BRLTNDG-022-SW
BRLTNDG-016-ST
BRLTNDG-011-SW
BRLTNDG-012-SW
BRLTNDG-021-SW
BRLTNDG-010-SW
BRLTNDG-013-SW
BRLTNDG-014-ST
BRLTNDG-019-SW
BRLTNDG-009-SW
BRLTNDG-004-SW
BRLTNDG-005-SW
BRLTNDG-002-SW
BRLTNDG-008-SW
BRLTN01-003
BRLTNDG-006-SW
BRLTNDG-015-SW
BRLTNDG-003-SW
BRLTNDG-007-ST
BRLTNDG-014-SW
BRLTNDG-006-ST
BRLTNDG-011-ST
BRLTNDG-004-ST
BRLTN03-003
BRLTNDG-012-ST
BRLTNDG-001-SW
BRLTNDG-003-ST
BRLTNDG-001-ST
BRLTN02-004
BRLTNUP-005-SW
Winooski River
BRLTNUP-004-SW
BRLTNUP-002-SW
BRLTNUP-003-SW
BRLTNUP-001-SW
Allen Brook
Muddy Brook

AOC 6 - Cessna Private Plane Crash
AOC 5 - F-16 Emergency Response Site
AOC 1 - Former FTA 1 (IRP Site 1)
AOC 3 - Building 60 Current Fire Station
AOC 4 - Fire Department Equipment Testing Area
AOC 2 - Building 90 Former Fire Station

BURLINGTON AIR NATIONAL GUARD BASE

0 500 1,000 Feet

Legend

- Stormwater Sample
- Surface Water Sample
- Area of Concern (AOC)
- Installation Boundary

-*Italicized labels are from the Aerostar SES LLC, 2018 SI Report.*
-**Bold labels are from current ESI fieldwork.**

ESI = Expanded Site Inspection
SI = Site Inspection

DATA SOURCES
-Image: ESRI, 2018
-ANG Base: Installation Boundary, AOC Boundary
-Parsons: Sample locations and results
-SI Report (Aerostar SES LLC, 2018): SI Samples

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	Coordinate System: WGS 1984 UTM Zone 18N

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646000
647000
4927000
4926000

AASF06-MW02S
273.15
AASF06-MW03S
259.98
AASF06-MW01S
283.75
BRLTNDG-MW01S
230.37
BRLTNDG-MW04S
217.98
BRLTNDG-MW05S
232.12
BRLTNDG-MW02S
274.08
BRLTNDG-MW03S
292.16
MW-105
248.85
V1-MW-107
258.5
V1-MW-106
249.07
V1-RFW2
298.2
V1-MW14
267.61
V1-MW12
296.92
BTV-MW-9
275.23
V1-MW1
302.61
MW-101
264.97
V4-MW413
240.62
V4-MW-5
247.61
MW-401
256.97
MW-403
259.6
BTV-MW-14
305.61
BRLTN03-MW01S
308.53
MW-405
267.36
BRLTN02-MW01S
303.64
BRLTN04-MW01S
312.03
BTV-MW-5
316.77
280
270
260
250
240
220
230
290
300
310

BURLINGTON
AIR NATIONAL GUARD BASE

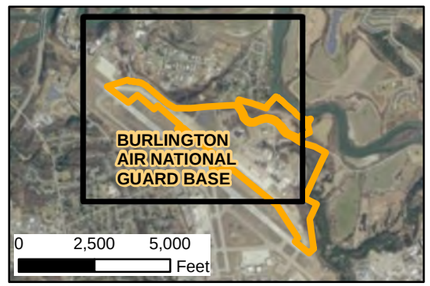
0 300 600
Feet

Figure 5
Shallow Groundwater Elevation Contours
Burlington Air National Guard Base

Legend

- Shallow Groundwater Well with Groundwater Elevation in feet AMSL
- Groundwater Elevation Contour - 10 foot interval
- Inferred Shallow Groundwater Flow Direction
- Area of Concern (AOC)
- Installation Boundary

-AMSL = Above Mean Sea Level
-Groundwater elevations measured by Parsons on July 13, 2019, except for AASF06-MW01S and AASF06-MW02S which were measured on July 15, 2019.



DATA SOURCES
-Image: ESRI, 2018
-ANG Base: Installation Boundary, AOC Boundary
-Parsons: Sample locations and results

PARSONS	NATIONAL GUARD BUREAU OPERATIONS DIVISION RESTORATION BRANCH (NGB/A4VR)
DESIGNED BY: RGS DRAWN BY: RGS CHECKED BY: TM SUBMITTED BY: TM	Expanded Site Inspections for Perfluorinated Compounds at Multiple Air National Guard Installations
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Coordinate System: WGS 1984 UTM Zone 18N	

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646200
646400
646600
4927000
4926800

Pipe deformed, vertically, 15%

Joint, offset (displaced)

Outfall NG003-O

Joint, offset (displaced)

Catch Basin S6.007

Pipe deformed, vertically, 25%

Outfall NG002-N

BURLINGTON
AIR NATIONAL GUARD BASE

Flowing water

Catch Basin S6.009

Flowing water

Outfall NG001-P

National Guard Ave

Flowing water

Catch Basin S6.017

Catch Basin S6.018

Infiltration gallery

Infiltration gallery

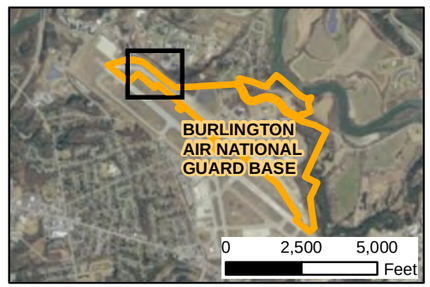
AOC 5 - F-16
Emergency
Response Site

0 75 150
Feet

Figure 6
Storm Sewer
Scoping Overview
Burlington Air National Guard Base

Legend

- Storm Sewer Survey Photography (Select Photos Shown)
- Storm Sewer Survey Section
- Underground Stormwater System
- Area of Concern (AOC)
- Installation Boundary

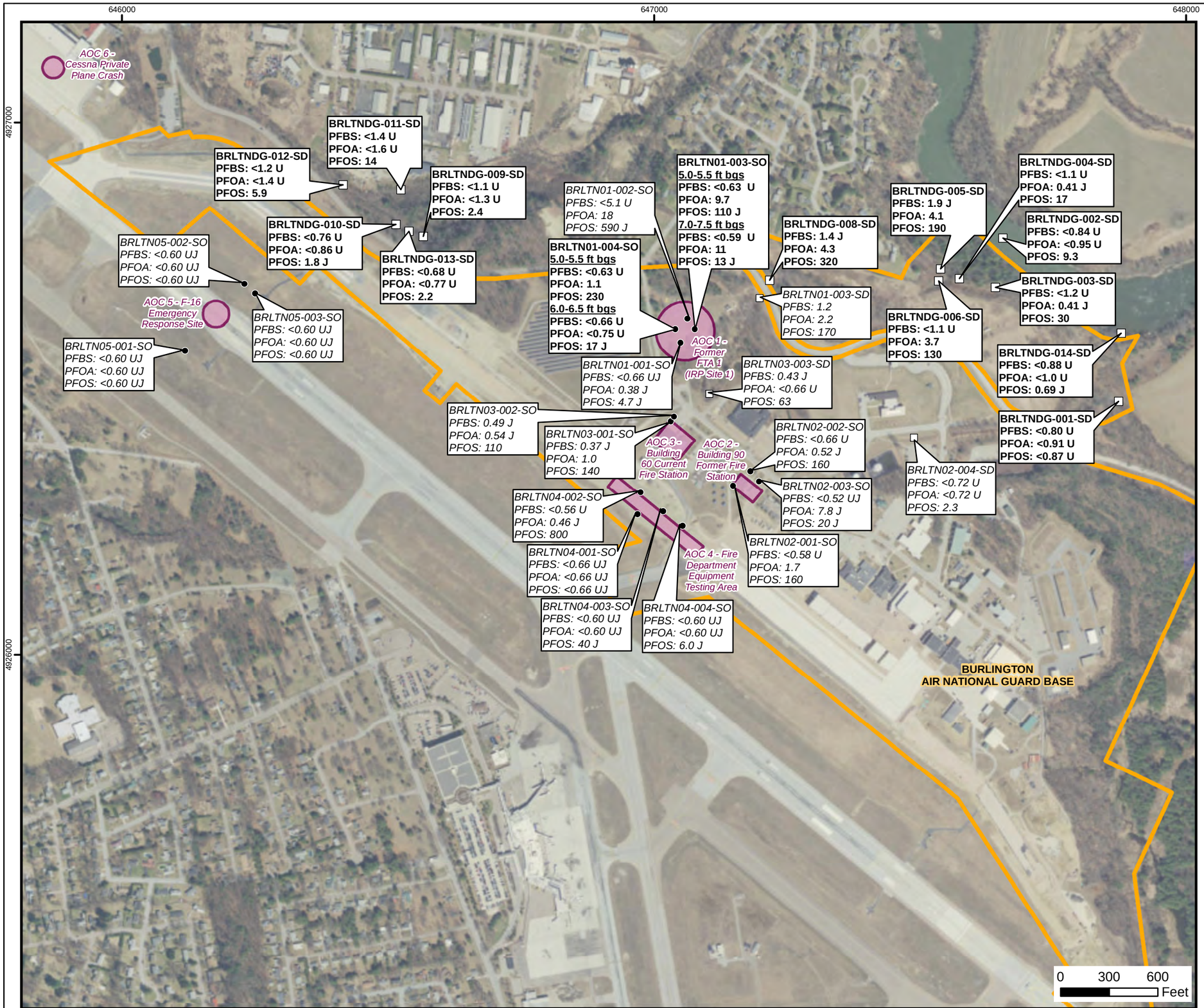


DATA SOURCES
-Image: ESRI, 2018
-ANG Base: Installation Boundary, AOC Boundary, Underground Stormwater System

PARSONS	NATIONAL GUARD BUREAU OPERATIONS DIVISION RESTORATION BRANCH (NGB/A4VR)
DESIGNED BY: RGS	Expanded Site Inspections for Perfluorinated Compounds at Multiple Air National Guard Installations
DRAWN BY: RGS	
CHECKED BY: TM	SCALE: AS SHOWN; CONTRACT NUMBER: GS00QI40A DU127
SUBMITTED BY: TM	DATE: 2/13/2020; DELIVERY ORDER NUMBER: W9133L-18-F-0052
	Coordinate System: WGS 1984 UTM Zone 18N

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Figure 7
Soil and Sediment Analytical Results
Burlington Air National Guard Base



Legend

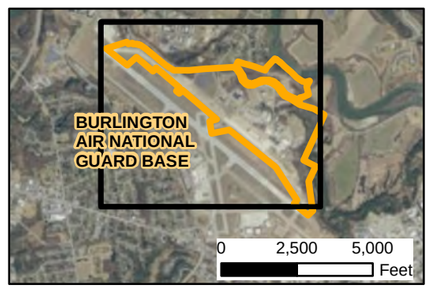
Samples (Red value if exceedance):

- ☐ Sediment Sample
- • Soil Sample
- Area of Concern (AOC)
- Installation Boundary

-Italicized labels are from the Aerostar SES LLC, 2018 SI Report.
-Bold labels are from current ESI fieldwork.

-Values shown as ng/g.
-PFBS Project Action Limit = 1,260,000 ng/g
-PFOA Project Action Limit = 300 ng/g
-PFOS Project Action Limit = 1,260 ng/g

ESI = Expanded Site Inspection
SI = Site Inspection
U = Analyte not detected. Result report as < Limit of Detection.
J = Analyte detected, estimated concentration
ng/g = nanograms per gram
PFBS = perfluorobutanesulfonic acid
PFOA = perfluorooctanoic acid
PFOS = perfluorooctane sulfonate
ft bgs = feet below ground surface



DATA SOURCES
-Image: ESRI, 2018
-ANG Base: Installation Boundary, AOC Boundary, Existing Wells (some locations modified)
-Parsons: ESI samples and results
-SI Report (Aerostar SES LLC, 2018): SI Samples/Results

PARSONS	NATIONAL GUARD BUREAU OPERATIONS DIVISION RESTORATION BRANCH (NGB/A4VR)
DESIGNED BY: RGS	Expanded Site Inspections for Perfluorinated Compounds at Multiple Air National Guard Installations
DRAWN BY: RGS	
CHECKED BY: TM	SCALE: AS SHOWN; CONTRACT NUMBER: GS00QI40A DU127
SUBMITTED BY: TM	DATE: 11/5/2019; DELIVERY ORDER NUMBER: W9133L-18-F-0052
	Coordinate System: WGS 1984 UTM Zone 18N

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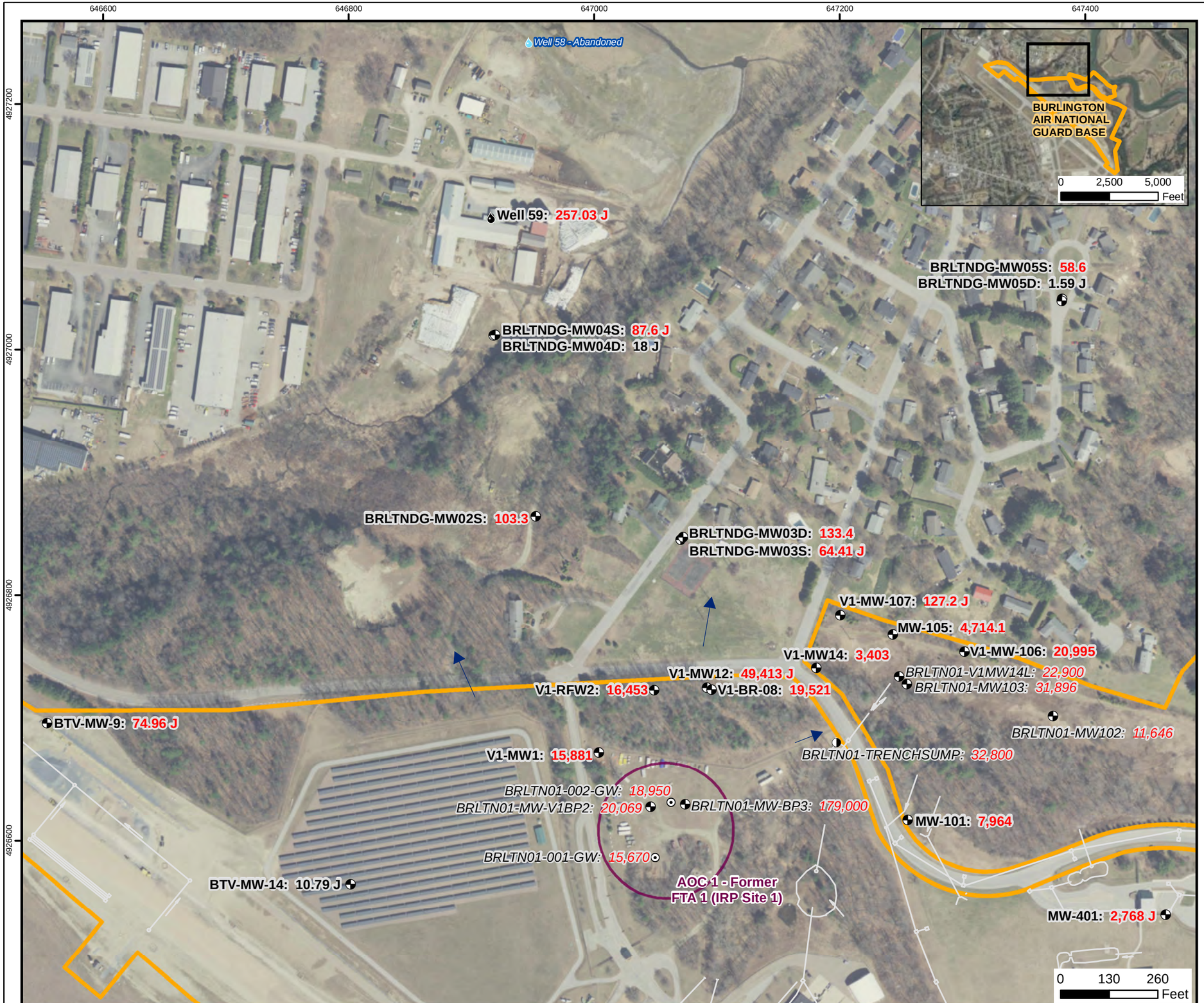


Figure 8

AOC 1 - Former FTA 1 (IRP Site 1)
Groundwater Analytical Results
Burlington Air National Guard Base

Legend

Samples (Red value if exceedance):

- Groundwater Monitoring Well
- Temporary Monitoring Well
- Groundwater Collection Trench Sump
- Agricultural Well
- Underground Stormwater System
- Inferred Shallow Groundwater Flow Direction
- Area of Concern (AOC)
- Installation Boundary

-Italicized labels are from the Aerostar SES LLC, 2018 SI Report.
-Bold labels are from current ESI fieldwork.

-Value shown is the Sum of PFHpA+PFHxS+PFNA+PFOA+PFOS (ng/L)
-Project Action Limit = 20 ng/L
-All ESI analytical results shown on this figure are from the second sampling round of the ESI.

ESI = Expanded Site Inspection
J = Analyte detected, estimated concentration
ng/L = nanograms per liter
PFHpA = perfluoroheptanoic acid
PFHxS = perfluorohexane sulfonic acid
PFNA = perfluorononanoic acid
PFOA = perfluorooctanoic acid
PFOS = perfluorooctane sulfonate
SI = Site Inspection

DATA SOURCES
-Image: ESRI, 2018
-ANG Base: Installation Boundary, AOC Boundary, Existing Wells (some locations modified), Underground Stormwater System
-Burlington International Airport: Existing BTV Wells
-Parsons: ESI samples and results
-SI Report (Aerostar SES LLC, 2018): SI Samples/Results, Groundwater Flow Direction

PARSONS	NATIONAL GUARD BUREAU OPERATIONS DIVISION RESTORATION BRANCH (NGB/A4VR)
DESIGNED BY: RGS DRAWN BY: RGS CHECKED BY: TM SUBMITTED BY: TM	Expanded Site Inspections for Perfluorinated Compounds at Multiple Air National Guard Installations
SCALE: AS SHOWN	CONTRACT NUMBER: GS00QI40A DU127
DATE: 12/16/2019	DELIVERY ORDER NUMBER: W9133L-18-F-0052
Coordinate System: WGS 1984 UTM Zone 18N	

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Figure 9

AOC 2 - Building 90 Former Fire Station
Groundwater Analytical Results
Burlington Air National Guard Base

Legend

Samples (Red value if exceedance):

- Groundwater Monitoring Well
- Temporary Monitoring Well
- Groundwater Collection Trench Sump
- Underground Stormwater System
- Inferred Shallow Groundwater Flow Direction
- Area of Concern (AOC)
- Installation Boundary

-Italicized labels are from the Aerostar SES LLC, 2018 SI Report.
-Bold labels are from current ESI fieldwork.

-Value shown is the Sum of PFHpA+PFHxS+PFNA+PFOA+PFOS (ng/L)
-Project Action Limit = 20 ng/L
-All ESI analytical results shown on this figure are from the second sampling round of the ESI.

ESI = Expanded Site Inspection
J = Analyte detected, estimated concentration
ng/L = nanograms per liter
PFHpA = perfluoroheptanoic acid
PFHxS = perfluorohexane sulfonic acid
PFNA = perfluorononanoic acid
PFOA = perfluorooctanoic acid
PFOS = perfluorooctane sulfonate
SI = Site Inspection

DATA SOURCES
-Image: ESRI, 2018
-ANG Base: Installation Boundary, AOC Boundary, Existing Wells (some locations modified), Underground Stormwater System
-Burlington International Airport: Existing BTV Wells
-Parsons: ESI samples and results
-SI Report (Aerostar SES LLC, 2018): SI Samples/Results, Groundwater Flow Direction

PARSONS	NATIONAL GUARD BUREAU OPERATIONS DIVISION RESTORATION BRANCH (NGB/A4VR)
DESIGNED BY: RGS	Expanded Site Inspections for Perfluorinated Compounds at Multiple Air National Guard Installations
DRAWN BY: RGS	
CHECKED BY: TM	SCALE: AS SHOWN — CONTRACT NUMBER: GS00Q140A DU127
SUBMITTED BY: TM	DATE: 12/16/2019 — DELIVERY ORDER NUMBER: W9133L-18-F-0052
	Coordinate System: WGS 1984 UTM Zone 18N

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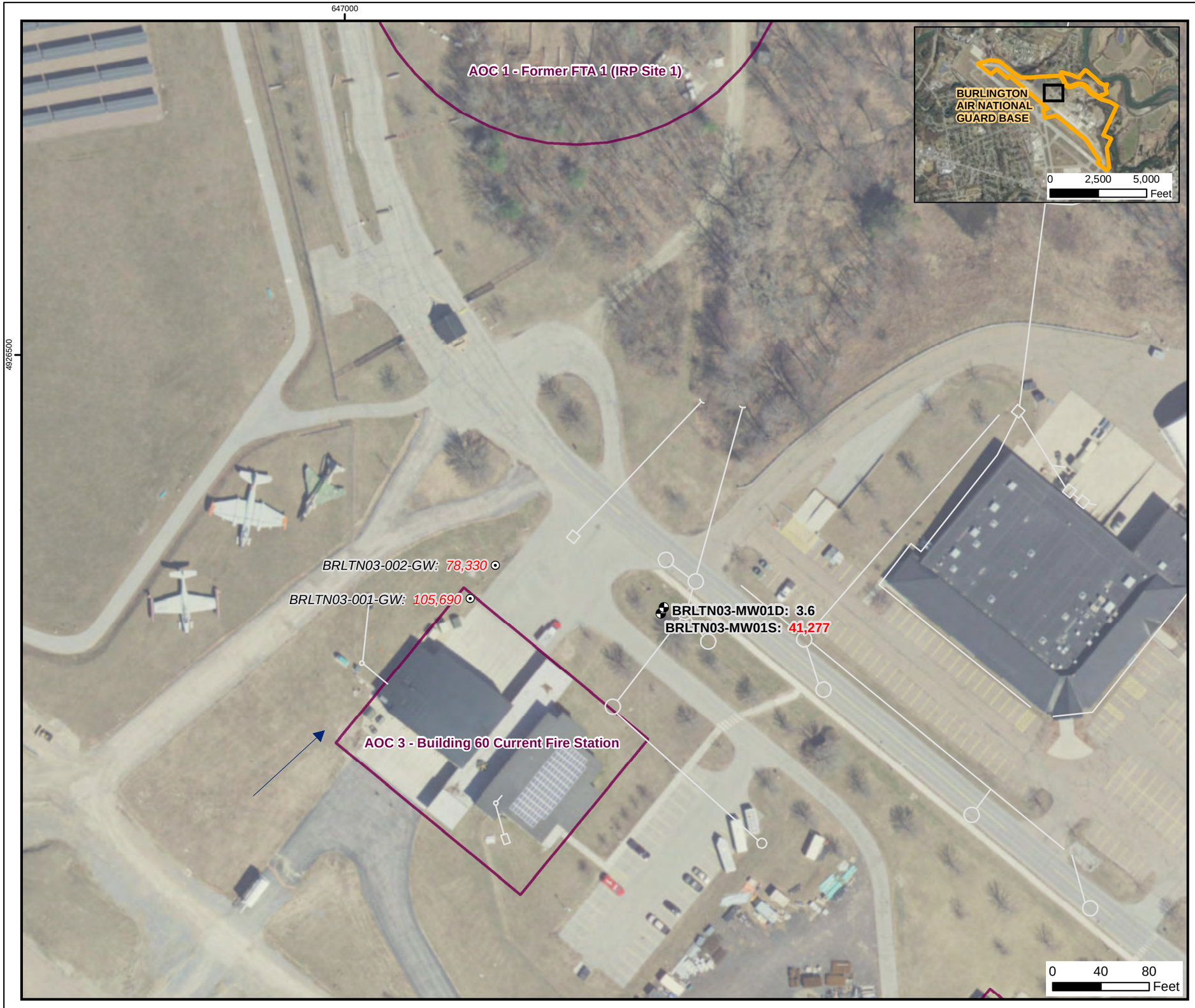


Figure 10

AOC 3 - Building 60 Current Fire Station Groundwater Analytical Results Burlington Air National Guard Base

Legend

Samples (Red value if exceedance):

- Groundwater Monitoring Well
- Temporary Monitoring Well
- Groundwater Collection Trench Sump
- Underground Stormwater System
- Inferred Shallow Groundwater Flow Direction
- Area of Concern (AOC)
- Installation Boundary

-Italicized labels are from the Aerostar SES LLC, 2018 SI Report.

-Bold labels are from current ESI fieldwork.

-Value shown is the Sum of PFHpA+PFHxS+PFNA+PFOA+PFOS (ng/L)
-Project Action Limit = 20 ng/L
-All ESI analytical results shown on this figure are from the second sampling round of the ESI.

ESI = Expanded Site Inspection
J = Analyte detected, estimated concentration
ng/L = nanograms per liter
PFHpA = perfluoroheptanoic acid
PFHxS = perfluorohexane sulfonic acid
PFNA = perfluorononanoic acid
PFOA = perfluorooctanoic acid
PFOS = perfluorooctane sulfonate
SI = Site Inspection

DATA SOURCES
-Image: ESRI, 2018
-ANG Base: Installation Boundary, AOC Boundary, Existing Wells (some locations modified), Underground Stormwater System
-Burlington International Airport: Existing BTV Wells
-Parsons: ESI samples and results
-SI Report (Aerostar SES LLC, 2018): SI Samples/Results, Groundwater Flow Direction

PARSONS	NATIONAL GUARD BUREAU OPERATIONS DIVISION RESTORATION BRANCH (NGB/A4VR)
DESIGNED BY: RGS	Expanded Site Inspections for Perfluorinated Compounds at Multiple Air National Guard Installations
DRAWN BY: RGS	
CHECKED BY: TM	SCALE: AS SHOWN; CONTRACT NUMBER: GS00Q140A DU127
SUBMITTED BY: TM	DATE: 12/16/2019; DELIVERY ORDER NUMBER: W9133L-18-F-0052
	Coordinate System: WGS 1984 UTM Zone 18N

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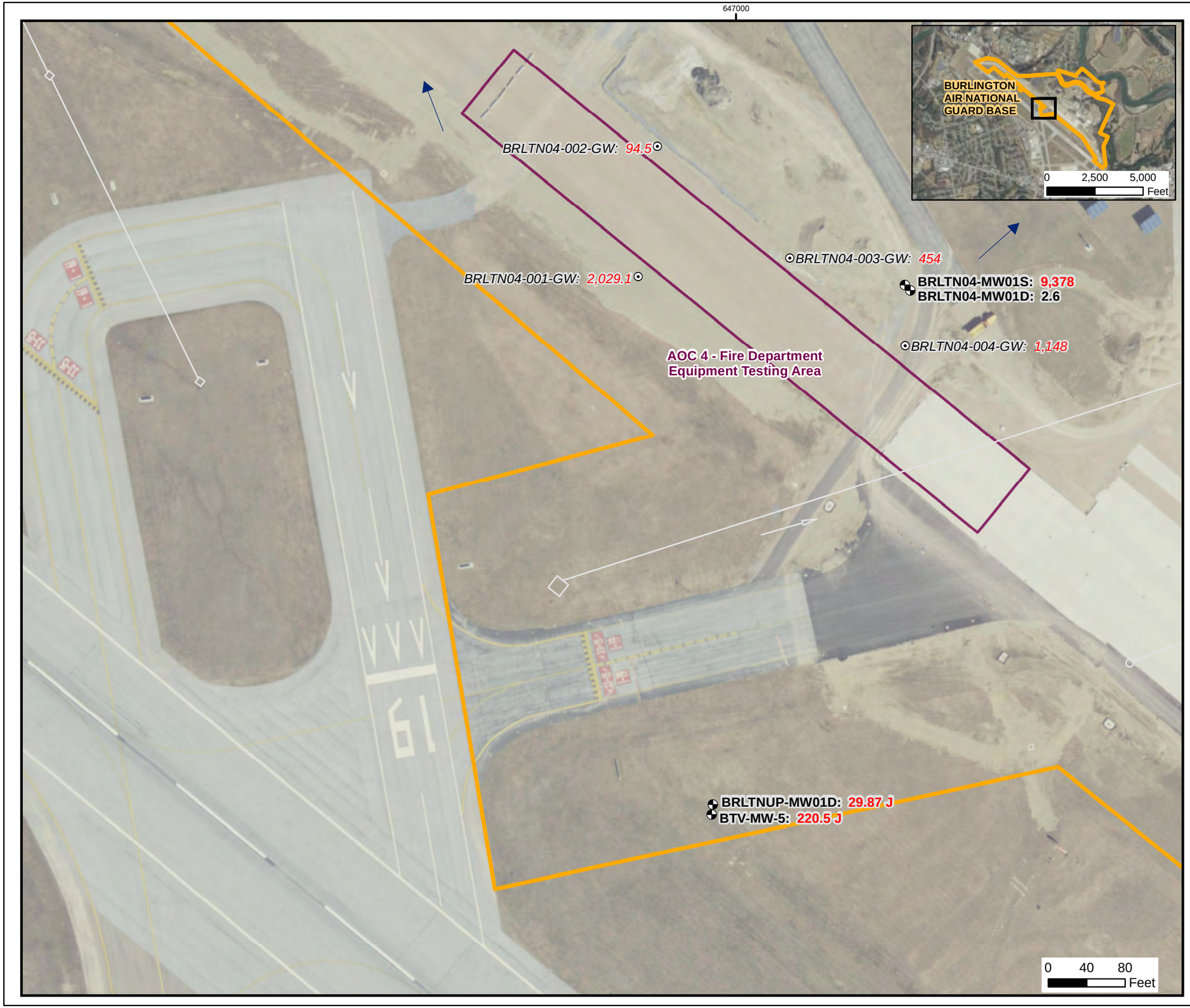


Figure 11

AOC 4 - Fire Department Equipment Testing Area
Groundwater Analytical Results
Burlington Air National Guard Base

Legend

Samples (Red value if exceedance):

- Groundwater Monitoring Well
- Temporary Monitoring Well
- Groundwater Collection Trench Sump
- Underground Stormwater System
- Inferred Shallow Groundwater Flow Direction
- Area of Concern (AOC)
- Installation Boundary

-Italicized labels are from the Aerostar SES LLC, 2018 SI Report.
-Bold labels are from current ESI fieldwork.

-Value shown is the Sum of PFHpA+PFHxS+PFNA+PFOA+PFOS (ng/L)
-Project Action Limit = 20 ng/L
-All ESI analytical results shown on this figure are from the second sampling round of the ESI.

ESI = Expanded Site Inspection
J = Analyte detected, estimated concentration
ng/L = nanograms per liter
PFHpA = perfluoroheptanoic acid
PFHxS = perfluorohexane sulfonic acid
PFNA = perfluorononanoic acid
PFOA = perfluorooctanoic acid
PFOS = perfluorooctane sulfonate
SI = Site Inspection

DATA SOURCES
-Image: ESRI, 2018
-ANG Base: Installation Boundary, AOC Boundary, Existing Wells (some locations modified), Underground Stormwater System
-Burlington International Airport: Existing BTV Wells
-Parsons: ESI samples and results
-SI Report (Aerostar SES LLC, 2018): SI Samples/Results, Groundwater Flow Direction

PARSONS	NATIONAL GUARD BUREAU OPERATIONS DIVISION RESTORATION BRANCH (NGB/A4VR)
DESIGNED BY: RGS	Expanded Site Inspections for Perfluorinated Compounds at Multiple Air National Guard Installations
DRAWN BY: RGS	
CHECKED BY: TM	SCALE: AS SHOWN; CONTRACT NUMBER: GS00QI40A DU127
SUBMITTED BY: TM	DATE: 12/16/2019; DELIVERY ORDER NUMBER: W9133L-18-F-0052
	Coordinate System: WGS 1984 UTM Zone 18N

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Figure 12

AOC 5 - F-16 Emergency Response Site Groundwater Analytical Results Burlington Air National Guard Base

Legend

Samples (Red value if exceedance):

- Groundwater Monitoring Well
- Temporary Monitoring Well
- Groundwater Collection Trench Sump
- Underground Stormwater System
- Inferred Shallow Groundwater Flow Direction
- Area of Concern (AOC)
- Installation Boundary

-Italicized labels are from the Aerostar SES LLC, 2018 SI Report.
-Bold labels are from current ESI fieldwork.

-Value shown is the Sum of PFHpA+PFHxS+PFNA+PFOA+PFOS (ng/L)
-Project Action Limit = 20 ng/L
-All ESI analytical results shown on this figure are from the second sampling round of the ESI.

ESI = Expanded Site Inspection
J = Analyte detected, estimated concentration
ng/L = nanograms per liter
PFHpA = perfluoroheptanoic acid
PFHxS = perfluorohexane sulfonic acid
PFNA = perfluorononanoic acid
PFOA = perfluorooctanoic acid
PFOS = perfluorooctane sulfonate
SI = Site Inspection

DATA SOURCES
-Image: ESRI, 2018
-ANG Base: Installation Boundary, AOC Boundary, Existing Wells (some locations modified), Underground Stormwater System
-Burlington International Airport: Existing BTV Wells
-Parsons: ESI samples and results
-SI Report (Aerostar SES LLC, 2018): SI Samples/Results, Groundwater Flow Direction

PARSONS	NATIONAL GUARD BUREAU OPERATIONS DIVISION RESTORATION BRANCH (NGB/A4VR)
DESIGNED BY: RGS	Expanded Site Inspections for Perfluorinated Compounds at Multiple Air National Guard Installations
DRAWN BY: RGS	
CHECKED BY: TM	SCALE: AS SHOWN; CONTRACT NUMBER: GS00QI40A DU127
SUBMITTED BY: TM	DATE: 12/16/2019; DELIVERY ORDER NUMBER: W9133L-18-F-0052
	Coordinate System: WGS 1984 UTM Zone 18N

PATH: F:\GISCADD\projects\OASIS\GIS\Burlington\Maps\ESI\BURLINGTON_ESI_AOC5.mxd

645600
645800
646000
646200
4927200
4927000
4926800

AASF06-MW02S: 12.9 J

AASF06-MW03S: 154.1

AOC 6 -
Cessna Private
Plane Crash

AASF06-MW01S: 20 J

BRLTNDG-MW01S: 197.1
BRLTNDG-MW01D: 31.5

BURLINGTON
AIR NATIONAL
GUARD BASE

0 2,500 5,000
Feet

0 100 200
Feet

Figure 13
AOC 6 - Cessna Private Plane Crash
Groundwater Analytical Results
Burlington Air National Guard Base

Legend

Samples (Red value if exceedance):

- Groundwater Monitoring Well
- Temporary Monitoring Well
- Groundwater Collection Trench Sump
- Underground Stormwater System
- Inferred Shallow Groundwater Flow Direction
- Area of Concern (AOC)
- Installation Boundary

-Italicized labels are from the Aerostar SES LLC, 2018 SI Report.
-Bold labels are from current ESI fieldwork.

-Value shown is the Sum of PFHpA+PFHxS+PFNA+PFOA+PFOS (ng/L)
-Project Action Limit = 20 ng/L
-All ESI analytical results shown on this figure are from the second sampling round of the ESI.

ESI = Expanded Site Inspection
J = Analyte detected, estimated concentration
ng/L = nanograms per liter
PFHpA = perfluoroheptanoic acid
PFHxS = perfluorohexane sulfonic acid
PFNA = perfluorononanoic acid
PFOA = perfluorooctanoic acid
PFOS = perfluorooctane sulfonate
SI = Site Inspection

DATA SOURCES
-Image: ESRI, 2018
-ANG Base: Installation Boundary, AOC Boundary, Existing Wells (some locations modified), Underground Stormwater System
-Burlington International Airport: Existing BTV Wells
-Parsons: ESI samples and results
-SI Report (Aerostar SES LLC, 2018): SI Samples/Results, Groundwater Flow Direction

PARSONS	NATIONAL GUARD BUREAU OPERATIONS DIVISION RESTORATION BRANCH (NGB/A4VR)
DESIGNED BY: RGS	Expanded Site Inspections for Perfluorinated Compounds at Multiple Air National Guard Installations
DRAWN BY: RGS	
CHECKED BY: TM	SCALE: AS SHOWN CONTRACT NUMBER: GS00QI40A DU127
SUBMITTED BY: TM	DATE: 12/16/2019 DELIVERY ORDER NUMBER: W9133L-18-F-0052
	Coordinate System: WGS 1984 UTM Zone 18N

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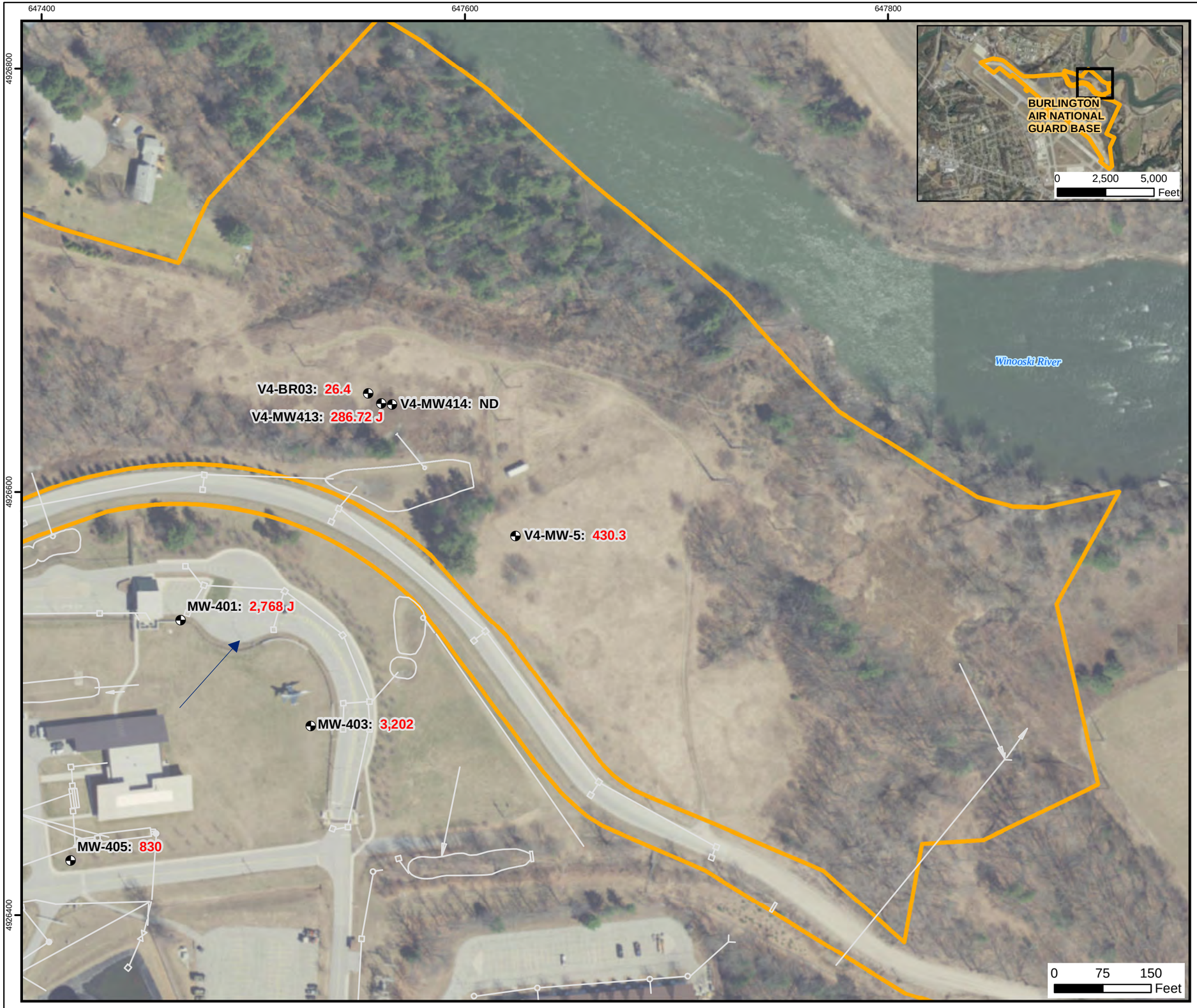


Figure 14
Eastern Downgradient Groundwater Analytical Results Burlington Air National Guard Base

Legend

Samples (Red value if exceedance):

- Groundwater Monitoring Well
- Temporary Monitoring Well
- Groundwater Collection Trench Sump
- Underground Stormwater System
- Inferred Shallow Groundwater Flow Direction
- Area of Concern (AOC)
- Installation Boundary

-Italicized labels are from the Aerostar SES LLC, 2018 SI Report.
-Bold labels are from current ESI fieldwork.

-Value shown is the Sum of PFHpA+PFHxS+PFNA+PFOA+PFOS (ng/L)
-Project Action Limit = 20 ng/L
-All ESI analytical results shown on this figure are from the second sampling round of the ESI.

ESI = Expanded Site Inspection
J = Analyte detected, estimated concentration
ng/L = nanograms per liter
PFHpA = perfluoroheptanoic acid
PFHxS = perfluorohexane sulfonic acid
PFNA = perfluorononanoic acid
PFOA = perfluorooctanoic acid
PFOS = perfluorooctane sulfonate
SI = Site Inspection

DATA SOURCES
-Image: ESRI, 2018
-ANG Base: Installation Boundary, AOC Boundary, Existing Wells (some locations modified), Underground Stormwater System
-Burlington International Airport: Existing BTV Wells
-Parsons: ESI samples and results
-SI Report (Aerostar SES LLC, 2018): SI Samples/Results, Groundwater Flow Direction

PARSONS	NATIONAL GUARD BUREAU OPERATIONS DIVISION RESTORATION BRANCH (NGB/A4VR)
DESIGNED BY: RGS	Expanded Site Inspections for Perfluorinated Compounds at Multiple Air National Guard Installations
DRAWN BY: RGS	
CHECKED BY: TM	SCALE: AS SHOWN; CONTRACT NUMBER: GS00QI40A DU127
SUBMITTED BY: TM	DATE: 12/16/2019; DELIVERY ORDER NUMBER: W9133L-18-F-0052
	Coordinate System: WGS 1984 UTM Zone 18N

PATH: F:\GISCADD\projects\OASIS\GIS\Burlington\Maps\ESI\BURLINGTON_ESI_Eastern_Downgradient.mxd

Figure 15
Surface Water and Stormwater Analytical Results Burlington Air National Guard Base

646000 647000 648000
4928000 4927000 4926000

Winooski River

BRLTNDG-018-SW: 2.54 J
BRLTNDG-017-SW: 3.54 J
BRLTNDG-016-SW: 8.31 J
BRLTNDG-023-SW: 628.7
BRLTNDG-011-SW: 737.3 J
BRLTNDG-019-SW: 57.8
BRLTNDG-016-ST: 12.94 J
BRLTNDG-020-SW: 242.9
BRLTNDG-012-SW: 654.8
BRLTNDG-022-SW: 270.9 J
BRLTNDG-021-SW: 172.66 J
BRLTNDG-010-SW: 1,853.3
BRLTNDG-009-SW: 366.7 J
BRLTNDG-013-SW: 2,324
BRLTNDG-014-ST: 2,095.5
BRLTNDG-008-SW: 13,406 J
BRLTN01-003: 49,897 J
BRLTNDG-006-SW: 10,619
BRLTNDG-004-SW: 1,085
BRLTNDG-005-SW: 8,138 J
BRLTNDG-002-SW: 549.4 J
BRLTNDG-015-SW: 1.28 J
BRLTNDG-003-SW: 430.6 J
BRLTNDG-007-ST: 5.67 J
BRLTNDG-014-SW: 301.1 J
BRLTNDG-006-ST: ND
BRLTNDG-011-ST: 1.86 J
BRLTN03-003: 14,086 J
BRLTNDG-012-ST: 251.81 J
BRLTNDG-004-ST: 1.1 J
BRLTNDG-001-SW: 242.1 J
BRLTN02-004: 108
BRLTNDG-003-ST: 34.46 J
BRLTNDG-001-ST: 102.56 J
BRLTNUP-005-SW: 29.33 J
BRLTNUP-004-SW: 1.37 J
BRLTNUP-002-SW: 17.47 J
BRLTNUP-003-SW: 12.53 J
BRLTNUP-001-SW: 14.1

AOC 6 - Cessna Private Plane Crash
AOC 5 - F-16 Emergency Response Site
AOC 1 - Former FTA1 (IRP Site 1)
AOC 3 - Building 60 Current Fire Station
AOC 4 - Fire Department Equipment Testing Area
AOC 2 - Building 90 Former Fire Station

BURLINGTON AIR NATIONAL GUARD BASE

Winooski River
Allen Brook
Muddy Brook

0 500 1,000 Feet

Legend

Samples (Red value if exceedance):

- Stormwater Sample
- Surface Water Sample
- Area of Concern (AOC)
- Installation Boundary

-Italicized labels are from the Aerostar SES LLC, 2018 SI Report.
-Bold labels are from current ESI fieldwork.

-Value shown is the Sum of PFHpA+PFHxS+PFNA+PFOA+PFOS (ng/L)
-Project Action Limit = 20 ng/L

ESI = Expanded Site Inspection
J = Analyte detected, estimated concentration
ng/L = nanograms per liter
PFHpA = perfluoroheptanoic acid
PFHxS = perfluorohexane sulfonic acid
PFNA = perfluorononanoic acid
PFOA = perfluorooctanoic acid
PFOS = perfluorooctane sulfonate
SI = Site Inspection

DATA SOURCES
-Image: ESRI, 2018
-ANG Base: Installation Boundary, AOC Boundary, Existing Wells (some locations modified)
-Parsons: ESI samples and results
-SI Report (Aerostar SES LLC, 2018): SI Samples/Results

PARSONS	NATIONAL GUARD BUREAU OPERATIONS DIVISION RESTORATION BRANCH (NGB/A4VR)
DESIGNED BY: RGS	Expanded Site Inspections for Perfluorinated Compounds at Multiple Air National Guard Installations
DRAWN BY: RGS	
CHECKED BY: TM	SCALE: AS SHOWN; CONTRACT NUMBER: GS00QI40A DU127
SUBMITTED BY: TM	DATE: 12/2/2019; DELIVERY ORDER NUMBER: W9133L-18-F-0052
	Coordinate System: WGS 1984 UTM Zone 18N

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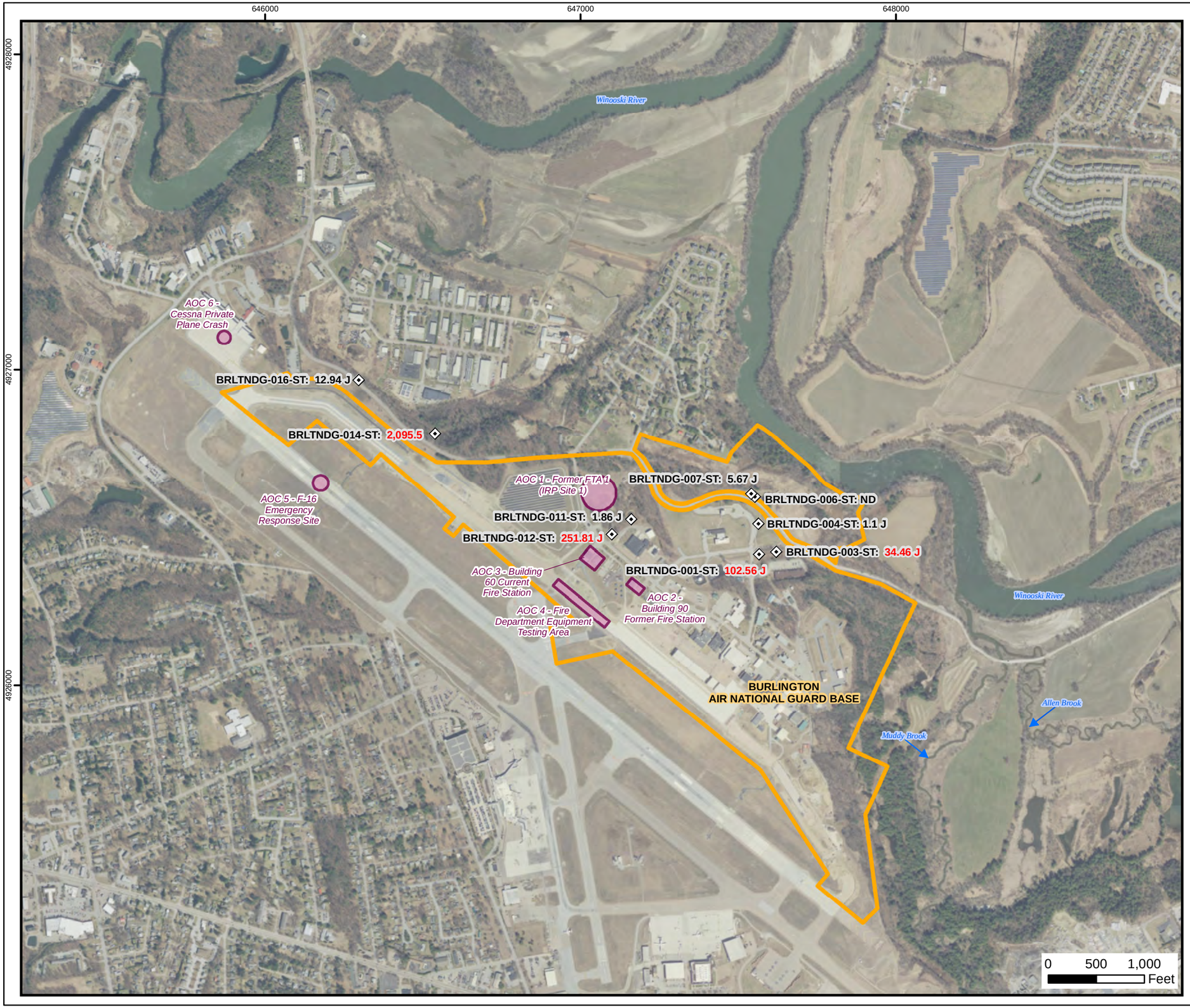


Figure 16
Stormwater Analytical Results
Burlington Air National Guard Base

Legend

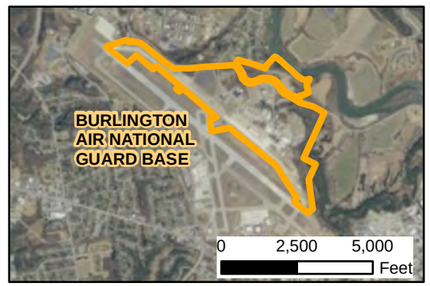
Samples (Red value if exceedance):

- Stormwater Sample
- Area of Concern (AOC)
- Installation Boundary

All samples are from current ESI fieldwork.

-Value shown is the Sum of PFHpA+PFHxS+PFNA+PFOA+PFOS (ng/L)
-Project Action Limit = 20 ng/L

ESI = Expanded Site Inspection
J = Analyte detected, estimated concentration
ng/L = nanograms per liter
PFHpA = perfluoroheptanoic acid
PFHxS = perfluorohexane sulfonic acid
PFNA = perfluorononanoic acid
PFOA = perfluorooctanoic acid
PFOS = perfluorooctane sulfonate



DATA SOURCES
-Image: ESRI, 2018
-ANG Base: Installation Boundary, AOC Boundary, Existing Wells (some locations modified)
-Parsons: ESI samples and results

PARSONS	NATIONAL GUARD BUREAU OPERATIONS DIVISION RESTORATION BRANCH (NGB/A4VR)
DESIGNED BY: RGS	Expanded Site Inspections for Perfluorinated Compounds at Multiple Air National Guard Installations
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SUBMITTED BY: TM	DATE: 2/13/2020; DELIVERY ORDER NUMBER: W9133L-18-F-0052
	Coordinate System: WGS 1984 UTM Zone 18N

PATH: F:\GISCADD\projects\OASIS\GIS\Burlington\Maps\ESI\BURLINGTON_ESI_ST_ONLY.mxd

646000

647000

4927000

4926000

AOC 6 - Cessna Private Plane Crash

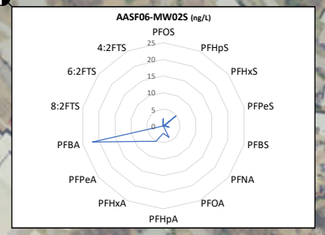
AOC 5 - F-16 Emergency Response Site

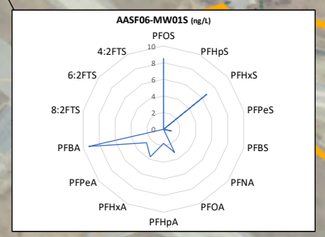
AOC 1 - Former FTA 1 (IRP Site 1)

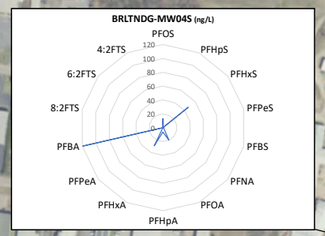
AOC 3 - Building 60 Current Fire Station

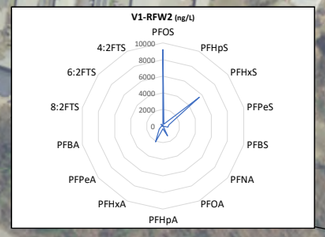
AOC 2 - Building 90 Former Fire Station

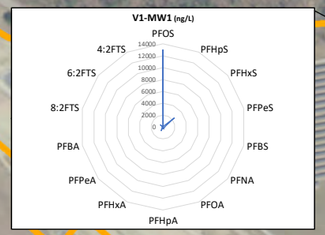
AOC 4 - Fire Department Equipment Testing Area

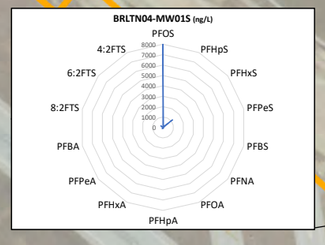


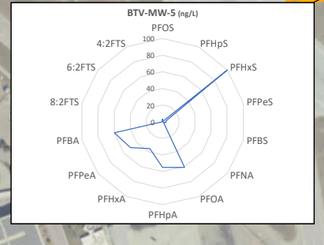


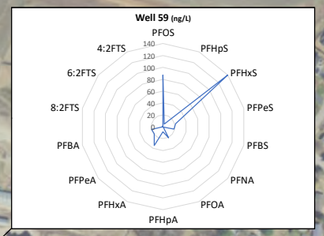


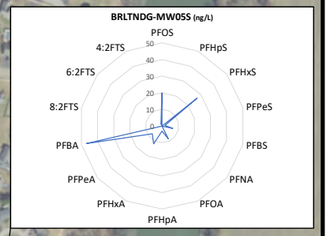


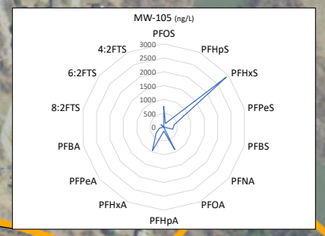


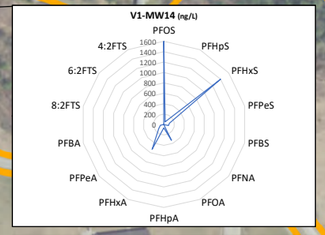


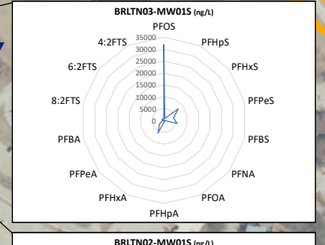


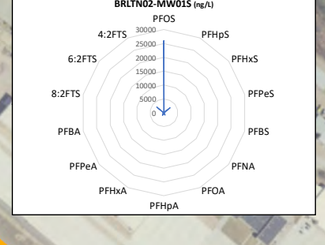










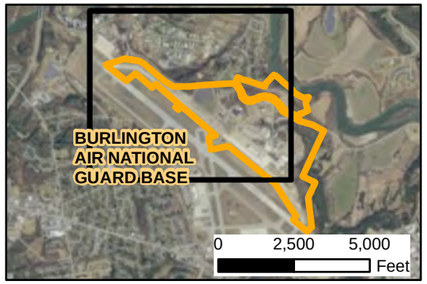


0 275 550 Feet

Figure 17
PFAS Proportional Analysis in Groundwater Burlington Air National Guard Base

Legend

- Groundwater Monitoring Well
- Agricultural Well
- Inferred Shallow Groundwater Flow Direction
- Area of Concern (AOC)
- Installation Boundary

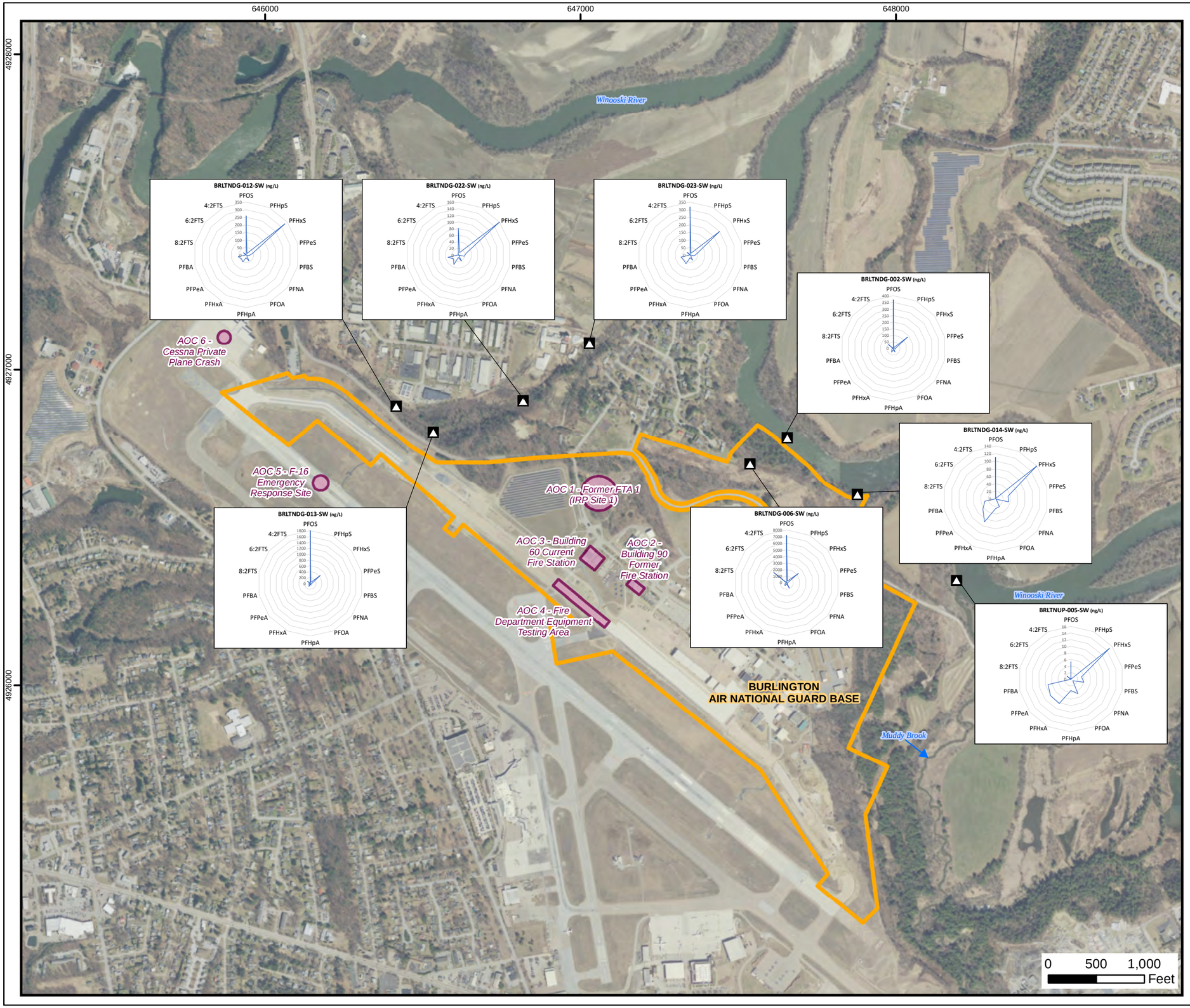


DATA SOURCES
-Image: ESRI, 2018
-ANG Base: Installation Boundary, AOC Boundary
-Parsons: Sample locations and results
-SI Report (Aerostar SES LLC, 2018): SI Samples

PARSONS	NATIONAL GUARD BUREAU OPERATIONS DIVISION RESTORATION BRANCH (NGB/A4VR)
DESIGNED BY: RGS	Expanded Site Inspections for Perfluorinated Compounds at Multiple Air National Guard Installations
DRAWN BY: RGS	
CHECKED BY: TM	SCALE: AS SHOWN; CONTRACT NUMBER: GS00Q140A DU127
SUBMITTED BY: TM	DATE: 2/13/2020; DELIVERY ORDER NUMBER: W9133L-18-F-0052
	Coordinate System: WGS 1984 UTM Zone 18N

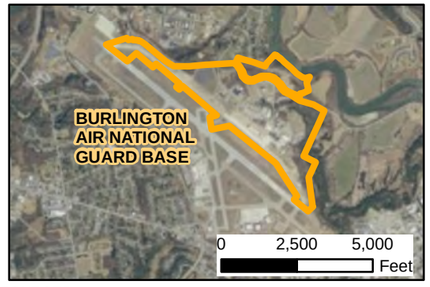
PATH: F:\GISCADD\projects\OASIS\GIS\Burlington\Maps\ESI\BURLINGTON_ESI_GW_radar_charts.mxd

Figure 18
PFAS Proportional Analysis in Surface Water
Burlington Air National Guard Base



Legend

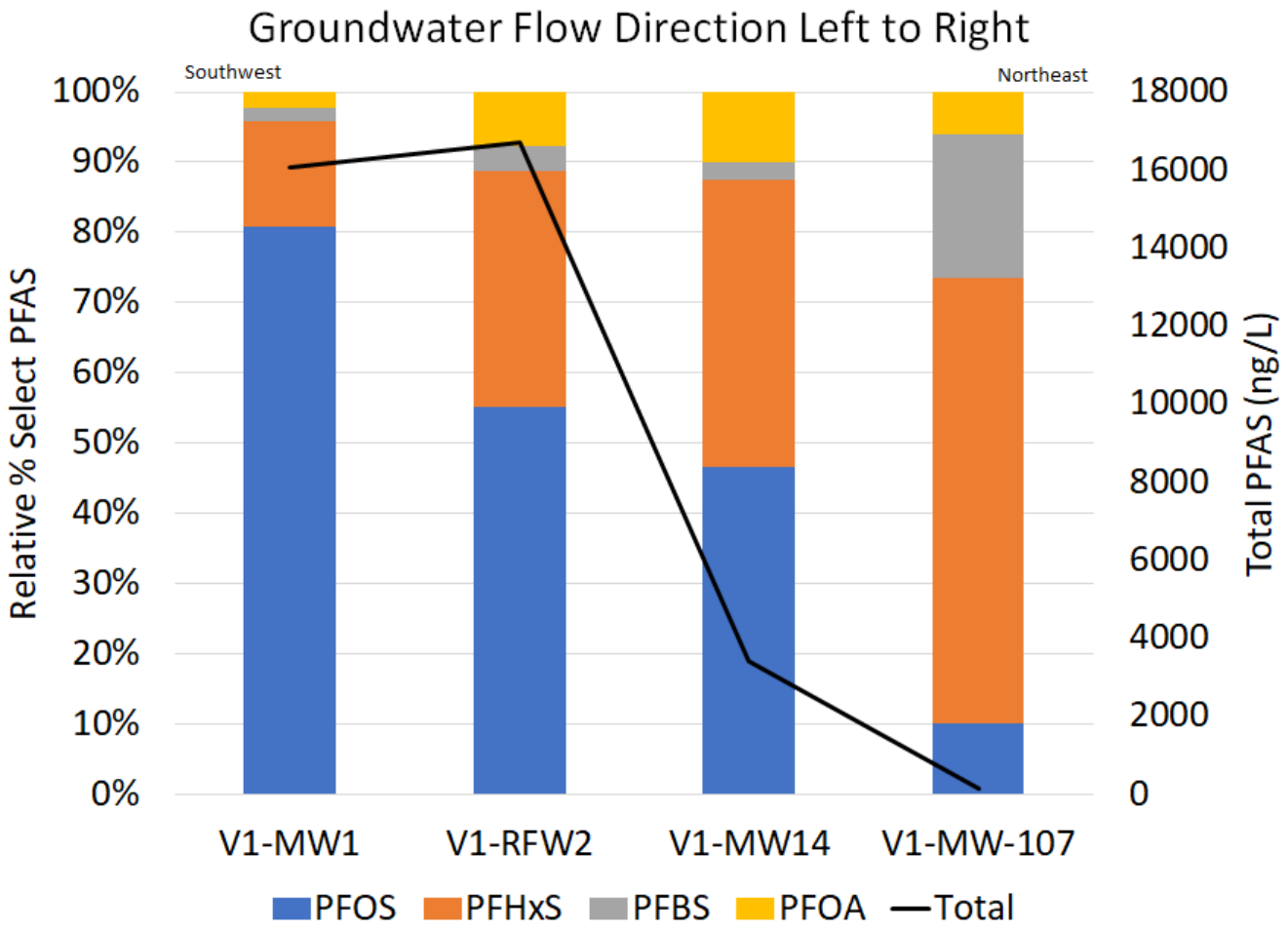
- Surface Water Sample
- Area of Concern (AOC)
- Installation Boundary



DATA SOURCES
-Image: ESRI, 2018
-ANG Base: Installation Boundary, AOC Boundary
-Parsons: Sample locations and results
-SI Report (Aerostar SES LLC, 2018): SI Samples

PARSONS	NATIONAL GUARD BUREAU OPERATIONS DIVISION RESTORATION BRANCH (NGB/A4VR)
DESIGNED BY: RGS	Expanded Site Inspections for Perfluorinated Compounds at Multiple Air National Guard Installations
DRAWN BY: RGS	
CHECKED BY: TM	SCALE: AS SHOWN; CONTRACT NUMBER: GS00Q14OA DU127
SUBMITTED BY: TM	DATE: 2/19/2020; DELIVERY ORDER NUMBER: W9133L-18-F-0052
	Coordinate System: WGS 1984 UTM Zone 18N

PATH: F:\GISCADD\projects\OASIS\GIS\Burlington\Maps\ESI\BURLINGTON_ESI_SW_radar_charts.mxd



Note declining total concentration of PFAS and declining PFOS proportion relative to increasing PFHxS, PFBS, and PFOA in downgradient groundwater flow direction from AOC 1, Former FTA 1 (IRP Site 1).

Figure 19

PFAS Proportional Analysis
Downgradient of AOC 1
Burlington Air National Guard Base

Expanded Site Inspections for
Perfluorinated Compounds at
Multiple Air National Guard Installations

PARSONS

APPENDIX A Daily Field Summary Reports

DAILY FIELD SUMMARY REPORT

Site Name: Burlington

AOC: General

Date: 05/29/2019

Weather:

Temperature °F	Wind Speed mph	Wind Direction	Sky	Precipitation
58	5	NW	Partly Cloudy	None

Parsons Personnel: Dan Chamberland, Tom Horn, Aaron Sutton, Kylah Wyatt

Site Visitors/ Contractors:

Company/ Agency	Name	Job Title/ Description	Work Performed
See below			

Safety: Initial health and safety kick-off meeting held.

Plans for the Day: Mobilization of drillers equipment and sampling equipment/materials.

General Comments: Drillers equipment includes two flat-bed trucks, two trailers and a Mini-sonic LAR rig # 10-01422 drill rig.

Note:

Surface Geophysics for Utility Clearance:

No activity.

Utility Clearance:

Mobilization for ESI work included utility clearance onsite, Drilling contractor equipment staging and Parsons receipt and inspection of delivered materials.

DAILY FIELD SUMMARY REPORT

Water Level Measurements

No activity.

Soil Borings:

No activity.

Clean Earth Systems	Driver	Driver	Delivery of 7 drums and 8 totes.
Old Dominion Trucking	Drivr	Driver	Delivery of IDW bag.
ANG	Pete Dufault	Environmental Manager	Attends health and safety meeting.
Jacobs Engineering	Mike Cunningham	Technician	Attends health and safety meeting.
P &P Septic	Driver	Driver	Delivery of portable toilet and wash station
Vermont Gas	Eric Laroche	Facilities Locator	Review maps of proposed drilling locations and place mark-outs as appropriate.
Cascade Drilling	Larry Turner	Driller	Boring and monitor well installation.
Cascade	Jacob Smith	Drillers helper	Drilling efforts
Cascade	Matt McCormick	Drillers helper	Drilling support

Nested Wells:

No activity.

Deep Wells:

No activity.

Wells Developed:

No activity.

Slug Tests:

No activity.

Surface Water Samples:

No activity.

DAILY FIELD SUMMARY REPORT

Sediment Samples:

No activity.

Stormwater Samples:

No activity.

Surface Soil Samples:

No activity.

Instrument Survey:

No activity.

IDW Management:

No activity.

Water/Liquid Drums	Soil Drums	PPE/Debris Drums

Drums were moved to the following area:

DAILY FIELD SUMMARY REPORT

Site Name: Burlington

AOC: 1 and general

Date: 05/30/2019

Weather:

Temperature (°F)	Wind Speed (mph)	Wind Direction	Sky	Precipitation
60	5	NW	Sunny	None

Parsons Personnel: Dan Chamberland, Tom Horn, Aaron Sutton, Kylah Wyatt

Contractors: Cascade drilling crew: Driller Larry Turner and helpers Jacob Smith and Matt McCormick.

Site Visitors:

Safety: Health and safety kick-off meeting held prior to commencing work activities.

Plans for the Day: Drilling at boring locations BRLTN -003-SO and BRLTN-004-SO for collection of soil and QA samples.

Perform collection of synoptic water levels.

General Comments:

Note:

PARSONS

DAILY FIELD SUMMARY REPORT

Surface Geophysics for Utility Clearance:

No activity.

Utility Clearance:

No activity.

Water Level Measurements

Collected the complete round of synoptic measurements at the planned 21 wells. The crew had to cut the lock on MW-101.

Soil Borings:

BRLTN-003-SO and BRLTN-004-SO.

Shallow or Colocated Wells:

No activity.

Deep Wells:

No activity.

Wells Developed:

No activity.

Slug Tests:

No activity.

Surface Water Samples:

No activity.

Sediment Samples:

No activity.

Stormwater Samples:

DAILY FIELD SUMMARY REPORT

No activity.

DAILY FIELD SUMMARY REPORT

Surface Soil Samples:

Soil samples collected included BRLTN-003-SO-5.0-5.5, BRLTN-093-SO-5.0-5.5, BRLTN-003-SO-7.0-7.5, BRLTN-004-SO-5.0-5.5, BRLTN-004-SO-6.0-6.5.

Instrument Survey:

No activity.

IDW Management:

No activity.

Water/Liquid Drums	Soil Drums	PPE/Debris Drums
1 tote in progress		

Drums were moved to the following area:

Miscellaneous Notes:

PARSONS

DAILY FIELD SUMMARY REPORT

Site Name:	Burlington
AOC:	6
Date:	05/31/2019

Weather:

Temperature (°F)	Wind Speed (mph)	Wind Direction	Sky	Precipitation
68	5	NW	Partly Cloudy	None

Parsons Personnel:	Dan Chamberland, Tom Horn, Aaron Sutton, Kylah Wyatt
Contractors:	Cascade Drilling: Driller - Larry Turner, Helpers - Jacob Smith and Matt McCormick.
Site Visitors:	Eric Laroche of Vermont Gas onsite at AOC 6 to confirm that the area for relocation of AASF-06-MW-02S does not conflict with in-place underground utilities.
Safety:	The 5-31-19 Morning health and safety meetings including Parsons and Cascade.
Plans for the Day:	5-31-19 Drilling and installation of monitor wells AASF-06-MW-02-S/D and AASF-06-MW-03S in AOC 6. Development of existing monitor wells.
General Comments:	Drilling attempted at AASF-06-MW-02-S/D location was thwarted by shallow bedrock. Drillers request to relocate AASF-06-MW-03S ~10 feet east due to the excessive slope at the proposed location. Propose a relocation of AASF-06-MW-02-S/D ~300' to the north.
Note:	

DAILY FIELD SUMMARY REPORT

Surface Geophysics for Utility Clearance:

No activity.

Utility Clearance:

No activity.

Water Level Measurements

No activity.

Soil Borings:

The AASF-06-MW-03S boring was installed to 16'-depth BGS, ~ 6' into bedrock. Cascade input ~ 120-gallons of water during bedrock coring.

Shallow or Colocated Wells:

No activity.

Deep Wells:

No activity.

Wells Developed:

MW-107 completed, V1-MW-105 started, 66% complete.

Slug Tests:

No activity.

Surface Water Samples:

No activity.

Sediment Samples:

No activity.

Stormwater Samples:

No activity.

DAILY FIELD SUMMARY REPORT

PARSONS

DAILY FIELD SUMMARY REPORT

Surface Soil Samples:

No activity.

Instrument Survey:

No activity.

IDW Management:

No activity.

Water/Liquid Drums	Soil Drums	PPE/Debris Drums

Drums were moved to the following area:

Miscellaneous Notes:

DAILY FIELD SUMMARY REPORT

Site Name: Burlington

AOC: 6, 1, 4

Date: 06/01/2019

Weather:

Temperature (°F)	Wind Speed (mph)	Wind Direction	Sky	Precipitation
65	5	NW	Overcast	

Parsons Personnel: Dan Chamberland, Tom Horn, Aaron Sutton, Kylah Wyatt

Contractors: Cascade: Driller - Larry Turner, Helpers - Jacob Smith and Matt McCormick.

Site Visitors: None.

Safety: Health and Safety kick-off meetings held by Parsons and Cascade.
A near-miss was observed when a hose flapped around when driller helper was filling a tote with water from the fire hydrant prompting Parsons to Stop Work. The incident also required a 'take-five' discussion by Cascade. Parsons site health and safety officer was informed of and provided a description of the incident and the resultant root-cause analysis results determined by Parsons.

Plans for the Day: Development of existing wells.
Well installation at AASF-06-MW-03S. Boring and well installation at AASF-06-MW-02S.

General Comments: Well construction and well development was performed in accordance with the site work plan and SOPs.

Note:

PARSONS

DAILY FIELD SUMMARY REPORT

Surface Geophysics for Utility Clearance:

No activity.

Utility Clearance:

No activity.

Water Level Measurements

No activity.

Soil Borings:

No activity.

Shallow or Colocated Wells:

Completed well installation at AASF-06-MW-03S. Performed boring and well installation at AASF-06-MW-02S.

Deep Wells:

No activity.

Wells Developed:

Development was completed for MW-105, V4-MW414, V4-MW413, MW-401, MW-405, and MW-403. Development at V4-BR03 was initiated, with 40 gallons removed.

Slug Tests:

No activity.

Surface Water Samples:

No activity.

Sediment Samples:

No activity.

Stormwater Samples:

No activity.

DAILY FIELD SUMMARY REPORT

Surface Soil Samples:

No activity.

Instrument Survey:

No activity.

IDW Management:

Water/Liquid Drums	Soil Drums	PPE/Debris Drums
1 tote	3 drums	

Drums were moved to the following area:

1 drum of soil cuttings from AOC 1 is stored at AOC 1. 2 drums of soil cuttings from AOC 6 are stored at Army Aviation Support Facility. Final disposition will be depending pending analysis.

Miscellaneous Notes:

DAILY FIELD SUMMARY REPORT

Site Name:	Burlington
AOC:	6
Date:	06/02/2019

Weather:

Temperature (°F)	Wind Speed (mph)	Wind Direction	Sky	Precipitation
63	5	S	Overcast	Rain

Parsons Personnel:	Dan Chamberland, Tom Horn, Aaron Sutton, Kylah Wyatt
Contractors:	Cascade: Driller - Larry Turner, Helpers - Jacob Smith and Matt McCormick.
Site Visitors:	
Safety:	Parsons and Cascade Health and Safety kick-off meetings held. Embedded deer tick removed from the neck of Aaron Sutton. The incident was reported per site document protocols.
Plans for the Day:	Storm water sampling/GW sampling/monitor well development. Flush-mount casing and concrete pad construction at AOC 6, demobilization from AOC 6. Staging of soil drums at AOC 6/transfer of wastewater from AOC 6 to AOC 1. Decontamination of drilling equipment. Stage the drill rig at the next location in AOC 3 at BRLTN03-MW01S/D.
General Comments:	Groundwater samples collected from MW-405 and MW-401. The samples were maintained on ice in a cooler for delivery to the lab tomorrow.
Note:	

DAILY FIELD SUMMARY REPORT

Surface Geophysics for Utility Clearance:

No activity.

Utility Clearance:

No activity.

Water Level Measurements

No activity.

Soil Borings:

No activity.

Shallow or Colocated Wells:

Flush-mount casing and concrete pad construction at AASF06-MW02S and AASF06-MW03S.

Deep Wells:

No activity.

Wells Developed:

Continued development at BR03. 10 additional gallons removed. 50-gallons total.

Slug Tests:

No activity.

Surface Water Samples:

No activity.

Sediment Samples:

No activity.

Stormwater Samples:

No activity. Insufficient stormwater runoff to collect samples.

DAILY FIELD SUMMARY REPORT

Surface Soil Samples:

No activity.

Instrument Survey:

No activity.

IDW Management:

Water/Liquid Drums	Soil Drums	PPE/Debris Drums
1 tote in progress	3	

Drums were moved to the following area:

1 drum of soil cuttings from AOC 1 is stored at AOC 1. 2 drums of soil cuttings from AOC 6 are stored at Army Aviation Support Facility. Final disposition will be depending pending analysis.

Miscellaneous Notes:

DAILY FIELD SUMMARY REPORT

Site Name:	Burlington
AOC:	3
Date:	06/03/2019

Weather:

Temperature (°F)	Wind Speed (mph)	Wind Direction	Sky	Precipitation
55	15	W	Partly Cloudy	Rain

Parsons Personnel:	Dan Chamberland, Tom Horn, Aaron Sutton, Kylah Wyatt
Contractors:	Cascade: Driller - Larry Turner, Helpers - Jacob Smith and Matt McCormick.
Site Visitors:	
Safety:	Parsons and Cascade Health and Safety kick-off meetings. Upon being provided an approval drilling at the BRLNT 03-MW001S/D locations as of last Friday and having discussed the planned drilling effort with both of our two site contacts - Peter Dufault and Shannon Kelly - prior to the start of drilling this morning, a Near Miss incident occurred at this location. While drilling at a depth of about 55-feet, a representative from USACE (Bob Letourneau) informed Parsons that he was awaiting an additional communication line mark-out. Parsons stopped work to determine how the miscommunication occurred. It was later determined that USACE understood that drilling at this location was to start the following week at the earliest and delayed the mark-out. A lesson learned by Parsons is that they should take ownership of the location regarding communication by taking extra steps to verify directly with those directly responsible for confirmation of utilities clearance. Further, Parsons personnel met to discuss and plan for the incorporation of changes to the documentation process to promote standards Fail-Safe measures for mitigation of such risks moving forward.
Plans for the Day:	Soil boring and monitor well installation. Well development GW sampling
General Comments:	Groundwater samples collected from V1-MW-107, V1-MW14, and V4-MW413. The samples were maintained on ice in a cooler until delivery to the lab.
Note:	

DAILY FIELD SUMMARY REPORT

Surface Geophysics for Utility Clearance:

No activity.

Utility Clearance:

Additional mark-out to be performed prior to drilling the BRLTN03-MW01S boring.

Water Level Measurements

No activity.

Soil Borings:

BRLTN03-MW01D

Shallow or Colocated Wells:

No activity.

Deep Wells:

No activity.

Wells Developed:

BR03 and BR06.

Slug Tests:

No activity.

Surface Water Samples:

No activity.

Sediment Samples:

No activity.

Stormwater Samples:

No activity.

DAILY FIELD SUMMARY REPORT

Surface Soil Samples:

No activity.

Instrument Survey:

No activity.

IDW Management:

Water/Liquid Drums	Soil Drums	PPE/Debris Drums
1 tote	4 drums	

Drums were moved to the following area:

1 drum of soil cuttings from AOC 1 is stored at AOC 1. 2 drums of soil cuttings from AOC 6 are stored at Army Aviation Support Facility. Final disposition will be depending pending analysis. 1 drum of soil cuttings temporarily stored at AOC 3.

Miscellaneous Notes:

DAILY FIELD SUMMARY REPORT

Site Name: Burlington

AOC: 3

Date: 06/04/2019

Weather:

Temperature (°F)	Wind Speed (mph)	Wind Direction	Sky	Precipitation
55	20	W	Partly Cloudy	Rain

Parsons Personnel: Dan Chamberland, Tom Horn, Aaron Sutton, Kylah Wyatt

Contractors: Cascade: Driller - Larry Turner, Helpers - Jacob Smith and Matt McCormick.

Site Visitors:

Safety: Health and Safety kick-off meeting with Parsons and Cascade.
Near-miss incident observed during attempts at grouting by Cascade. The impeller housing on one of their centrifugal pumps ruptured, spraying grout over the surrounding area and Jacob's chest and face. The destroyed equipment was disposed, the area was rinsed with water and Jacob - who was wearing his eye protection - washed his impacted skin and changed his shirt.

Plans for the Day: Soil Boring at BRLTN03-MW01D
Install well at BRLTN03-MW01D
Sampling and development of existing wells

General Comments: Groundwater sample collected from MW-403. The sample was maintained on ice in a cooler until delivery to the lab.

Note:

PARSONS

DAILY FIELD SUMMARY REPORT

Surface Geophysics for Utility Clearance:

No activity.

Utility Clearance:

No activity.

Water Level Measurements

No activity.

Soil Borings:

No activity.

Shallow or Colocated Wells:

No activity.

Deep Wells:

Completed boring BRLTN03-MW01D to 80 feet below ground surface (bgs); installed monitoring well with screen from 70 to 80 feet bgs.

Wells Developed:

BTV-MW-05, V1-MW-106, V1-MW1, and V4-MW-5.

Slug Tests:

No activity.

Surface Water Samples:

No activity.

Sediment Samples:

No activity.

Stormwater Samples:

No activity.

DAILY FIELD SUMMARY REPORT

Surface Soil Samples:

No activity.

Instrument Survey:

No activity.

IDW Management:

Water/Liquid Drums	Soil Drums	PPE/Debris Drums
2 totes	4	

Drums were moved to the following area:

1 drum of soil cuttings from AOC 1 is stored at AOC 1. 2 drums of soil cuttings from AOC 6 are stored at Army Aviation Support Facility. Final disposition will be depending pending analysis. 2 drums of soil cuttings temporarily stored at AOC 3.

Miscellaneous Notes:

DAILY FIELD SUMMARY REPORT

Site Name:	Burlington
AOC:	3
Date:	06/05/2019

Weather:

Temperature (°F)	Wind Speed (mph)	Wind Direction	Sky	Precipitation
65	5	NE	Overcast	Rain

Parsons Personnel:	Dan Chamberland, Tom Horn, Aaron Sutton, Kylah Wyatt
Contractors:	Cascade: Driller - Larry Turner, Helpers - Jacob Smith and Matt McCormick.
Site Visitors:	Bob LeTourneau of USACE confirmed that the proposed BRLTN03-MW01S location is clear of underground utilities.
Safety:	Health and Safety kick-off meeting held with Parsons and Cascade.
Plans for the Day:	Complete grouting at BRLTN03-MW01D. Hand auger to 5'-depth for preclearance of underground utilities at BRLTN03-MW01S and BRLTNDG-MW01S/D. Soil boring to 25' BGS at BRLTN03-MW01S. Transfer cuttings to staging area at the AOC 1 location. Well Development
General Comments:	Completed grouting at BRLTN03-MW01D. Hand augered to 5'-depth for preclearance of underground utilities at BRLTN03-MW01S and BRLTNDG-MW01S/D. Completed soil boring to 25' BGS at BRLTN03-MW01S. Transferred labeled drummed cuttings to staging area at the AOC 1 location.
Note:	

PARSONS

DAILY FIELD SUMMARY REPORT

Surface Geophysics for Utility Clearance:

No activity.

Utility Clearance:

Bob LeTourneau of USACE confirmed that the proposed BRLTN03-MW01S location is clear of underground utilities.

Water Level Measurements

No activity.

Soil Borings:

BRLTN03-MW01S

Shallow or Colocated Wells:

BRLTN03-MW01S boring completed. Monitor well to be installed.

Deep Wells:

BRLTN03-MW01D requires a concrete pad and flush-mount protective casing.

Wells Developed:

Developed BTV-MW-9, BTV-MW-14, V1-RFW-2, and V1-MW12.

Slug Tests:

No activity.

Surface Water Samples:

No activity.

Sediment Samples:

No activity.

Stormwater Samples:

No activity.

DAILY FIELD SUMMARY REPORT

Surface Soil Samples:

No activity.

Instrument Survey:

No activity.

IDW Management:

Water/Liquid Drums	Soil Drums	PPE/Debris Drums
2 totes	5	

Drums were moved to the following area:

1 drum of soil cuttings from AOC 1 is stored at AOC 1. 2 drums of soil cuttings from AOC 6 are stored at Army Aviation Support Facility. Final disposition will be depending pending analysis. 3 drums of soil cuttings temporarily stored at AOC 1 until being thin spread at AOC 1.

Miscellaneous Notes:

DAILY FIELD SUMMARY REPORT

Site Name: Burlington

AOC: 3 and downgradient areas

Date: 06/10/2019

Weather:

Temperature (°F)	Wind Speed (mph)	Wind Direction	Sky	Precipitation
80	10	S	Sunny	None

Parsons Personnel: Aaron Sutton, Dan Chamberland, Kylah Wyatt, Tom Horn, Dan Griffiths

Contractors: Cascade: Driller - Larry Turner, Helpers - Jacob Smith and Bill Lindsey

Site Visitors: None

Safety: Health and Safety kick-off meetings held with Parsons and Cascade.

Plans for the Day: Groundwater, surface water and sediment sampling and well installation.

General Comments: Groundwater samples collected from:
MW-105-01
V1-BR-08-01
V1-MW1-01
V1-MW-106-01
V1-MW12-01
V1-RFW2-01

Note:

DAILY FIELD SUMMARY REPORT

Surface Geophysics for Utility Clearance:

No activity.

Utility Clearance:

No activity.

Water Level Measurements

No activity.

Soil Borings:

No activity.

Shallow or Colocated Wells:

Installed BRLTN03-MW01S.

Deep Wells:

No activity.

Wells Developed:

No activity.

Slug Tests:

No activity.

Surface Water Samples:

BRLTNDG-002-SW, BRLTNDG-011-SW, BRLTNDG-012-SW and BRLTNDG-014-SW.

Sediment Samples:

BRLTNDG-002-SD, BRLTNDG-011-SD, BRLTNDG-012-SD and BRLTNDG-014-SD.

Stormwater Samples:

No activity.

DAILY FIELD SUMMARY REPORT

PARSONS

DAILY FIELD SUMMARY REPORT

Surface Soil Samples:

No activity.

Instrument Survey:

No activity.

IDW Management:

Water/Liquid Drums	Soil Drums	PPE/Debris Drums
2 totes	7	

Drums were moved to the following area:

1 drum of soil cuttings from AOC 1 is stored at AOC 1. 2 drums of soil cuttings from AOC 6 are stored at Army Aviation Support Facility. Final disposition will be depending pending analysis. 3 drums of AOC 3 soil cuttings temporarily stored at AOC 1 until being thin spread at AOC 1.

Miscellaneous Notes:

DAILY FIELD SUMMARY REPORT

Site Name: Burlington

AOC: Upgradient

Date: 06/11/2019

Weather:

Temperature (°F)	Wind Speed (mph)	Wind Direction	Sky	Precipitation
67	15	NW	Partly Cloudy	Rain

Parsons Personnel: Dan Chamberland, Tom Horn, Aaron Sutton, Kylah Wyatt, Dan Griffiths

Contractors: Cascade: Driller - Larry Turner, Helpers - Jacob Smith and Bill Lindsey

Site Visitors: Richard Spiese, Vermont Department of Conservation regulator

Safety: Health and Safety Kick-off meeting held with Parsons and Cascade.

Plans for the Day: Soil boring for monitor well installation at BRLTNDG-MW01D location

General Comments:

Water encountered at ~60' BGS.

Groundwater samples collected today:

BTV-MW-5-01

MW-101-01

V4-MW-5-01

Well59-01

Note:

DAILY FIELD SUMMARY REPORT

Surface Geophysics for Utility Clearance:

No activity.

Utility Clearance:

No activity.

Water Level Measurements

No activity.

Soil Borings:

No activity.

Shallow or Colocated Wells:

No activity.

Deep Wells:

No activity.

Wells Developed:

No activity.

Slug Tests:

No activity.

Surface Water Samples:

No activity.

Sediment Samples:

No activity.

Stormwater Samples:

BRLTNDG-001-ST, BRLTNDG-007-ST, BRLTNDG-011-ST, BRLTNDG-012-ST, BRLTNDG-014-ST and BRLTNDG-016-ST.

DAILY FIELD SUMMARY REPORT

No enough flow to collect a sample at other locations.

DAILY FIELD SUMMARY REPORT

Surface Soil Samples:

No activity.

Instrument Survey:

No activity.

IDW Management:

Water/Liquid Drums	Soil Drums	PPE/Debris Drums
2 totes	8	

Drums were moved to the following area:

1 drum of soil cuttings from AOC 1 is stored at AOC 1. 2 drums of soil cuttings from AOC 6 are stored at Army Aviation Support Facility. Final disposition will be depending pending analysis. 3 drums of AOC 3 and 1 drum of DG soil cuttings temporarily stored at AOC 1 until being thin spread at AOC 1.

Miscellaneous Notes:

DAILY FIELD SUMMARY REPORT

Site Name:	Burlington
AOC:	Downgradient
Date:	06/12/2019

Weather:

Temperature (°F)	Wind Speed (mph)	Wind Direction	Sky	Precipitation
68	15	S	Sunny	None

Parsons Personnel:	Dan Chamberland, Tom Horn, Aaron Sutton, Kylah Wyatt
Contractors:	Cascade: Driller - Larry Turner, Helpers - Jacob Smith and Bill Lindsey.
Site Visitors:	None
Safety:	Health and Safety kick-off meeting held with Parsons and Cascade.
Plans for the Day:	Groundwater sampling at BTV-MW-14 and BTV-MW-9 Development of AASF06-MW02S and AASF06-MW03S. Flush-mount protective casing installation and concrete pad construction at BRLTN03-MW01S and BRLTN03-MW01D. Soil boring and monitor well installations at BRLTNDG-MW01S and BRLTNDG-MW01D.
General Comments:	Groundwater samples collected today were hand-delivered to Test America along with samples collected yesterday. Groundwater samples collected at wells BTV-MW-14 and BTV-MW-9 today.
Note:	

DAILY FIELD SUMMARY REPORT

Surface Geophysics for Utility Clearance:

No activity.

Utility Clearance:

No activity.

Water Level Measurements

No activity.

Soil Borings:

The soil boring for BRLTNDG-MW01D was completed. The soil boring for BRLTNDG-MW01S was initiated. Achieved a depth of 40-feet with no water observed.

Shallow or Colocated Wells:

BRLTN03-MW01S pad installed. BRLTNDG-MW01S not yet installed.

Deep Wells:

BRLTN03-MW01D pad installed. BRLTNDG-MW01D well construction on hold pending delivery of 5' well screens expected by tomorrow morning.

Wells Developed:

Development of AASF06-MW02S and AASF06-MW03S was begun. Each well was purged dry.

Slug Tests:

No activity.

Surface Water Samples:

No activity.

Sediment Samples:

No activity.

Stormwater Samples:

No activity.

DAILY FIELD SUMMARY REPORT

PARSONS

DAILY FIELD SUMMARY REPORT

Surface Soil Samples:

No activity.

Instrument Survey:

No activity.

IDW Management:

Water/Liquid Drums	Soil Drums	PPE/Debris Drums
2 totes	9	

Drums were moved to the following area:

1 drum of soil cuttings from AOC 1 is stored at AOC 1. 2 drums of soil cuttings from AOC 6 are stored at Army Aviation Support Facility. Final disposition will be depending pending analysis. 3 drums of AOC 3 and 2 drums of DG soil cuttings temporarily stored at AOC 1 until being thin spread at AOC 1.

Miscellaneous Notes:

DAILY FIELD SUMMARY REPORT

Site Name: Burlington

AOC: Downgradient

Date: 06/13/2019

Weather:

Temperature (°F)	Wind Speed (mph)	Wind Direction	Sky	Precipitation
62	20	S	Overcast	Rain

Parsons Personnel: Dan Chamberland, Tom Horn, Aaron Sutton, Kylah Wyatt

Contractors: Cascade: Driller - Larry Turner, Helpers - Jacob Smith and Bill Lindsey.

Site Visitors: None.

Safety: Health and Safety kick-off meeting held with Parsons and Cascade in attendance.

Plans for the Day:
Complete the boring for BRLTNDG-MW01S
Install monitor wells BRLTNDG-MW01D and BRLTNDG-MW01S
Continue development at AASF06-MW02S and AASF06-MW03S
Collect surface water and sediment samples.

General Comments:

Note:

DAILY FIELD SUMMARY REPORT

Surface Geophysics for Utility Clearance:

No activity.

Utility Clearance:

No activity.

Water Level Measurements

No activity.

Soil Borings:

Completed boring BRLTNDG-MW01S

Shallow or Colocated Wells:

Installed BRLTNDG-MW01S

Deep Wells:

Installed BRLTNDG-MW01S

Wells Developed:

Completed development at AASF06-MW03S. Continued development at AASF06-MW02S.

Slug Tests:

No activity.

Surface Water Samples:

BRLTNDG-001-SW, BRLTNDG-003-SW, BRLTNDG-004-SW, BRLTNDG-006-SW, BRLTNDG-007-SW, BRLTNDG-008-SW, BRLTNDG-009-SW, BRLTNDG-010-SW, BRLTNDG-013-SW.

Sediment Samples:

BRLTNDG-001-SD, BRLTNDG-003-SD, BRLTNDG-004-SD, BRLTNDG-005-SD, BRLTNDG-006-SD, BRLTNDG-008-SD, BRLTNDG-009-SD, BRLTNDG-010-SD, BRLTNDG-013-SD.

Stormwater Samples:

No activity.

DAILY FIELD SUMMARY REPORT

PARSONS

DAILY FIELD SUMMARY REPORT

Surface Soil Samples:

No activity.

Instrument Survey:

No activity.

IDW Management:

Water/Liquid Drums	Soil Drums	PPE/Debris Drums
2 totes	11	

Drums were moved to the following area:

1 drum of soil cuttings from AOC 1 is stored at AOC 1. 2 drums of soil cuttings from AOC 6 are stored at Army Aviation Support Facility. Final disposition will be depending pending analysis. 3 drums of AOC 3 and 4 drums of DG soil cuttings temporarily stored at AOC 1 until being thin spread at AOC 1.

Miscellaneous Notes:

DAILY FIELD SUMMARY REPORT

Site Name: Burlington

AOC: 2

Date: 06/14/2019

Weather:

Temperature (°F)	Wind Speed (mph)	Wind Direction	Sky	Precipitation
62	15	SW	Overcast	Rain

Parsons Personnel: Dan Chamberland, Tom Horn, Aaron Sutton, Kylah Wyatt

Contractors: Cascade: Driller - Larry Turner, Helpers - Jacob Smith and Bill Lindsey.

Site Visitors: None.

Safety: Health and Safety kick-off meeting held with Parsons and Cascade in attendance.

Plans for the Day:
Soil borings and monitor well installations at BRLTN02-MW01S/D.
Development of BRLTN03-MW01S/D.
Completion of grouting at BRLTNDG-MW01S/D.
Collection of groundwater samples at V4-BR03 and V4-MW414.

General Comments: Groundwater samples collected at V4-BR03 and V4-MW414.

Note:

DAILY FIELD SUMMARY REPORT

Surface Geophysics for Utility Clearance:

No activity.

Utility Clearance:

No activity.

Water Level Measurements

No activity.

Soil Borings:

Began boring at BRLTN02-MW01D. Reached 55'.

Shallow or Colocated Wells:

Completed grouting, protective flush-mount casing and concrete pad installation at BRLTNDG-MW01S.

Deep Wells:

Completed grouting, protective flush-mount casing and concrete pad installation at BRLTNDG-MW01D.

Wells Developed:

BRLTN03-MW01S/D.

Slug Tests:

No activity.

Surface Water Samples:

No activity.

Sediment Samples:

No activity.

Stormwater Samples:

No activity.

DAILY FIELD SUMMARY REPORT

PARSONS

DAILY FIELD SUMMARY REPORT

Surface Soil Samples:

No activity.

Instrument Survey:

No activity.

IDW Management:

Water/Liquid Drums	Soil Drums	PPE/Debris Drums
2 totes		

Drums were moved to the following area:

1 drum of soil cuttings from AOC 1 is stored at AOC 1. 2 drums of soil cuttings from AOC 6 are stored at Army Aviation Support Facility. Final disposition will be depending pending analysis. 3 drums of AOC 3 were thin spread at AOC 1. 4 drums of DG and 2 drums of AOC 2 soil cuttings temporarily stored at AOC 1 until being thin spread at AOC 1.

Miscellaneous Notes:

DAILY FIELD SUMMARY REPORT

Site Name: Burlington

AOC: 2

Date: 06/15/2019

Weather:

Temperature (°F)	Wind Speed (mph)	Wind Direction	Sky	Precipitation
78	15	S	Mostly Cloudy	None

Parsons Personnel: Dan Chamberland, Tom Horn, Aaron Sutton, Kylah Wyatt

Contractors: Cascade: Driller - Larry Turner, Helpers - Jacob Smith and Bill Lindsey.

Site Visitors:

Safety: Health and Safety kick-off meeting held with Parsons and Cascade in attendance.
Embedded tick removed from the ankle of Aaron Sutton.

Plans for the Day: Complete the borings at BRLTN02-MW01D and BRLTN02-MW01S.
Install the wells at BRLTN02-MW01D and BRLTN02-MW01S.
Complete development at BRLTN03-MW001D.
Collect a groundwater sample from BRLTN03-MW001S.
Spread drummed soil cuttings from AOC 3.
Equipment returns shipped via Fed Ex.

General Comments:

Note:

PARSONS

DAILY FIELD SUMMARY REPORT

Surface Geophysics for Utility Clearance:

No activity.

Utility Clearance:

No activity.

Water Level Measurements

No activity.

Soil Borings:

BRLTN02-MW01D and BRLTN02-MW01S.

Shallow or Colocated Wells:

BRLTN02-MW01S.

Deep Wells:

BRLTN02-MW01D

Wells Developed:

BRLTN03-MW001D.

Slug Tests:

No activity.

Surface Water Samples:

No activity.

Sediment Samples:

No activity.

Stormwater Samples:

No activity.

DAILY FIELD SUMMARY REPORT

PARSONS

DAILY FIELD SUMMARY REPORT

Surface Soil Samples:

No activity.

Instrument Survey:

No activity.

IDW Management:

No activity.

Water/Liquid Drums	Soil Drums	PPE/Debris Drums
3 totes	3	

Drums were moved to the following area:

1 drum of soil cuttings from AOC 1 is stored at AOC 1. 2 drums of soil cuttings from AOC 6 are stored at Army Aviation Support Facility. Final disposition will be depending pending analysis. Other soil cuttings spread at FTA-1.

Miscellaneous Notes:

DAILY FIELD SUMMARY REPORT

Site Name: Burlington

AOC: 2

Date: 06/16/2019

Weather:

Temperature (°F)	Wind Speed (mph)	Wind Direction	Sky	Precipitation
80	3	SW		None

Parsons Personnel: Aaron Sutton, Dan Chamberland, Kylah Wyatt, Tom Horn

Contractors: Cascade: Driller - Larry Turner, Helpers - Jacob Smith and Bill Lindsey.

Site Visitors:

Safety: Health and Safety kick-off meeting held with Parsons and Cascade in attendance.

Plans for the Day:
Complete installations at BRLTN02-MW01D and BRLTN02-MW01D.
Groundwater sampling from AASF06MW03S.
Development of BRLTN03-MW01S/D.
Mapping of seep areas.

General Comments:
Concrete pads and flush-mount casings installed at
BRLTN02-MW01D and BRLTN02-MW01D.
Development of BRLTN03-MW01S/D was performed without assistance from Cascade.

Note:

DAILY FIELD SUMMARY REPORT

Surface Geophysics for Utility Clearance:

No activity.

Utility Clearance:

No activity.

Water Level Measurements

No activity.

Soil Borings:

No activity.

Shallow or Colocated Wells:

BRLTN03-MW01S completed.

Deep Wells:

BRLTN03-MW01D completed.

Wells Developed:

Development of BRLTN03-MW01S/D.

Slug Tests:

No activity.

Surface Water Samples:

No activity.

Sediment Samples:

No activity.

Stormwater Samples:

No activity.

DAILY FIELD SUMMARY REPORT

PARSONS

DAILY FIELD SUMMARY REPORT

Surface Soil Samples:

No activity.

Instrument Survey:

No activity.

IDW Management:

No activity.

Water/Liquid Drums	Soil Drums	PPE/Debris Drums
4 totes	3	

Drums were moved to the following area:

1 drum of soil cuttings from AOC 1 is stored at AOC 1. 2 drums of soil cuttings from AOC 6 are stored at Army Aviation Support Facility. Final disposition will be depending pending analysis. Other soil cuttings spread at FTA-1.

Miscellaneous Notes:

DAILY FIELD SUMMARY REPORT

Site Name: Burlington

AOC: 6

Date: 06/17/2019

Weather:

Temperature (°F)	Wind Speed (mph)	Wind Direction	Sky	Precipitation
80	10	N	Sunny	None

Parsons Personnel: Dan Chamberland, Aaron Sutton, Kylah Wyatt

Contractors: Cascade (Chris Turner, Jake Smith)

Site Visitors: None

Safety: Ticks! We will obtain permetherin and deep woods bug spray for next level tick protection.

Plans for the Day:
Mob/drill AASF06-MW01S
SAMPLE BRLTN03-MW01D
FINISH DEVELOPMENT OF AASF06-MW02S
SAMPLE SHIPPING
Forms on fire QC of SharePoint files.

General Comments:

Note:

DAILY FIELD SUMMARY REPORT

Surface Geophysics for Utility Clearance:

No activity.

Utility Clearance:

No activity.

Water Level Measurements

No activity.

Soil Borings:

No activity.

Shallow or Colocated Wells:

AASF06-MW01S installed well with total depth of 15 ft bgs, 10 ft screen installed. Well pad to be completed 6/18. Installed in bedrock and clay.

Deep Wells:

No activity.

Wells Developed:

AASF06-MW02S - finished development. Added 1.25 gal lab provided PFAS-free water and surged 10 mins.
Coarse sand in bottom of well locked surge block in bottom of well. Was able to retrieve surge block.
Tubing clogged with coarse sand. May be a hole in the screen. No tooling should be placed in wells (surge block, slug, etc).

Slug Tests:

No activity.

Surface Water Samples:

No activity.

Sediment Samples:

No activity.

Stormwater Samples:

DAILY FIELD SUMMARY REPORT

No activity.

Surface Soil Samples:

No activity.

Instrument Survey:

No activity.

IDW Management:

No activity.

Water/Liquid Drums	Soil Drums	PPE/Debris Drums
4 totes	4	

Drums were moved to the following area:

1 drum of soil cuttings from AOC 1 is stored at AOC 1. 3 drums of soil cuttings from AOC 6 are stored at Army Aviation Support Facility. Final disposition will be depending pending analysis. Other soil cuttings spread at FTA-1.

Miscellaneous Notes:

DAILY FIELD SUMMARY REPORT

Site Name:	Burlington
AOC:	4
Date:	06/18/2019

Weather:

Temperature (°F)	Wind Speed (mph)	Wind Direction	Sky	Precipitation
85	8	N	Sunny	None

Parsons Personnel:	Dan Chamberland, Aaron Sutton, Kylah Wyatt
Contractors:	Cascade (Chris Turner, Jake Smith)
Site Visitors:	None
Safety:	Mind on task as we approach days off. Hydration and sun exposure.
Plans for the Day:	Mob and begin BRLTN04-MW01S/D. Develop BRLTN02-MW01S/D. Sample BRLTNDG-MW01S/D.
General Comments:	
Note:	

PARSONS

DAILY FIELD SUMMARY REPORT

Surface Geophysics for Utility Clearance:

No activity.

Utility Clearance:

No activity.

Water Level Measurements

No activity.

Soil Borings:

No activity.

Shallow or Colocated Wells:

Mob and begin BRLTN04-MW01D. Depth at end of day: 50 ft bgs. 40 gallons of water added.

Deep Wells:

No activity.

Wells Developed:

Develop BRLTN02-MW01S/D complete. Cascade did not support the development of these Wells.

Slug Tests:

No activity.

Surface Water Samples:

No activity.

Sediment Samples:

No activity.

Stormwater Samples:

No activity.

DAILY FIELD SUMMARY REPORT

PARSONS

DAILY FIELD SUMMARY REPORT

Surface Soil Samples:

No activity.

Instrument Survey:

No activity.

IDW Management:

No activity.

Water/Liquid Drums	Soil Drums	PPE/Debris Drums
5	4	

Drums were moved to the following area:

1 drum of soil cuttings from AOC 1 is stored at AOC 1. 3 drums of soil cuttings from AOC 6 are stored at Army Aviation Support Facility. Final disposition will be depending pending analysis. Other soil cuttings spread at FTA-1.

Miscellaneous Notes:

DAILY FIELD SUMMARY REPORT

Site Name:	Burlington
AOC:	4
Date:	06/19/2019

Weather:

Temperature (°F)	Wind Speed (mph)	Wind Direction	Sky	Precipitation
90	10	NE	Sunny	None

Parsons Personnel:	Dan Chamberland, Aaron Sutton, Kylah Wyatt
Contractors:	Cascade (Chris Turner, Jake Smith)
Site Visitors:	None
Safety:	Mind on task before days off. Possibility of thunderstorms.
Plans for the Day:	Sample BRLTN02-MW01S/D. Continue drilling BRLTN04-MW01D. Spread soil (not AOC 1) around laydown yard. Contact landowners adjacent to Base for ROEs. Sample shipping.
General Comments:	
Note:	

PARSONS

DAILY FIELD SUMMARY REPORT

Surface Geophysics for Utility Clearance:

No activity.

Utility Clearance:

No activity.

Water Level Measurements

No activity.

Soil Borings:

No activity.

Shallow or Colocated Wells:

No activity.

Deep Wells:

Continue drilling BRLTN04-MW01D. Advance to 60 ft bgs, case (8") down to 58 ft bgs.
All equipment demobbed to laydown yard for days off.

Wells Developed:

No activity.

Slug Tests:

No activity.

Surface Water Samples:

No activity.

Sediment Samples:

No activity.

Stormwater Samples:

No activity.

DAILY FIELD SUMMARY REPORT

PARSONS

DAILY FIELD SUMMARY REPORT

Surface Soil Samples:

No activity.

Instrument Survey:

No activity.

IDW Management:

No activity.

Water/Liquid Drums	Soil Drums	PPE/Debris Drums
5 totes	4	

Drums were moved to the following area:

1 drum of soil cuttings from AOC 1 is stored at AOC 1. 3 drums of soil cuttings from AOC 6 are stored at Army Aviation Support Facility. Final disposition will be depending pending analysis. Other soil cuttings spread at FTA-1.

Miscellaneous Notes:

DAILY FIELD SUMMARY REPORT

Site Name:	Burlington
AOC:	4
Date:	06/24/2019

Weather:

Temperature (°F)	Wind Speed (mph)	Wind Direction	Sky	Precipitation
80	5	N	Sunny	None

Parsons Personnel:	Dan Chamberland, Kylah Wyatt
Contractors:	Cascade (Chris Turner, Scotty Vermillien)
Site Visitors:	None
Safety:	New personnel on Base. Back from days off - getting back into mindset for activities.
Plans for the Day:	Develop AASF06-MW01S. SAMPLE AASF06-MW02S. Continue to advance BRLTN04-MW01D, possibly set well.
General Comments:	
Note:	

DAILY FIELD SUMMARY REPORT

Surface Geophysics for Utility Clearance:

No activity.

Utility Clearance:

No activity.

Water Level Measurements

No activity.

Soil Borings:

No activity.

Shallow or Colocated Wells:

No activity.

Deep Wells:

Continue to advance BRLTN04-MW01D. TD 75 ft, 150 gallons added in screen interval.

Wells Developed:

Began development AASF06-MW01S. Purged well dry (3.7 gal removed). Water not recharging quickly. Water purged may not have been formation water. Will return tomorrow and check status.

Slug Tests:

No activity.

Surface Water Samples:

No activity.

Sediment Samples:

No activity.

Stormwater Samples:

No activity.

DAILY FIELD SUMMARY REPORT

Surface Soil Samples:

No activity.

Instrument Survey:

No activity.

IDW Management:

Water/Liquid Drums	Soil Drums	PPE/Debris Drums
4 totes (inadvertently reported 5 totes on 6/18 and 6/19)	4	

Drums were moved to the following area:

1 drum of soil cuttings from AOC 1 is stored at AOC 1. 3 drums of soil cuttings from AOC 6 are stored at Army Aviation Support Facility. Final disposition will be depending pending analysis. Other soil cuttings spread at FTA-1.

Miscellaneous Notes:

DAILY FIELD SUMMARY REPORT

Site Name:	Burlington
AOC:	4
Date:	06/25/2019

Weather:

Temperature (°F)	Wind Speed (mph)	Wind Direction	Sky	Precipitation
72	8	NE	Partly Cloudy	Rain

Parsons Personnel:	Kylah Wyatt, Dan Chamberland
Contractors:	Cascade (Chris Turner, Scotty Vermillien)
Site Visitors:	None
Safety:	Public relations
Plans for the Day:	Develop aasf06mw-01s. Install BRLTN04-MW01S/D. Sample AASF06MW-02S.
General Comments:	Sampled well AASF06-MW02S
Note:	

DAILY FIELD SUMMARY REPORT

Surface Geophysics for Utility Clearance:

No activity.

Utility Clearance:

No activity.

Water Level Measurements

No activity.

Soil Borings:

No activity.

Shallow or Colocated Wells:

Install BRLTN04-MW01S to 25 ft, w 10 ft screen.
Install BRLTN04-MW01D to 74.5 ft, w 10 ft screen?

Deep Wells:

No activity.

Wells Developed:

Developed aasf06mw-01s - conducted low flow test. Could not sustain 80 mL/ min. No Cascade support for this. Well.

Slug Tests:

No activity.

Surface Water Samples:

No activity.

Sediment Samples:

No activity.

Stormwater Samples:

No activity.

DAILY FIELD SUMMARY REPORT

Surface Soil Samples:

No activity.

Instrument Survey:

No activity.

IDW Management:

Water/Liquid Drums	Soil Drums	PPE/Debris Drums
Water discharged to ground surface per VTDEC policy	4	

Drums were moved to the following area:

1 drum of soil cuttings from AOC 1 is stored at AOC 1. 3 drums of soil cuttings from AOC 6 are stored at Army Aviation Support Facility. Final disposition will be depending pending analysis. Other soil cuttings spread at FTA-1.

Miscellaneous Notes:

DAILY FIELD SUMMARY REPORT

Site Name: Burlington

AOC: Downgradient

Date: 06/26/2019

Weather:

Temperature (°F)	Wind Speed (mph)	Wind Direction	Sky	Precipitation
85	5	N	Sunny	None

Parsons Personnel: Dan Chamberland, Kylah Wyatt

Contractors:
Cascade (Scotty Villimire, Chris Turner, Lincoln Cohen)
VT Utility locators (Tyler Button)

Site Visitors: Todd and John Belter when on their property

Safety: Communication with collegues. New personnel on site

Plans for the Day:
Utility locates (BRLTNDG-MW02S/D THROUGH -MW05S/D)
Mob and begin drilling BRLTNUP-MW01D
Check water level AASF06-MW01S (DTW: 14.2, TD: 14.83 ft btoc)

General Comments:

Note:

PARSONS

DAILY FIELD SUMMARY REPORT

Surface Geophysics for Utility Clearance:

No activity.

Utility Clearance:

Utility locates (BRLTNDG-MW02S/D THROUGH -MW05S/D)

Water Level Measurements

No activity.

Soil Borings:

No activity.

Shallow or Colocated Wells:

No activity.

Deep Wells:

Mob, drilling, install BRLTNUP-MW01D. TD 58 ft. 10 ft screen.

Wells Developed:

No activity.

Slug Tests:

No activity.

Surface Water Samples:

No activity.

Sediment Samples:

No activity.

Stormwater Samples:

No activity.

DAILY FIELD SUMMARY REPORT

Surface Soil Samples:

No activity.

Instrument Survey:

No activity.

IDW Management:

Water/Liquid Drums	Soil Drums	PPE/Debris Drums
Water discharged to ground surface per VTDEC policy	4	

Drums were moved to the following area:

1 drum of soil cuttings from AOC 1 is stored at AOC 1. 3 drums of soil cuttings from AOC 6 are stored at Army Aviation Support Facility. Final disposition will be depending pending analysis. Other soil cuttings spread at FTA-1.

Miscellaneous Notes:

DAILY FIELD SUMMARY REPORT

Site Name: Burlington

AOC: 4

Date: 06/27/2019

Weather:

Temperature (°F)	Wind Speed (mph)	Wind Direction	Sky	Precipitation
90	5	N	Sunny	None

Parsons Personnel: Dan Chamberland, Kylah Wyatt

Contractors: Cascade (Scotty Villimire, Chris Turner, Lincoln Cohen)

Site Visitors: Eric LaRoche (VT Gas) at off Base clearances.

Safety: Heat exhaustion. Traffic.

Plans for the Day:
Walk drilling locations with Cascade.
Decon drilling equip. Load for mob to Belter property tomortow. AM.
Develop BRLTN04-MW01S/D.
Finish development at AASF06-MW01S.

General Comments:

Note:

PARSONS

DAILY FIELD SUMMARY REPORT

Surface Geophysics for Utility Clearance:

No activity.

Utility Clearance:

Met with VT GAS for off Base clearances. Gas marked at tennis court, near proposed drilling location. No gas anywhere else.

Water Level Measurements

No activity.

Soil Borings:

No activity.

Shallow or Colocated Wells:

No activity.

Deep Wells:

No activity.

Wells Developed:

Finish development at AASF06-MW01S, and BRLTN04-MW01S/D.

Slug Tests:

No activity.

Surface Water Samples:

No activity.

Sediment Samples:

No activity.

Stormwater Samples:

No activity.

DAILY FIELD SUMMARY REPORT

Surface Soil Samples:

No activity.

Instrument Survey:

No activity.

IDW Management:

Water/Liquid Drums	Soil Drums	PPE/Debris Drums
Water discharged to ground surface per VTDEC policy	4	

Drums were moved to the following area:

1 drum of soil cuttings from AOC 1 is stored at AOC 1. 3 drums of soil cuttings from AOC 6 are stored at Army Aviation Support Facility. Final disposition will be depending pending analysis. Other soil cuttings spread at FTA-1.

Miscellaneous Notes:

DAILY FIELD SUMMARY REPORT

Site Name: Burlington

AOC: Downgradient

Date: 06/28/2019

Weather:

Temperature (°F)	Wind Speed (mph)	Wind Direction	Sky	Precipitation
85	10	N	Sunny	None

Parsons Personnel: Dan Chamberland, Kylah Wyatt

Contractors: Cascade (Chris Turner, Scotty Villimire, Lincoln Cohen)

Site Visitors: None

Safety: Heat - take breaks, stay properly hydrated. Stop and check/re-check plans prior to execution of tasks.

Plans for the Day:
Mob and DRILL BRLTNDG-MW02S/D.
DEVELOP BRLTN04-MW01D, continued.
Pay for permit for Wells in Country Club Estates.

General Comments:

Note:

PARSONS

DAILY FIELD SUMMARY REPORT

Surface Geophysics for Utility Clearance:

No activity.

Utility Clearance:

No activity.

Water Level Measurements

No activity.

Soil Borings:

No activity.

Shallow or Colocated Wells:

Installed BRLTNDG-MW02S, no deep pair due to shallow rock.
Installed BRLTNDG-MW04D.

Deep Wells:

No activity.

Wells Developed:

DEVELOP BRLTN04-MW01D, continued (second dry purge).

Slug Tests:

No activity.

Surface Water Samples:

No activity.

Sediment Samples:

No activity.

Stormwater Samples:

No activity.

DAILY FIELD SUMMARY REPORT

Surface Soil Samples:

No activity.

Instrument Survey:

No activity.

IDW Management:

Water/Liquid Drums	Soil Drums	PPE/Debris Drums
Water discharged to ground surface per VTDEC policy	5	

Drums were moved to the following area:

1 drum of soil cuttings from AOC 1 and 1 drum of soil cuttings from Belter property is stored at AOC 1. 3 drums of soil cuttings from AOC 6 are stored at Army Aviation Support Facility. Final disposition will be depending pending analysis. Other soil cuttings spread at FTA-1.

Miscellaneous Notes:

DAILY FIELD SUMMARY REPORT

Site Name: Burlington

AOC: Downgradient

Date: 06/29/2019

Weather:

Temperature (°F)	Wind Speed (mph)	Wind Direction	Sky	Precipitation
78	10	N	Partly Cloudy	None

Parsons Personnel: Dan Chamberland, Kylah Wyatt

Contractors: None

Site Visitors: None

Safety: Traffic - air and roadway.

Plans for the Day:
DEVELOP: BRLTN04-MW01D, BRLTNUP-MW01D.
SAMPLE: BTV-MW-5 (RD2), BRLTN04-MW01S (RD1)
FLIER NEIGHBORHOOD IMPACTED BY DRILLING (12 homes)

General Comments:
Collected groundwater samples BRLTN04-MW01S-01, BTV-MW-5-02,

MW-405-02

Note:

PARSONS

DAILY FIELD SUMMARY REPORT

Surface Geophysics for Utility Clearance:

No activity.

Utility Clearance:

No activity.

Water Level Measurements

No activity.

Soil Borings:

No activity.

Shallow or Colocated Wells:

No activity.

Deep Wells:

No activity.

Wells Developed:

BRLTN04-MW01D not recovered to 80%,
BRLTNUP-MW01D developed completely (3x drill water, 3xWV) - no Cascade support for this well

Slug Tests:

No activity.

Surface Water Samples:

No activity.

Sediment Samples:

No activity.

Stormwater Samples:

No activity.

DAILY FIELD SUMMARY REPORT

Surface Soil Samples:

No activity.

Instrument Survey:

No activity.

IDW Management:

No activity.

Water/Liquid Drums	Soil Drums	PPE/Debris Drums
Water discharged to ground surface per VTDEC policy	5	

Drums were moved to the following area:

1 drum of soil cuttings from AOC 1 and 1 drum of soil cuttings from off-site wells is stored at AOC 1. 3 drums of soil cuttings from AOC 6 are stored at Army Aviation Support Facility. Final disposition will be depending pending analysis. Other soil cuttings spread at FTA-1.

Miscellaneous Notes:

DAILY FIELD SUMMARY REPORT

Site Name: Burlington

AOC: Downgradient

Date: 06/30/2019

Weather:

Temperature (°F)	Wind Speed (mph)	Wind Direction	Sky	Precipitation
78	10	N	Partly Cloudy	Rain

Parsons Personnel: Dan Chamberland, Kylah Wyatt

Contractors: Cascade (Chris Turner, Scotty Vermillien - Lincoln Cohen was not allowed on site as a visitor, this was news to all staff)

Site Visitors: None

Safety: Electrical storms - 30/30 rule

Plans for the Day: Drilling: decon, set pad on BRLTNDG-MW04S/D
GW SAMPLE: ROUND 2

General Comments: Collected groundwater samples MW-105-02, V1-MW-107-02, V1-MW14-02, MW-401-02, MW-403-02, V4-MW413-02, V4-MW-5-02, and Well 59-02

Note:

DAILY FIELD SUMMARY REPORT

Surface Geophysics for Utility Clearance:

No activity.

Utility Clearance:

No activity.

Water Level Measurements

No activity.

Soil Borings:

No activity.

Shallow or Colocated Wells:

set pad on BRLTNDG-MW04S/D. Due to rain event did not set pad on BRLTNDG-MW02S

Deep Wells:

No activity.

Wells Developed:

No activity.

Slug Tests:

No activity.

Surface Water Samples:

No activity.

Sediment Samples:

No activity.

Stormwater Samples:

No activity.

DAILY FIELD SUMMARY REPORT

Surface Soil Samples:

No activity.

Instrument Survey:

No activity.

IDW Management:

No activity.

Water/Liquid Drums	Soil Drums	PPE/Debris Drums
Water discharged to ground surface per VTDEC policy	5	

Drums were moved to the following area:

1 drum of soil cuttings from AOC 1 and 1 drum of soil cuttings from off-site wells is stored at AOC 1. 3 drums of soil cuttings from AOC 6 are stored at Army Aviation Support Facility. Final disposition will be depending pending analysis. Other soil cuttings spread at FTA-1.

Miscellaneous Notes:

DAILY FIELD SUMMARY REPORT

Site Name: Burlington

AOC: Downgradient

Date: 07/01/2019

Weather:

Temperature (°F)	Wind Speed (mph)	Wind Direction	Sky	Precipitation
85	10	N	Sunny	None

Parsons Personnel: Dan Chamberland, Kylah Wyatt

Contractors: Cascade (Chris Turner, Scotty Vermillien, Lincoln Cohen)

Site Visitors: Power and water utilities

Safety: Don gloves even or small tasks

Plans for the Day:

Develop: BRLTNDG-MW04S/D

Drill: BRLTNDG-MW03S/D (tennis court)

Sample: AASF06-MW01S

General Comments: Collected groundwater sample AASF06-MW01S-01

Note:

DAILY FIELD SUMMARY REPORT

Surface Geophysics for Utility Clearance:

No activity.

Utility Clearance:

Power and water arrived after failing to demarcate Country Club Estates drill locations

Water Level Measurements

No activity.

Soil Borings:

No activity.

Shallow or Colocated Wells:

Drill: BRLTNDG-MW03S/D (tennis court). Deep well needs grout, shallow not yet installed

Deep Wells:

No activity.

Wells Developed:

Develop: BRLTNDG-MW04S and 4D, complete

Slug Tests:

No activity.

Surface Water Samples:

No activity.

Sediment Samples:

No activity.

Stormwater Samples:

No activity.

DAILY FIELD SUMMARY REPORT

Surface Soil Samples:

No activity.

Instrument Survey:

No activity.

IDW Management:

No activity.

Water/Liquid Drums	Soil Drums	PPE/Debris Drums
Water discharged to ground surface per VTDEC policy	6	

Drums were moved to the following area:

1 drum of soil cuttings from AOC 1 and 2 drums of soil cuttings from off-site wells is stored at AOC 1. 3 drums of soil cuttings from AOC 6 are stored at Army Aviation Support Facility. Final disposition will be depending pending analysis. Other soil cuttings spread at FTA-1.

Miscellaneous Notes:

DAILY FIELD SUMMARY REPORT

Site Name: Burlington

AOC: Downgradient

Date: 07/02/2019

Weather:

Temperature (°F)	Wind Speed (mph)	Wind Direction	Sky	Precipitation
92	10	N	Sunny	None

Parsons Personnel: Dan Chamberland, Kylah Wyatt

Contractors:
Cascade (Chris Turner, Scotty Vermillien, Lincoln Cohen)
Vermont locators (Tyler Button)
Plastic pipe fabrication (Clint Sutton) - video

Site Visitors: UISC locators

Safety: Working near roadway and public

Plans for the Day: Drill: BRLTNDG-MW03S (tennis court), BRLTNDG-MW05S/D (cul de sac)

Sewer scoping.

General Comments:

Note:

PARSONS

DAILY FIELD SUMMARY REPORT

Surface Geophysics for Utility Clearance:

No activity.

Utility Clearance:

No activity.

Water Level Measurements

No activity.

Soil Borings:

No activity.

Shallow or Colocated Wells:

Finish install and pads on BRLTNDG-MW03S/D (tennis court), BRLTNDG-MW05S/D (cul de sac).

Deep Wells:

No activity.

Wells Developed:

No activity.

Slug Tests:

No activity.

Surface Water Samples:

No activity.

Sediment Samples:

No activity.

Stormwater Samples:

No activity.

DAILY FIELD SUMMARY REPORT

Surface Soil Samples:

No activity.

Instrument Survey:

No activity.

IDW Management:

No activity.

Water/Liquid Drums	Soil Drums	PPE/Debris Drums
Water discharged to ground surface per VTDEC policy	7	

Drums were moved to the following area:

1 drum of soil cuttings from AOC 1 and 3 drums of soil cuttings from off-site wells is stored at AOC 1. 3 drums of soil cuttings from AOC 6 are stored at Army Aviation Support Facility. Final disposition will be depending pending analysis. Other soil cuttings spread at FTA-1.

Miscellaneous Notes:

DAILY FIELD SUMMARY REPORT

Site Name: Burlington

AOC: Downgradient

Date: 07/03/2019

Weather:

Temperature (°F)	Wind Speed (mph)	Wind Direction	Sky	Precipitation
92	10	N	Sunny	None

Parsons Personnel: Dan Chamberland, Kylah Wyatt

Contractors: None

Site Visitors: None

Safety: Heat. Fatigue. working near water.

Plans for the Day: Contingency surface water sampling (see Field Recon Form for sampling records, SW form crashes).

General Comments:

Note:

PARSONS

DAILY FIELD SUMMARY REPORT

Surface Geophysics for Utility Clearance:

No activity.

Utility Clearance:

No activity.

Water Level Measurements

No activity.

Soil Borings:

No activity.

Shallow or Colocated Wells:

No activity.

Deep Wells:

No activity.

Wells Developed:

No activity.

Slug Tests:

No activity.

Surface Water Samples:

Contingency surface water sampling (see Field Recon Form for sampling records, SW form crashes). 7 LOCATIONS: BRLTNDG-016,-017,-018,-023-SW , AND BRLTNUP-002,-003,-005-SW **Samples were received at lab with elevated temperature. Will be recollected.**

Sediment Samples:

No activity.

Stormwater Samples:

No activity.

DAILY FIELD SUMMARY REPORT

Surface Soil Samples:

No activity.

Instrument Survey:

No activity.

IDW Management:

Water/Liquid Drums	Soil Drums	PPE/Debris Drums
Water discharged to ground surface per VTDEC policy	7	

Drums were moved to the following area:

1 drum of soil cuttings from AOC 1 and 3 drums of soil cuttings from off-site wells is stored at AOC 1. 3 drums of soil cuttings from AOC 6 are stored at Army Aviation Support Facility. Final disposition will be depending pending analysis. Other soil cuttings spread at FTA-1.

Miscellaneous Notes:

DAILY FIELD SUMMARY REPORT

Site Name: Burlington

AOC: Downgradient

Date: 07/08/2019

Weather:

Temperature (°F)	Wind Speed (mph)	Wind Direction	Sky	Precipitation
89	10	N	Sunny	None

Parsons Personnel: Dan Chamberland, Kylah Wyatt, Jessica click

Contractors: None

Site Visitors: None

Safety: Traffic. working near water. New personnel on Base.

Plans for the Day: Contingency surface water (re)sampling (see Field Recon Form for sampling records, SW form crashes).
IDW soil (re)sampling.
GW sampling.
Well development.

General Comments: Groundwater sample collected from BRLTNDG-MW04S

Note:

PARSONS

DAILY FIELD SUMMARY REPORT

Surface Geophysics for Utility Clearance:

No activity.

Utility Clearance:

No activity.

Water Level Measurements

No activity.

Soil Borings:

No activity.

Shallow or Colocated Wells:

No activity.

Deep Wells:

No activity.

Wells Developed:

BRLTNDG-MW05S (COMPLETE). IN PROGRESS: BRLTNDG-MW02S, 03S/D, 05D

Slug Tests:

No activity.

Surface Water Samples:

Contingency surface water sampling (see Field Recon Form for sampling records, SW form crashes). 7 LOCATIONS: BRLTNDG-016,-017,-018,-023-SW , AND BRLTNUP-002,-003,-005-SW

Sediment Samples:

No activity.

Stormwater Samples:

No activity.

DAILY FIELD SUMMARY REPORT

Surface Soil Samples:

No activity.

Instrument Survey:

No activity.

IDW Management:

No activity.

Water/Liquid Drums	Soil Drums	PPE/Debris Drums

Drums were moved to the following area:

Miscellaneous Notes:

DAILY FIELD SUMMARY REPORT

Site Name: Burlington

AOC: Downgradient

Date: 07/09/2019

Weather:

Temperature (°F)	Wind Speed (mph)	Wind Direction	Sky	Precipitation
89	10	N	Sunny	None

Parsons Personnel: Dan Chamberland, Aaron Sutton, Kylah Wyatt, Jessica click

Contractors: Cascade (Scotty Vermillien, Chris Turner)
WillScott (Emerson gelson) trailer inspection

Site Visitors: None

Safety: Traffic. working near water. New personnel on Base.

Plans for the Day: Contingency surface water (re)sampling (see Field Recon Form for sampling records, SW form crashes).
GW sampling.
Well development.

General Comments: Groundwater samples collected from BRLTNDG-MW04D and BRLTNDG-MW05S

Note:

PARSONS

DAILY FIELD SUMMARY REPORT

Surface Geophysics for Utility Clearance:

No activity.

Utility Clearance:

No activity.

Water Level Measurements

No activity.

Soil Borings:

No activity.

Shallow or Colocated Wells:

No activity.

Deep Wells:

No activity.

Wells Developed:

IN PROGRESS: BRLTNDG-MW02S, 03S/D, 05D

Slug Tests:

No activity.

Surface Water Samples:

Contingency surface water sampling (see Field Recon Form for sampling records, SW form crashes). 7 LOCATIONS: BRLTNDG-015,-019,-020,-021,-022-SW

Sediment Samples:

No activity.

Stormwater Samples:

No activity.

DAILY FIELD SUMMARY REPORT

Surface Soil Samples:

No activity.

Instrument Survey:

No activity.

IDW Management:

No activity.

Water/Liquid Drums	Soil Drums	PPE/Debris Drums

Drums were moved to the following area:

Miscellaneous Notes:

DAILY FIELD SUMMARY REPORT

Site Name: Burlington

AOC: 4

Date: 07/10/2019

Weather:

Temperature (°F)	Wind Speed (mph)	Wind Direction	Sky	Precipitation
80	5	NE	Sunny	None

Parsons Personnel: Dan Chamberland, Aaron Sutton, Kylah Wyatt, Jessica Click

Contractors: Cascade

Site Visitors: None

Safety: All Parsons personnel attended the safety meeting, cascade showed up to site later on to demob. Splash hazards, ergonomics and respiratory issues

Plans for the Day: GW sampling, well development, supply runs.

General Comments:

Note:

PARSONS

DAILY FIELD SUMMARY REPORT

Surface Geophysics for Utility Clearance:

No activity.

Utility Clearance:

No activity.

Water Level Measurements

No activity.

Soil Borings:

No activity.

Shallow or Colocated Wells:

No activity.

Deep Wells:

No activity.

Wells Developed:

BRLTNDG-02S, BRLTNDG-03D were completed. BRLTNDG-05D, BRLTNDG-03S were purged dry for the second of 3 times.

Slug Tests:

No activity.

Surface Water Samples:

No activity.

Sediment Samples:

No activity.

Stormwater Samples:

No activity.

DAILY FIELD SUMMARY REPORT

Surface Soil Samples:

No activity.

Instrument Survey:

No activity.

Groundwater Sampling:

V1-MW1-02, BRLTN03-MW01S-02, BRLTN02-MW01S-02, BRLTN02-MW01D-02, BRLTNUP-MW01D-01, V1-MW12-02, V1-RFW2-02.

IDW Management:

No activity.

Water/Liquid Drums	Soil Drums	PPE/Debris Drums

Drums were moved to the following area:

Miscellaneous Notes:

DAILY FIELD SUMMARY REPORT

Site Name: Burlington

AOC: Downgradient

Date: 07/11/2019

Weather:

Temperature (°F)	Wind Speed (mph)	Wind Direction	Sky	Precipitation
89	10	N	Sunny	None

Parsons Personnel: Dan Chamberland, Aaron Sutton, Kylah Wyatt, Jessica click

Contractors: Summit Surveyors (Larry Young, Nate Yaeger)

Site Visitors: None

Safety: Traffic. working near water. Electrical storms.

Plans for the Day: Compleye conntingency surface water sampling (see Field Recon Form for sampling records, SW form crashes).
GW sampling.
Well development.
Survey Wells.

General Comments:

Note:

PARSONS

DAILY FIELD SUMMARY REPORT

Surface Geophysics for Utility Clearance:

No activity.

Utility Clearance:

No activity.

Water Level Measurements

No activity.

Soil Borings:

No activity.

Shallow or Colocated Wells:

No activity.

Deep Wells:

No activity.

Wells Developed:

Well development complete for all new Wells.

Slug Tests:

No activity.

Surface Water Samples:

Contingency surface water sampling (see Field Recon Form for sampling records, SW form crashes). 2 REMAINING LOCATIONS: BRLTNUP-001 & -004-SW

Sediment Samples:

No activity.

Stormwater Samples:

No activity.

DAILY FIELD SUMMARY REPORT

Surface Soil Samples:

No activity.

Instrument Survey:

Surveyed ground surface, collar, and top of casing for all new Wells, and MW-401 & MW-405.

Groundwater Sampling:

BRLTNDG-MW03D, BRLTN04-MW01D, BTV-MW-9 & -14, V4-BR03, V4-MW414, BRLTNDG-01S,

IDW Management:

No activity.

Water/Liquid Drums	Soil Drums	PPE/Debris Drums

Drums were moved to the following area:

Miscellaneous Notes:

DAILY FIELD SUMMARY REPORT

Site Name: Burlington

AOC: Downgradient

Date: 07/12/2019

Weather:

Temperature (°F)	Wind Speed (mph)	Wind Direction	Sky	Precipitation
81	10	N	Sunny	Rain

Parsons Personnel: Dan Chamberland, Aaron Sutton, Kylah Wyatt, Jessica click

Contractors: None

Site Visitors: None

Safety: Overnight storm causing slippery condition.

Plans for the Day:
Stormwater if sufficient water present.
GW sampling.
Slug test prep.

General Comments:

Note:

PARSONS

DAILY FIELD SUMMARY REPORT

Surface Geophysics for Utility Clearance:

No activity.

Utility Clearance:

No activity.

Water Level Measurements

No activity.

Soil Borings:

No activity.

Shallow or Colocated Wells:

No activity.

Deep Wells:

No activity.

Wells Developed:

No activity.

Slug Tests:

No activity.

Surface Water Samples:

No activity.

Sediment Samples:

No activity.

Stormwater Samples:

No water accumulation in catchment basins. No samples collected.

DAILY FIELD SUMMARY REPORT

Surface Soil Samples:

No activity.

Instrument Survey:

No activity.

Groundwater Sampling:

BRLTNDG-MW01D, -03S, -04D, -04S, -05D, MW-101, V1-MW-106, BRLTN04-MW01S, AASF06-MW03S

IDW Management:

No activity.

Water/Liquid Drums	Soil Drums	PPE/Debris Drums

Drums were moved to the following area:

Miscellaneous Notes:

DAILY FIELD SUMMARY REPORT

Site Name: Burlington

AOC: Downgradient

Date: 07/13/2019

Weather:

Temperature (°F)	Wind Speed (mph)	Wind Direction	Sky	Precipitation
81	10	SE	Sunny	None

Parsons Personnel: Dan Chamberland, Aaron Sutton, Kylah Wyatt, Jessica click

Contractors: None

Site Visitors: None

Safety: Field project winding down- one off tasks, mind on job/complacency

Plans for the Day:
GW sampling.
Slug testing.
IDW mgmt. AOC 1 seeding.

General Comments: Dan's last day on site.

Note:

PARSONS

DAILY FIELD SUMMARY REPORT

Surface Geophysics for Utility Clearance:

No activity.

Utility Clearance:

No activity.

Water Level Measurements

No activity.

Soil Borings:

No activity.

Shallow or Colocated Wells:

No activity.

Deep Wells:

No activity.

Wells Developed:

No activity.

Slug Tests:

Completed BRLTN03-MW01S AND -MW01D. Shallow tests are approx 5 minutes each, deep tests are 30-45 mins each.

Surface Water Samples:

No activity.

Sediment Samples:

No activity.

Stormwater Samples:

No activity.

DAILY FIELD SUMMARY REPORT

Surface Soil Samples:

No activity.

Instrument Survey:

No activity.

Groundwater Sampling:

BRLTNDG-MW02S, -MW03D, -MW05S, BRLTNUP-MW01D

IDW Management:

Water/Liquid Drums	Soil Drums	PPE/Debris Drums
1	1	

Drums were moved to the following area:

Dumped AASF06 purge water on ground at AOC1. Spread soil 1 drum of soil at AOC1 - contents of drum were AOC 1 soil boring cuttings.

Miscellaneous Notes:

DAILY FIELD SUMMARY REPORT

Site Name: Burlington

AOC: Downgradient

Date: 07/14/2019

Weather:

Temperature (°F)	Wind Speed (mph)	Wind Direction	Sky	Precipitation
81	10	NE	Partly Cloudy	None

Parsons Personnel: Aaron Sutton, Kylah Wyatt, Jessica Click

Contractors: None

Site Visitors: None

Safety: Traffic.

Plans for the Day: Slug testing. Packing rental equipment. Groundwater sampling.

General Comments:

Note:

PARSONS

DAILY FIELD SUMMARY REPORT

Surface Geophysics for Utility Clearance:

No activity.

Utility Clearance:

No activity.

Water Level Measurements

No activity.

Soil Borings:

No activity.

Shallow or Colocated Wells:

No activity.

Deep Wells:

No activity.

Wells Developed:

No activity.

Slug Tests:

BRLTNDG-MW01D, BRLTN02-MW01S&D

Surface Water Samples:

No activity.

Sediment Samples:

No activity.

Stormwater Samples:

No activity.

DAILY FIELD SUMMARY REPORT

Surface Soil Samples:

No activity.

Instrument Survey:

No activity.

Groundwater Sampling:

BRLTNDG-MW03S, -05D and BRLTN04-MW01D

IDW Management:

No activity.

Water/Liquid Drums	Soil Drums	PPE/Debris Drums

Drums were moved to the following area:

Miscellaneous Notes:

DAILY FIELD SUMMARY REPORT

Site Name:	Burlington
AOC:	Downgradient
Date:	07/15/2019

Weather:

Temperature (°F)	Wind Speed (mph)	Wind Direction	Sky	Precipitation
81	10	SE	Sunny	None

Parsons Personnel:	Aaron Sutton, Kylah Wyatt, Jessica click
Contractors:	None
Site Visitors:	None
Safety:	Field project winding down- one off tasks, mind on job/complacency
Plans for the Day:	GW sampling. Slug testing. IDW mgmt. Grass seeding in laydown yard and well pads.
General Comments:	
Note:	

PARSONS

DAILY FIELD SUMMARY REPORT

Surface Geophysics for Utility Clearance:

No activity.

Utility Clearance:

No activity.

Water Level Measurements

No activity.

Soil Borings:

No activity.

Shallow or Colocated Wells:

No activity.

Deep Wells:

No activity.

Wells Developed:

No activity.

Slug Tests:

Completed BRLTN04-MW01S AND AASF06-MWO3S. Shallow tests are approx 5-10 minutes each.

Surface Water Samples:

No activity.

Sediment Samples:

No activity.

Stormwater Samples:

No activity.

DAILY FIELD SUMMARY REPORT

Surface Soil Samples:

No activity.

Instrument Survey:

No activity.

Groundwater Sampling:

Purged AASF06-MW01S and -MW02S dry, will direct sample 7/16/19.

IDW Management:

Water/Liquid Drums	Soil Drums	PPE/Debris Drums
	1	

Drums were moved to the following area:

Collected total VOCs and total SVOCs (grab sample) for IDW characterization (BRLTN-IDW-S02)

Miscellaneous Notes:

PARSONS

DAILY FIELD SUMMARY REPORT

Site Name:	Burlington
AOC:	Downgradient
Date:	07/16/2019

Weather:

Temperature (°F)	Wind Speed (mph)	Wind Direction	Sky	Precipitation
81	10	SE	Sunny	None

Parsons Personnel:	Aaron Sutton, Kylah Wyatt, Jessica click
Contractors:	None
Site Visitors:	None
Safety:	Field project winding down- one off tasks, mind on job/complacency
Plans for the Day:	GW sampling. Slug testing.
General Comments:	
Note:	

PARSONS

DAILY FIELD SUMMARY REPORT

Surface Geophysics for Utility Clearance:

No activity.

Utility Clearance:

No activity.

Water Level Measurements

No activity.

Soil Borings:

No activity.

Shallow or Colocated Wells:

No activity.

Deep Wells:

No activity.

Wells Developed:

No activity.

Slug Tests:

Completed tests at BRLTNDG-MW03S AND -04S.

Surface Water Samples:

No activity.

Sediment Samples:

No activity.

Stormwater Samples:

No activity.

DAILY FIELD SUMMARY REPORT

Surface Soil Samples:

No activity.

Instrument Survey:

No activity.

Groundwater Sampling:

Collected direct samples from AASF06-MW01S and -MW02S. AASF06-MW01S was extremely volume limited (~125ML).

IDW Management:

No activity.

Water/Liquid Drums	Soil Drums	PPE/Debris Drums

Drums were moved to the following area:

Miscellaneous Notes:

DAILY FIELD SUMMARY REPORT

Site Name: Burlington

AOC: Downgradient

Date: 07/17/2019

Weather:

Temperature (°F)	Wind Speed (mph)	Wind Direction	Sky	Precipitation
81	10	SE	Sunny	Rain

Parsons Personnel: Aaron Sutton, Kylah Wyatt, Jessica click

Contractors: None

Site Visitors: Shannon Kelly, Jason Villemaire (VTANG)

Safety: Field project winding down- one off tasks, mind on job/complacency. Wet conditions.

Plans for the Day: Storm water sampling.
Shipping. Site break down.

General Comments: VTANG inspected lay down yard and had no requests for further restoration.

Note: Josh Foy dumped AASF06 soil at Army Aviation Support Facility and returned the empty drums to AOC 1. Labeled empty drums.

DAILY FIELD SUMMARY REPORT

Surface Geophysics for Utility Clearance:

No activity.

Utility Clearance:

No activity.

Water Level Measurements

No activity.

Soil Borings:

No activity.

Shallow or Colocated Wells:

No activity.

Deep Wells:

No activity.

Wells Developed:

No activity.

Slug Tests:

No activity.

Surface Water Samples:

No activity.

Sediment Samples:

No activity.

Stormwater Samples:

Inspected remaining storm water sampling locations. Collected from locations with flowing water: BRLTNDG-003, -004, -006-SW

DAILY FIELD SUMMARY REPORT

Surface Soil Samples:

No activity.

Instrument Survey:

No activity.

Groundwater Sampling:

IDW Management:

No activity.

Water/Liquid Drums	Soil Drums	PPE/Debris Drums

Drums were moved to the following area:

Seven empty drums and nine empty 275-gallon totes are stored at AOC 1 laydown yard, along with 5 drums of soil cuttings from the wells installed off-site. Disposal of the soil drums is pending waste characterization and profiling.

Miscellaneous Notes:

APPENDIX B Soil Boring Logs

Soil Boring Log - Sonic

CLIENT:	Air National Guard	**PARSONS ON-SITE:**	Dan Chamberland	**BORING/WELL #:**	AASF06-MW01S
PROJECT NAME:	ANG ESI	**DRILLING CONTRACTOR:**	Cascade	**LOCATION DESCRIPTION**	
SITE NAME:	Burlington	**RIG TYPE:**	Mini Sonic	**COOR SYSTEM:**	WGS 1984 UTM Zone 18N
AREA OF CONCERN:	6	**MACHINE MODEL #:**	10-01422	**COOR TYPE:**	Surveyed
ADDRESS:	Moved 120 feet NW, 35 feet from the pavement. Directly in line with the culvert.	**DRILLING METHOD:**	Sonic	**NORTHING/LAT.:**	4927032.959
		LICENSED DRILLER:	Larry Turner	**EASTING/LONG.:**	645815.7548
		DRILLING HELPERS:	Jake Smith	**XY COOR. UNIT:**	Meters
		BORE HOLE SIZE:	6 Inch	**ELEVATION:**	298.39
		CORE SAMPLER SIZE:	4 Inch	**Z COOR UNIT:**	Feet
		BORING LOG DATE/TIME:		**DRILLING ORIENTATION:**	
		DATE/TIME START:	06/17/2019 10:20	**BEARING:**	
		DATE/TIME FINISH:	06/17/2019 12:39	**INCLINATION:**	
		SAMPLING EQUIPMENT:		**BORING DETAILS:**	
		DEVICE LENGTH:		**INTERVAL TYPE:**	Discrete
		DEVICE COMMENTS:		**SOIL CLASS SYSTEM:**	Burmeister
		BACKFILL NOTES:	Monitoring well installed	**BORING LOG START DEPTH:**	0 Feet
				BORING LOG END DEPTH:	15 Feet

FIELD METER #1:		**FIELD METER #2:**	
TYPE:	PID	**TYPE:**	Water Level
SERIAL#:	592-919025	**SERIAL#:**	3010-1123
MODEL:	Minirae 3000	**MODEL:**	Solinst model 101
LIMIT:	0 ppm	**LIMIT:**	Ft
H&S:	5 ppm	**H&S:**	Ft
COMMENTS:		**COMMENTS:**	
Calibrated perfectly this morning.			

DEPTH	Feet		**FIELD METER #1**		**FIELD METER #2**				
TOP	**BTM**	**SCREENING INTERVAL**	**ppm**	**H&S**	**Ft**		**USCS Class.**	**SOIL MATRIX DESCRIPTION**	**BORING INTERVAL NOTES**
0	0							Hole cleared by Hand Tools	Hole Clearing Notes: Hand Tools
0	5						SW	Dry, Brown - light, Fine to Medium SAND, And Silt, Little Medium Gravel	
5	6.5	6.5					CL	Damp, Brown CLAY, And Fine to Medium Sand	
6.5	9.5						CL	Moist, Brown CLAY, Little Medium Cobbles	
9.5	10						GM	Dry, White, Coarse BEDROCK	

Soil Boring Log - Sonic

CLIENT:	Air National Guard	**PARSONS ON-SITE:**	Tom Horn	**BORING/WELL #:**	AASF06-MW02S
PROJECT NAME:	ANG ESI	**DRILLING CONTRACTOR:**	Cascade	**LOCATION DESCRIPTION**	
SITE NAME:	Burlington	**RIG TYPE:**	Mini Sonic	**COOR SYSTEM:**	WGS 1984 UTM Zone 18N
AREA OF CONCERN:	6	**MACHINE MODEL #:**	10-01422	**COOR TYPE:**	Surveyed
ADDRESS:	Relocated ~ 200' North of previously proposed location.	**DRILLING METHOD:**	Sonic	**NORTHING/LAT.:**	4927306.296
		LICENSED DRILLER:	Larry Turner	**EASTING/LONG.:**	645918.6795
		DRILLING HELPERS:	Jake Smith; Matt McCormick	**XY COOR. UNIT:**	Meters

FIELD METER #1:		**FIELD METER #2:**					
TYPE:	PID	**TYPE:**	Water Level	**BORE HOLE SIZE:**	6 Inch	**ELEVATION:**	285.28
SERIAL#:	110_014083	**SERIAL#:**	5868	**CORE SAMPLER SIZE:**	4 Inch	**Z COOR UNIT:**	Feet
MODEL:	Mini Rae 2000	**MODEL:**	Geotech	**BORING LOG DATE/TIME:**		**DRILLING ORIENTATION:**	
LIMIT:	0 ppm	**LIMIT:**	Ft	**DATE/TIME START:**	06/01/2019 11:17	**BEARING:**	
H&S:	5 ppm	**H&S:**	Ft	**DATE/TIME FINISH:**	06/01/2019 11:34	**INCLINATION:**	
COMMENTS:		**COMMENTS:**		**SAMPLING EQUIPMENT:**		**BORING DETAILS:**	
PID		100' WL meter		**DEVICE LENGTH:**		**INTERVAL TYPE:**	Discrete
				DEVICE COMMENTS:		**SOIL CLASS SYSTEM:**	Burmeister
				BACKFILL NOTES:	Monitoring well installed	**BORING LOG START DEPTH:**	5 Feet
						BORING LOG END DEPTH:	16 Feet

DEPTH	Feet		**FIELD METER #1**		**FIELD METER #2**				
TOP	**BTM**	**SCREENING INTERVAL**	**ppm**	**H&S**	**Ft**		**USCS Class.**	**SOIL MATRIX DESCRIPTION**	**BORING INTERVAL NOTES**
0	5							Hole cleared by Hand Tools	Hole Clearing Notes: Hand Tools
5	8.5						SP	Moist, Brown - light grayish, Fine to Medium SAND, Some Silt, Little Medium to Coarse Gravel, Trace Clay	
8.5	10						CL	Moist, Brown - light yellowish Clay, Some Silt, Little Fine Sand, Trace Fine Gravel	
10	10.5						CL	Moist, Brown - light yellowish, Fine '-- SAA ---, Some Silt, Little Fine Sand, Trace Fine Gravel	
10.5	14							Wet, Gray - light, Coarse BEDROCK	
14	15							Wet, Gray - light, Coarse BEDROCK	
15	16							Wet, Gray - light, Coarse BEDROCK, And Medium to Coarse Gravel	Till Present

Soil Boring Log - Sonic

CLIENT:	Air National Guard	**PARSONS ON-SITE:**	Tom Horn; Dan Chamberland	**BORING/WELL #:**	AASF06-MW03S
PROJECT NAME:	ANG ESI	**DRILLING CONTRACTOR:**	Cascade	**LOCATION DESCRIPTION**	
SITE NAME:	Burlington	**RIG TYPE:**	Mini Sonic	**COOR SYSTEM:**	WGS 1984 UTM Zone 18N
AREA OF CONCERN:	6	**MACHINE MODEL #:**	10-01422	**COOR TYPE:**	Surveyed
ADDRESS:	Moved east just outside the fence.	**DRILLING METHOD:**	Sonic	**NORTHING/LAT.:**	4927167.049
		LICENSED DRILLER:	Larry Turner	**EASTING/LONG.:**	646029.338
		DRILLING HELPERS:	Jake Smith	**XY COOR. UNIT:**	Meters

FIELD METER #1:		**FIELD METER #2:**		**BORE HOLE SIZE:**	6 Inch	**ELEVATION:**	267.41
TYPE:	PID	**TYPE:**	Water Level	**CORE SAMPLER SIZE:**	4 Inch	**Z COOR UNIT:**	Feet
SERIAL#:	110-014083	**SERIAL#:**	5868	**BORING LOG DATE/TIME:**		**DRILLING ORIENTATION:**	
MODEL:	MiniRae 2000	**MODEL:**	Geotech water level meter	**DATE/TIME START:**	05/31/2019 10:20	**BEARING:**	
LIMIT:	0 ppm	**LIMIT:**	Ft	**DATE/TIME FINISH:**	06/03/2019 07:55	**INCLINATION:**	
H&S:	5 ppm	**H&S:**	Ft	**SAMPLING EQUIPMENT:**		**BORING DETAILS:**	
COMMENTS:		**COMMENTS:**		**DEVICE LENGTH:**		**INTERVAL TYPE:**	Discrete
Calibrated daily				**DEVICE COMMENTS:**		**SOIL CLASS SYSTEM:**	Burmeister
				BACKFILL NOTES:	Monitoring well installed	**BORING LOG START DEPTH:**	5 Feet
						BORING LOG END DEPTH:	16 Feet

DEPTH	Feet		**FIELD METER #1**		**FIELD METER #2**				
TOP	**BTM**	**SCREENING INTERVAL**	**ppm**	**H&S**	**Ft**		**USCS Class.**	**SOIL MATRIX DESCRIPTION**	**BORING INTERVAL NOTES**
0	5							Hole cleared by Hand Tools	Hole Clearing Notes: Hand Tools
5	6.5						SW	Damp, Brown - light yellowish, Fine to Medium SAND, Some Medium Gravel, Little Silt, Trace Clay, Trace organic material.	
6.5	7.5						CL	Wet, Brown - light grayish CLAY, Little Silt, Trace Fine to Medium Gravel	
7.5	8.25						GP	Wet, Brown - light SILT, And Medium to Coarse Cobbles	
8.25	10						SW	Wet, mottled Brown - very dark/Gray - Brownish, Medium SAND, And Medium Gravel, Trace Coarse Cobbles	Till Present
10	14							Wet, Gray - light, Coarse BEDROCK	
14	15							Dry, Gray - light, Coarse BEDROCK	
15	16							Wet, Gray - light, Coarse BEDROCK	

Soil Boring Log - Sonic

CLIENT:	Air National Guard	**PARSONS ON-SITE:**	Tom Horn	**BORING/WELL #:**	BRLTN01-003-SO
PROJECT NAME:	ANG ESI	**DRILLING CONTRACTOR:**	Cascade	**LOCATION DESCRIPTION**	
SITE NAME:	Burlington	**RIG TYPE:**	Mini Sonic	**COOR SYSTEM:**	WGS 1984 UTM Zone 18N
AREA OF CONCERN:	1	**MACHINE MODEL #:**	10-01422	**COOR TYPE:**	Field
ADDRESS:		**DRILLING METHOD:**	Sonic	**NORTHING/LAT.:**	4926611.382
		LICENSED DRILLER:	Larry Turner	**EASTING/LONG.:**	647076.7334
		DRILLING HELPERS:	Jake Smith	**XY COOR. UNIT:**	Meters
FIELD METER #1:		**FIELD METER #2:**		**BORE HOLE SIZE:**	6 Inch	**ELEVATION:**	312.00
TYPE:	PID	**TYPE:**	Water Level	**CORE SAMPLER SIZE:**	4 Inch	**Z COOR UNIT:**	Feet
SERIAL#:		**SERIAL#:**		**BORING LOG DATE/TIME:**		**DRILLING ORIENTATION:**	
MODEL:		**MODEL:**		**DATE/TIME START:**	5/30/2019 10:30	**BEARING:**	
LIMIT:	0 ppm	**LIMIT:**	Ft	**DATE/TIME FINISH:**	5/30/2019 11:30	**INCLINATION:**	
H&S:	5 ppm	**H&S:**	Ft	**SAMPLING EQUIPMENT:**		**BORING DETAILS:**	
COMMENTS:		**COMMENTS:**		**DEVICE LENGTH:**	5 Feet	**INTERVAL TYPE:**	Discrete
				DEVICE COMMENTS:	Sonic core barrel	**SOIL CLASS SYSTEM:**	Burmeister
				BACKFILL NOTES:	Bentonite	**BORING LOG START DEPTH:**	5 Feet
						BORING LOG END DEPTH:	10 Feet

DEPTH	Feet		**FIELD METER #1**		**FIELD METER #2**				
TOP	**BTM**	**SCREENING INTERVAL**	**ppm**	**H&S**	**Ft**		**USCS Class.**	**SOIL MATRIX DESCRIPTION**	**BORING INTERVAL NOTES**
0	5							Hole cleared by Hand Tools	Hole Clearing Notes: Hand Tools
5	10							Dry, Brown - grayish, Fine to Medium SAND, Little Clay, Trace Silt, Little Medium to Coarse Gravel.	Sample BRTLN-003-SO-5.0-5.5 and BRTLN-003-SO-7.0-7.5

Soil Boring Log - Sonic

CLIENT:	Air National Guard	**PARSONS ON-SITE:**	Tom Horn; Dan Chamberland	**BORING/WELL #:**	BRLTN01-004-SO
PROJECT NAME:	ANG ESI	**DRILLING CONTRACTOR:**	Cascade	**LOCATION DESCRIPTION**	
SITE NAME:	Burlington	**RIG TYPE:**	Mini Sonic	**COOR SYSTEM:**	WGS 1984 UTM Zone 18N
AREA OF CONCERN:	1	**MACHINE MODEL #:**	10-01422	**COOR TYPE:**	Field
ADDRESS:		**DRILLING METHOD:**	Sonic	**NORTHING/LAT.:**	4926611.382
		LICENSED DRILLER:	Larry Turner	**EASTING/LONG.:**	647040.3694
		DRILLING HELPERS:	Jake Smith	**XY COOR. UNIT:**	Meters
FIELD METER #1:		**FIELD METER #2:**		**BORE HOLE SIZE:**	6 Inch	**ELEVATION:**	311.14
TYPE:	PID	**TYPE:**	Water Level	**CORE SAMPLER SIZE:**	4 Inch	**Z COOR UNIT:**	Feet
SERIAL#:		**SERIAL#:**		**BORING LOG DATE/TIME:**		**DRILLING ORIENTATION:**	
MODEL:		**MODEL:**		**DATE/TIME START:**	05/30/2019 12:04	**BEARING:**	
LIMIT:	0 ppm	**LIMIT:**	Ft	**DATE/TIME FINISH:**	05/30/2019 13:29	**INCLINATION:**	
H&S:	5 ppm	**H&S:**	Ft	**SAMPLING EQUIPMENT:**		**BORING DETAILS:**	
COMMENTS:		**COMMENTS:**		**DEVICE LENGTH:**	6 Inch	**INTERVAL TYPE:**	Discrete
				DEVICE COMMENTS:	Sonic core barrel	**SOIL CLASS SYSTEM:**	Burmeister
				BACKFILL NOTES:	Bentonite	**BORING LOG START DEPTH:**	5 Feet
						BORING LOG END DEPTH:	10 Feet

DEPTH	Feet		**FIELD METER #1**		**FIELD METER #2**				
TOP	**BTM**	**SCREENING INTERVAL**	**ppm**	**H&S**	**Ft**		**USCS Class.**	**SOIL MATRIX DESCRIPTION**	**BORING INTERVAL NOTES**
0	5							Hole cleared by Hand Tools	Hole Clearing Notes: Hand Tools
5	5.5							Damp, Brown - light, Fine to Medium SAND, Trace Silt	Sample BRTLN-004-SO-5.0-5.5
5.5	7							Damp, Brown - light reddish, Medium to Coarse SAND, Trace Silt	Sample BRTLN-004-SO-6.0-6.5
7	10							Wet, Brown - light reddish, Fine SAND, Trace Silt	

Soil Boring Log - Sonic

CLIENT:	Air National Guard	**PARSONS ON-SITE:**	Tom Horn, Dan Chamberland	**BORING/WELL #:**	BRLTN02-MW01D
PROJECT NAME:	ANG ESI	**DRILLING CONTRACTOR:**	Cascade	**LOCATION DESCRIPTION**	
SITE NAME:	Burlington	**RIG TYPE:**	Mini Sonic	**COOR SYSTEM:**	WGS 1984 UTM Zone 18N
AREA OF CONCERN:	2	**MACHINE MODEL #:**	10-01422	**COOR TYPE:**	Surveyed
ADDRESS:		**DRILLING METHOD:**	Sonic	**NORTHING/LAT.:**	4926342.534
		LICENSED DRILLER:	Larry Turner	**EASTING/LONG.:**	647181.143
		DRILLING HELPERS:	Jake Smith	**XY COOR. UNIT:**	Meters

FIELD METER #1:		**FIELD METER #2:**					
TYPE:	PID	**TYPE:**	Water Level	**BORE HOLE SIZE:**	6 Inch	**ELEVATION:**	325.13
SERIAL#:	PGM7320	**SERIAL#:**	251927	**CORE SAMPLER SIZE:**	4 Inch	**Z COOR UNIT:**	Feet
MODEL:	Mini Rae 3000	**MODEL:**	Solinst 101	**BORING LOG DATE/TIME:**		**DRILLING ORIENTATION:**	
LIMIT:	0 ppm	**LIMIT:**	Ft	**DATE/TIME START:**	06/14/2019 13:17	**BEARING:**	
H&S:	5 ppm	**H&S:**	Ft	**DATE/TIME FINISH:**	06/15/2019 09:22	**INCLINATION:**	
COMMENTS:		**COMMENTS:**		**SAMPLING EQUIPMENT:**		**BORING DETAILS:**	
				DEVICE LENGTH:		**INTERVAL TYPE:**	Discrete
				DEVICE COMMENTS:		**SOIL CLASS SYSTEM:**	Burmeister
				BACKFILL NOTES:	Monitoring well installed	**BORING LOG START DEPTH:**	0 Feet
						BORING LOG END DEPTH:	65 Feet

DEPTH	Feet		**FIELD METER #1**		**FIELD METER #2**				
TOP	**BTM**	**SCREENING INTERVAL**	**ppm**	**H&S**	**Ft**		**USCS Class.**	**SOIL MATRIX DESCRIPTION**	**BORING INTERVAL NOTES**
0	0							Hole cleared by Hand Tools	Hole Clearing Notes: Hand Tools
0	5						SW	Dry, Brown - light, Fine SAND	
5	10						SW	Dry, Brown - light, Fine SAND	
10	15						SW	Dry, Brown - light, Fine SAND	
15	17						SW	Moist, Brown - light, Fine SAND	
17	20						ML	Moist, Brown - light SILT, Little Fine Sand	
20	23						ML	Moist, Brown - light SILT, Trace Fine Sand	
23	25						ML	Wet, Brown - light SILT, Trace Clay and Sand	
25	30						SP	Wet, Brown - light, Fine to Medium SAND, Some Silt, Little Medium Gravel, Trace Clay	Till Present
30	35						ML	Wet, Brown - light olive SILT, Little Fine Sand, Trace Clay	
35	40						ML	Wet, Brown - light olive SILT	
40	45						ML	Wet, Brown - light olive SILT	
45	50						ML	Wet, Brown - light olive SILT	
50	55						ML	Wet, Brown - dark olive SILT	
55	60				23.5		ML	Wet, Gray SILT, And Fine Sand, Trace Clay. ODOR	
60	65						CL	Wet, Gray CLAY, medium soft.	

Soil Boring Log - Sonic

CLIENT:	Air National Guard	**PARSONS ON-SITE:**	Dan Chamberland, Thomas Horn	**BORING/WELL #:**	BRLTN02-MW01S
PROJECT NAME:	ANG ESI	**DRILLING CONTRACTOR:**	Cascade	**LOCATION DESCRIPTION**	
SITE NAME:	Burlington	**RIG TYPE:**	Mini Sonic	**COOR SYSTEM:**	WGS 1984 UTM Zone 18N
AREA OF CONCERN:	2	**MACHINE MODEL #:**	10-01422	**COOR TYPE:**	Surveyed
ADDRESS:	52 feet north of building 90, 30 feet west of sidewalk.	**DRILLING METHOD:**	Sonic	**NORTHING/LAT.:**	4926341.168
		LICENSED DRILLER:	Larry Turner	**EASTING/LONG.:**	647180.2422
		DRILLING HELPERS:	Jake Smith	**XY COOR. UNIT:**	Meters
		BORE HOLE SIZE:	6 Inch	**ELEVATION:**	325.33
		CORE SAMPLER SIZE:	4 Inch	**Z COOR UNIT:**	Feet
		BORING LOG DATE/TIME:		**DRILLING ORIENTATION:**	
		DATE/TIME START:	06/15/2019 13:58	**BEARING:**	
		DATE/TIME FINISH:	06/15/2019 15:33	**INCLINATION:**	
		SAMPLING EQUIPMENT:		**BORING DETAILS:**	
		DEVICE LENGTH:		**INTERVAL TYPE:**	Discrete
		DEVICE COMMENTS:		**SOIL CLASS SYSTEM:**	Burmeister
		BACKFILL NOTES:	Monitoring well installed	**BORING LOG START DEPTH:**	0 Feet
				BORING LOG END DEPTH:	35 Feet

FIELD METER #1:		**FIELD METER #2:**	
TYPE:	PID	**TYPE:**	Water Level
SERIAL#:	592-919025	**SERIAL#:**	3010-1204
MODEL:	Minirae 3000	**MODEL:**	Solinst 101
LIMIT:	0 ppm	**LIMIT:**	Ft
H&S:	5 ppm	**H&S:**	Ft
COMMENTS:		**COMMENTS:**	

DEPTH	Feet		**FIELD METER #1**		**FIELD METER #2**				
TOP	**BTM**	**SCREENING INTERVAL**	**ppm**	**H&S**	**Ft**		**USCS Class.**	**SOIL MATRIX DESCRIPTION**	**BORING INTERVAL NOTES**
0	0							Hole cleared by Hand Tools	Hole Clearing Notes: Hand Tools
0	5						SW	Dry, Brown - light, Fine SAND	
5	10						SW	Dry, Brown - light, Fine SAND	
10	15						SW	Dry, Brown - light, Fine SAND	
15	17						SW	Moist, Brown - light, Fine SAND	
17	20						ML	Moist, Brown - light SILT, Little Fine Sand	
20	23						ML	Moist, Brown - light SILT, Trace Fine Sand	
23	25						ML	Wet, Brown - light SILT, Trace Clay and Sand	
25	30						SP	Wet, Brown - light, Fine to Medium SAND, Some Silt, Little Medium Gravel, Trace	
30	35						ML	Wet, Brown - light olive SILT, Little Fine Sand, Trace Clay	

Soil Boring Log - Sonic

CLIENT:	Air National Guard	**PARSONS ON-SITE:**	Tom Horn	**BORING/WELL #:**	BRLTN03-MW01D
PROJECT NAME:	ANG ESI	**DRILLING CONTRACTOR:**	Cascade	**LOCATION DESCRIPTION**	
SITE NAME:	Burlington	**RIG TYPE:**	Mini Sonic	**COOR SYSTEM:**	WGS 1984 UTM Zone 18N
AREA OF CONCERN:	3	**MACHINE MODEL #:**	10-01422	**COOR TYPE:**	Surveyed
ADDRESS:	Grassy area in front of Fire Station at 40 NCO Drive	**DRILLING METHOD:**	Sonic	**NORTHING/LAT.:**	4926436.159
		LICENSED DRILLER:	Larry Turner	**EASTING/LONG.:**	647080.5402
		DRILLING HELPERS:	Jake Smith; Matt McCormick	**XY COOR. UNIT:**	Meters
		BORE HOLE SIZE:	6 Inch	**ELEVATION:**	323.91
		CORE SAMPLER SIZE:	4 Inch	**Z COOR UNIT:**	Feet
		BORING LOG DATE/TIME:		**DRILLING ORIENTATION:**	
		DATE/TIME START:	06/03/2019 09:06	**BEARING:**	
		DATE/TIME FINISH:	06/04/2019 09:36	**INCLINATION:**	
		SAMPLING EQUIPMENT:		**BORING DETAILS:**	
		DEVICE LENGTH:		**INTERVAL TYPE:**	Discrete
		DEVICE COMMENTS:		**SOIL CLASS SYSTEM:**	Burmeister
		BACKFILL NOTES:	Monitoring well installed	**BORING LOG START DEPTH:**	5 Feet
				BORING LOG END DEPTH:	80 Feet

FIELD METER #1:		**FIELD METER #2:**	
TYPE:	PID	**TYPE:**	Water Level
SERIAL#:	110-014083	**SERIAL#:**	5868
MODEL:	Mini Rae 2000	**MODEL:**	Geotech
LIMIT:	0 ppm	**LIMIT:**	Ft
H&S:	5 ppm	**H&S:**	Ft
COMMENTS:		**COMMENTS:**	

DEPTH	Feet		**FIELD METER #1**		**FIELD METER #2**				
TOP	**BTM**	**SCREENING INTERVAL**	**ppm**	**H&S**	**Ft**		**USCS Class.**	**SOIL MATRIX DESCRIPTION**	**BORING INTERVAL NOTES**
0	5							Hole cleared by Hand Tools	Hole Clearing Notes: Hand Tools
5	10						SP	Dry, Brown - light, Fine to Medium SAND, Trace Silt	
10	15						SP	Moist, Brown - light grayish, Fine SAND, Trace Silt	
15	17						MH	Moist, Brown - light grayish, Fine SAND, Trace Silt	
17	20						MH	Wet, Brown - light olive SILT, Trace Fine Sand	
20	25						MH	Wet, Brown - dark olive SILT	
25	27						MH	Wet, Brown - dark olive SILT	
27	30						MH	Wet, Brown - dark olive SILT	
30	35						MH	Wet, Brown - dark olive SILT	
35	40						MH	Wet, Brown - dark olive SILT	
40	45						MH	Wet, Gray - light olive SILT	
45	50						MH	Wet, Gray - light olive SILT	
50	53						MH	Wet, Gray SILT, Trace Clay	
53	55						CH	Wet, Gray CLAY, Little Silt	
55	60						SP	Wet, Gray CLAY	
60	63						CH	Wet, Gray CLAY	
63	65						CL	Wet, Gray CLAY, Trace Medium Gravel	Till Present
65	70						CH	Wet, Gray CLAY	
70	75						CH	Wet, Gray CLAY, Little Medium Gravel	
75	80						CL	Wet, Gray CLAY, Some Medium to Coarse Gravel and Sand	Till Present

Soil Boring Log - Sonic

CLIENT:	Air National Guard	**PARSONS ON-SITE:**	Tom Horn	**BORING/WELL #:**	BRLTN03-MW01S
PROJECT NAME:	ANG ESI	**DRILLING CONTRACTOR:**	Cascade	**LOCATION DESCRIPTION**	
SITE NAME:	Burlington	**RIG TYPE:**	Mini Sonic	**COOR SYSTEM:**	WGS 1984 UTM Zone 18N
AREA OF CONCERN:	3	**MACHINE MODEL #:**	10-01422	**COOR TYPE:**	Surveyed
ADDRESS:	Adjacent to BRLTN03-MW01D	**DRILLING METHOD:**	Sonic	**NORTHING/LAT.:**	4926434.746
		LICENSED DRILLER:	Larry Turner	**EASTING/LONG.:**	647079.7711
		DRILLING HELPERS:	Jake Smith; Matt McCormick; Bill Lindsey	**XY COOR. UNIT:**	Meters
FIELD METER #1:		**FIELD METER #2:**		**BORE HOLE SIZE:**	6 Inch	**ELEVATION:**	323.90
TYPE:	PID	**TYPE:**	Water Level	**CORE SAMPLER SIZE:**	4 Inch	**Z COOR UNIT:**	Feet
SERIAL#:	110-014083	**SERIAL#:**	5868	**BORING LOG DATE/TIME:**		**DRILLING ORIENTATION:**	
MODEL:	Mini Rae 2000	**MODEL:**	Geotech	**DATE/TIME START:**	06/05/2019 13:04	**BEARING:**	
LIMIT:	0 ppm	**LIMIT:**	Ft	**DATE/TIME FINISH:**	06/05/2019 14:48	**INCLINATION:**	
H&S:	5 ppm	**H&S:**	Ft	**SAMPLING EQUIPMENT:**		**BORING DETAILS:**	
COMMENTS:		**COMMENTS:**		**DEVICE LENGTH:**		**INTERVAL TYPE:**	Discrete
				DEVICE COMMENTS:		**SOIL CLASS SYSTEM:**	Burmeister
				BACKFILL NOTES:	Monitoring well installed	**BORING LOG START DEPTH:**	5 Feet
						BORING LOG END DEPTH:	25 Feet

DEPTH	Feet		**FIELD METER #1**		**FIELD METER #2**				
TOP	**BTM**	**SCREENING INTERVAL**	**ppm**	**H&S**	**Ft**		**USCS Class.**	**SOIL MATRIX DESCRIPTION**	**BORING INTERVAL NOTES**
0	5							Hole cleared by Hand Tools	Hole Clearing Notes: Hand Tools
5	9						SP	Dry, Brown - dark yellowish, Fine to Medium SAND	
9	10						SP	Dry, Brown - dark, Fine SAND, Trace Silt and Gravel	
10	11						SW	Dry, Brown - dark, Fine SAND, Trace Silt, Little Fine to Medium Gravel	
11	13						SP	Dry, Brown - light grayish, Fine SAND, Trace Silt	
13	15						SW	Moist, Brown - light reddish, Fine SAND, Trace Silt	
15	17						SP	Moist, Brown - dark reddish, Fine SAND, Trace Silt	
17	20						MH	Wet, Brown - light olive SILT, Trace Fine Sand	
20	25						MH	Wet, Brown - light olive SILT	

Soil Boring Log - Sonic

CLIENT:	Air National Guard	**PARSONS ON-SITE:**	Dan Chamberland	**BORING/WELL #:**	BRLTN04-MW01D
PROJECT NAME:	ANG ESI	**DRILLING CONTRACTOR:**	Cascade	**LOCATION DESCRIPTION**	
SITE NAME:	Burlington	**RIG TYPE:**	Mini Sonic	**COOR SYSTEM:**	WGS 1984 UTM Zone 18N
AREA OF CONCERN:	4	**MACHINE MODEL #:**	10-01422	**COOR TYPE:**	Surveyed
ADDRESS:	None, drilling exactly where the stake was placed.	**DRILLING METHOD:**	Sonic	**NORTHING/LAT.:**	4926259.437
		LICENSED DRILLER:	Larry Turner	**EASTING/LONG.:**	647055.2544
		DRILLING HELPERS:	Jake Smith	**XY COOR. UNIT:**	Meters
		BORE HOLE SIZE:	6 Inch	**ELEVATION:**	324.25
		CORE SAMPLER SIZE:	4 Inch	**Z COOR UNIT:**	Feet
		BORING LOG DATE/TIME:		**DRILLING ORIENTATION:**	
		DATE/TIME START:	06/18/2019 12:04	**BEARING:**	
		DATE/TIME FINISH:	06/24/2019 16:30	**INCLINATION:**	
		SAMPLING EQUIPMENT:		**BORING DETAILS:**	
		DEVICE LENGTH:		**INTERVAL TYPE:**	Discrete
		DEVICE COMMENTS:		**SOIL CLASS SYSTEM:**	Burmeister
		BACKFILL NOTES:	Monitoring well installed	**BORING LOG START DEPTH:**	0 Feet
				BORING LOG END DEPTH:	80 Feet

FIELD METER #1:		**FIELD METER #2:**	
TYPE:	PID	**TYPE:**	Water Level
SERIAL#:	592-919025	**SERIAL#:**	3010-1133
MODEL:	Minirae 3000	**MODEL:**	Solinst model 101
LIMIT:	0 ppm	**LIMIT:**	Ft
H&S:	5 ppm	**H&S:**	Ft
COMMENTS:		**COMMENTS:**	
Calibrated daily			

DEPTH	Feet		**FIELD METER #1**		**FIELD METER #2**				
TOP	**BTM**	**SCREENING INTERVAL**	**ppm**	**H&S**	**Ft**		**USCS Class.**	**SOIL MATRIX DESCRIPTION**	**BORING INTERVAL NOTES**
0	0							Hole cleared by Hand Tools	Hole Clearing Notes: Hand Tools
0	5						SP	Dry, Brown, Fine to Medium SAND, Trace Silt	
5	10						SP	Dry, Brown - Pale, Fine to Medium SAND, Trace Fine Gravel	
10	12.2						SP	Damp, Brown - Pale, Fine SAND, Trace Silt	
12.2	12.5						SP	Damp, Brown - dark, Medium to Coarse SAND, Little Fine to Medium Sand	
12.5	15						SP	Damp, Brown, Fine SAND	
15	20						SP	Wet, Brown - light, Fine SAND	
20	25						SP	Wet, Brown - Pale, Fine SAND	
25	30						SP	Wet, Brown, Fine SAND	
30	35						SP	Wet, Brown, Fine SAND	
35	39						SP	Wet, Brown, Fine SAND	
39	40						SP	Wet, Gray, Silty SAND	
40	45						SP	Damp, Gray, Silty SAND, Little Silt	
45	50				14.93		SP	Moist, Gray, Silty SAND, Little Silt	
1	1						SP	Moist, Gray, Silty SAND, Some Silt	
1	1						CL	Moist, Gray CLAY	
1	1						CL	Wet, Gray CLAY	
1	1	66, 69					CL	Wet, Gray CLAY	
1	1						CL	Wet, Gray CLAY	
1	75						ML	Wet, Gray SILT, Little Medium to Coarse Sand and Gravel	Till Present

Soil Boring Log - Sonic

CLIENT:	Air National Guard	**PARSONS ON-SITE:**	Dan Chamberland	**BORING/WELL #:**	BRLTN04-MW01S
PROJECT NAME:	ANG ESI	**DRILLING CONTRACTOR:**	Cascade	**LOCATION DESCRIPTION**	
SITE NAME:	Burlington	**RIG TYPE:**	Mini Sonic	**COOR SYSTEM:**	WGS 1984 UTM Zone 18N
AREA OF CONCERN:	4	**MACHINE MODEL #:**	10-01422	**COOR TYPE:**	Surveyed
ADDRESS:	4 feet to the west of the staked location.	**DRILLING METHOD:**	Sonic	**NORTHING/LAT.:**	4926261.156
		LICENSED DRILLER:	Scotty Vermillon	**EASTING/LONG.:**	647053.5933
		DRILLING HELPERS:	Larry Turner	**XY COOR. UNIT:**	Meters
		BORE HOLE SIZE:	6 Inch	**ELEVATION:**	324.20
		CORE SAMPLER SIZE:	4 Inch	**Z COOR UNIT:**	Feet
		BORING LOG DATE/TIME:		**DRILLING ORIENTATION:**	
		DATE/TIME START:	06/25/2019 12:43	**BEARING:**	
		DATE/TIME FINISH:	06/25/2019 12:42	**INCLINATION:**	
		SAMPLING EQUIPMENT:		**BORING DETAILS:**	
		DEVICE LENGTH:		**INTERVAL TYPE:**	Discrete
		DEVICE COMMENTS:		**SOIL CLASS SYSTEM:**	Burmeister
		BACKFILL NOTES:	Monitoring well installed	**BORING LOG START DEPTH:**	0 Feet
				BORING LOG END DEPTH:	25 Feet

FIELD METER #1:		**FIELD METER #2:**	
TYPE:	PID	**TYPE:**	Water Level
SERIAL#:	592_919025	**SERIAL#:**	3010-1133
MODEL:	Minirae 3000	**MODEL:**	Solinst model 101
LIMIT:	0 ppm	**LIMIT:**	Ft
H&S:	5 ppm	**H&S:**	Ft
COMMENTS:		**COMMENTS:**	
Calibrated daily.			

DEPTH	Feet		**FIELD METER #1**		**FIELD METER #2**				
TOP	**BTM**	**SCREENING INTERVAL**	**ppm**	**H&S**	**Ft**		**USCS Class.**	**SOIL MATRIX DESCRIPTION**	**BORING INTERVAL NOTES**
0	0							Hole cleared by Hand Tools	Hole Clearing Notes: Hand Tools
0	5						SP	Damp, Brown, Medium SAND	
5	10						SP	Damp, Brown, Medium SAND	
10	15						SP	Damp, Brown, Medium SAND	
15	16.5						SP	Moist, Brown, Medium SAND	
16.5	20						SP	Wet, Brown - grayish, Fine SAND	
20	25						SP	Wet, Brown - grayish, Fine SAND	

Soil Boring Log - Sonic

CLIENT:	Air National Guard	**PARSONS ON-SITE:**	Tom Horn	**BORING/WELL #:**	BRLTNDG-MW01D
PROJECT NAME:	ANG ESI	**DRILLING CONTRACTOR:**	Cascade	**LOCATION DESCRIPTION**	
SITE NAME:	Burlington	**RIG TYPE:**	Mini Sonic	**COOR SYSTEM:**	WGS 1984 UTM Zone 18N
AREA OF CONCERN:	Downgradient	**MACHINE MODEL #:**	10-01422	**COOR TYPE:**	Surveyed
ADDRESS:		**DRILLING METHOD:**	Sonic	**NORTHING/LAT.:**	4926929.391
		LICENSED DRILLER:	Larry Turner	**EASTING/LONG.:**	646185.6025
		DRILLING HELPERS:	Jake Smith; Bill Lindsey	**XY COOR. UNIT:**	Meters
		BORE HOLE SIZE:	6 Inch	**ELEVATION:**	284.40
		CORE SAMPLER SIZE:	4 Inch	**Z COOR UNIT:**	Feet
		BORING LOG DATE/TIME:		**DRILLING ORIENTATION:**	
		DATE/TIME START:	06/11/2019 11:03	**BEARING:**	
		DATE/TIME FINISH:	06/13/2019 16:48	**INCLINATION:**	
		SAMPLING EQUIPMENT:		**BORING DETAILS:**	
		DEVICE LENGTH:		**INTERVAL TYPE:**	Discrete
		DEVICE COMMENTS:		**SOIL CLASS SYSTEM:**	Burmeister
		BACKFILL NOTES:	Monitoring well installed	**BORING LOG START DEPTH:**	0 Feet
				BORING LOG END DEPTH:	80 Feet

FIELD METER #1:		**FIELD METER #2:**	
TYPE:	PID	**TYPE:**	Water Level
SERIAL#:	PGM7320	**SERIAL#:**	251927
MODEL:	MiniRae 3000	**MODEL:**	Solinst Water Level Meter
LIMIT:	0 ppm	**LIMIT:**	Ft
H&S:	5 ppm	**H&S:**	Ft
COMMENTS:		**COMMENTS:**	

DEPTH	Feet		**FIELD METER #1**		**FIELD METER #2**				
TOP	**BTM**	**SCREENING INTERVAL**	**ppm**	**H&S**	**Ft**		**USCS Class.**	**SOIL MATRIX DESCRIPTION**	**BORING INTERVAL NOTES**
0	0							Hole cleared by Hand Tools	Hole Clearing Notes: Hand Tools
0	5						SW	Dry, Brown - light, Fine SAND, Trace Fine Gravel	
5	9						SW	Dry, Brown - light, Fine SAND	
9	10						SW	Moist, Brown - light, Fine SAND, Little Silt	
10	15						SW	Moist, Brown - light, Fine SAND, Little Silt	
15	20						SW	Moist, Brown - light, Fine SAND, Little Silt, Trace Fine to Medium Gravel	
20	23						SW	Moist, Brown - light, Fine SAND, Little Silt, Trace Fine Gravel	
23	25						MH	Moist, Brown - light SILT, Little Fine Sand	
25	30						SW	Moist, Brown - light, Fine SAND, Little Silt	
30	33						SW	Moist, Brown - light, Fine SAND, Trace Silt and Gravel	
33	35						SW	Moist, Brown - light, Fine SAND, Little Silt	
35	40						SP	Moist, Brown - light, Fine SAND, Trace Fine to Medium Gravel and Silt	
40	45						SW	Moist, Brown - light, Fine SAND, Some Silt, Trace Fine Gravel	
45	50						SP	Moist, Brown - light, Fine SAND, Little Silt, Trace Fine Gravel and Clay	
50	55						SP	Moist, Brown - light, Fine SAND, Little Silt, Trace Fine Gravel	
55	60						SP	Wet, Brown - dark grayish, Fine to Medium SAND, Little Fine to Medium Gravel and Silt	
60	65						SP	Wet, Brown - grayish, Fine SAND, Trace Medium to Coarse Gravel and Silt	
65	67						SP	Wet, Brown - light, Medium to Coarse SAND, Trace Fine to Medium Gravel and Silt	
67	70						SW	Wet, Brown - light, Fine SAND, Trace Silt	
70	75						SP	Wet, Brown - light, Fine to Medium SAND, Trace Fine to Medium Gravel and Silt	
75	76						SP	Wet, Brown - light grayish, Fine to Medium SAND, Little Silt, Trace Fine Gravel. ODOR	
76	76.5						ML	Wet, mottled Brown - very dark/Gray - light SILT. ODOR	
76.5	77.5						PT	Wet, Brown - light reddish PEAT	
77.5	78						OL	Wet, Brown - dark grayish SILT, Some Clay. ODOR	
78	80						OH	Moist, Gray - dark CLAY, Some Silt. ODOR	

Soil Boring Log - Sonic

CLIENT:	Air National Guard	**PARSONS ON-SITE:**	Tom Horn	**BORING/WELL #:**	BRLTNDG-MW01S
PROJECT NAME:	ANG ESI	**DRILLING CONTRACTOR:**	Cascade	**LOCATION DESCRIPTION**	
SITE NAME:	Burlington	**RIG TYPE:**	Mini Sonic	**COOR SYSTEM:**	WGS 1984 UTM Zone 18N
AREA OF CONCERN:	Downgradient	**MACHINE MODEL #:**	10-01422	**COOR TYPE:**	Surveyed
ADDRESS:	5' north of D	**DRILLING METHOD:**	Sonic	**NORTHING/LAT.:**	4926930.154
		LICENSED DRILLER:	Larry Turner	**EASTING/LONG.:**	646183.0166
		DRILLING HELPERS:	Jake Smith	**XY COOR. UNIT:**	Meters

FIELD METER #1:		**FIELD METER #2:**					
TYPE:	PID	**TYPE:**	Water Level	**BORE HOLE SIZE:**	6 Inch	**ELEVATION:**	284.37
SERIAL#:	PGM7320	**SERIAL#:**	251927	**CORE SAMPLER SIZE:**	4 Inch	**Z COOR UNIT:**	Feet
MODEL:	MiniRae 3000	**MODEL:**	Solinst water level Meter	**BORING LOG DATE/TIME:**		**DRILLING ORIENTATION:**	
LIMIT:	0 ppm	**LIMIT:**	Ft	**DATE/TIME START:**	06/12/2019 15:00	**BEARING:**	
H&S:	5 ppm	**H&S:**	Ft	**DATE/TIME FINISH:**	06/13/2019 14:12	**INCLINATION:**	
COMMENTS:		**COMMENTS:**		**SAMPLING EQUIPMENT:**		**BORING DETAILS:**	
US Environmental rental				**DEVICE LENGTH:**		**INTERVAL TYPE:**	Discrete
				DEVICE COMMENTS:		**SOIL CLASS SYSTEM:**	Burmeister
				BACKFILL NOTES:	Monitoring well installed	**BORING LOG START DEPTH:**	0 Feet
						BORING LOG END DEPTH:	60 Feet

DEPTH	Feet		**FIELD METER #1**		**FIELD METER #2**				
TOP	**BTM**	**SCREENING INTERVAL**	**ppm**	**H&S**	**Ft**		**USCS Class.**	**SOIL MATRIX DESCRIPTION**	**BORING INTERVAL NOTES**
0	0							Hole cleared by Hand Tools	Hole Clearing Notes: Hand Tools
0	5						SW	Dry, Brown - light, Fine SAND, Trace Fine Gravel	
5	9						SW	Dry, Brown - light, Fine SAND	
9	10						SW	Moist, Brown - light, Fine SAND, Little Silt	
10	15						SW	Moist, Brown - light, Fine SAND, Little Silt	
15	20						SW	Moist, Brown - light, Fine SAND, Little Silt, Trace Fine to Medium Gravel	
20	23						SW	Moist, Brown - light, Fine SAND, Little Silt, Trace Fine Gravel	
23	25						MH	Moist, Brown - light SILT, Little Fine Sand	
25	30						SW	Moist, Brown - light, Fine SAND, Little Silt	
30	33						SW	Moist, Brown - light, Fine SAND, Trace Silt and Gravel	
33	35						SW	Moist, Brown - light, Fine SAND, Little Silt	
35	40						SP	Moist, Brown - light, Fine SAND, Trace Fine to Medium Gravel and Silt	
40	45						SW	Moist, Brown - light, Fine SAND, Some Silt, Trace Fine Gravel	
45	50						SP	Moist, Brown - light, Fine SAND, Little Silt, Trace Fine Gravel and Clay	
50	55						SP	Moist, Brown - light, Fine SAND, Little Silt, Trace Fine Gravel	
55	60				52.9		SP	Wet, Brown - dark grayish, Fine to Medium SAND, Little Fine to Medium Gravel and	

Soil Boring Log - Sonic

CLIENT:	Air National Guard	**PARSONS ON-SITE:**	Dan Chamberland	**BORING/WELL #:**	BRLTNDG-MW02S
PROJECT NAME:	ANG ESI	**DRILLING CONTRACTOR:**	Cascade	**LOCATION DESCRIPTION**	
SITE NAME:	Burlington	**RIG TYPE:**	Mini Sonic	**COOR SYSTEM:**	WGS 1984 UTM Zone 18N
AREA OF CONCERN:	Downgradient	**MACHINE MODEL #:**	10-01422	**COOR TYPE:**	Surveyed
ADDRESS:	Just north of power lines	**DRILLING METHOD:**	Sonic	**NORTHING/LAT.:**	4926864.093
		LICENSED DRILLER:	Scotty Vermillon	**EASTING/LONG.:**	646952.3786
		DRILLING HELPERS:	Lincoln Cohen	**XY COOR. UNIT:**	Meters

FIELD METER #1:		**FIELD METER #2:**					
TYPE:	PID	**TYPE:**	Water Level	**BORE HOLE SIZE:**	6 Inch	**ELEVATION:**	286.47
SERIAL#:	592-919025	**SERIAL#:**	3010-1134	**CORE SAMPLER SIZE:**	4 Inch	**Z COOR UNIT:**	Feet
MODEL:	Minirae 3000	**MODEL:**	Solinst model 101	**BORING LOG DATE/TIME:**		**DRILLING ORIENTATION:**	
LIMIT:	0 ppm	**LIMIT:**	Ft	**DATE/TIME START:**	06/28/2019 09:36	**BEARING:**	
H&S:	5 ppm	**H&S:**	Ft	**DATE/TIME FINISH:**	06/28/2019 07:50	**INCLINATION:**	
COMMENTS:		**COMMENTS:**		**SAMPLING EQUIPMENT:**		**BORING DETAILS:**	
Calibrated daily				**DEVICE LENGTH:**		**INTERVAL TYPE:**	Discrete
				DEVICE COMMENTS:		**SOIL CLASS SYSTEM:**	Burmeister
				BACKFILL NOTES:	Monitoring well installed	**BORING LOG START DEPTH:**	0 Feet
						BORING LOG END DEPTH:	15 Feet

DEPTH	Feet		**FIELD METER #1**		**FIELD METER #2**				
TOP	**BTM**	**SCREENING INTERVAL**	**ppm**	**H&S**	**Ft**		**USCS Class.**	**SOIL MATRIX DESCRIPTION**	**BORING INTERVAL NOTES**
0	0							Hole cleared by Hand Tools	Hole Clearing Notes: Hand Tools
0	2.5						SW	Dry, Brown - light grayish, Medium SAND, And Medium Cobbles	
2.5	5						ML	Dry, Brown - light SILT	
5	10						SP	Damp, Gray, Fine SAND, Some Silt	
10	15						SP	Wet, Gray - Brownish, Fine SAND, Some Silt	

Soil Boring Log - Sonic

CLIENT:	Air National Guard	**PARSONS ON-SITE:**	Dan Chamberland	**BORING/WELL #:**	BRLTNDG-MW03D
PROJECT NAME:	ANG ESI	**DRILLING CONTRACTOR:**	Cascade	**LOCATION DESCRIPTION**	
SITE NAME:	Burlington	**RIG TYPE:**	Mini Sonic	**COOR SYSTEM:**	WGS 1984 UTM Zone 18N
AREA OF CONCERN:	Downgradient	**MACHINE MODEL #:**	10-01422	**COOR TYPE:**	Surveyed
ADDRESS:	Near tennis court	**DRILLING METHOD:**	Sonic	**NORTHING/LAT.:**	4926844.975
		LICENSED DRILLER:	Scotty Vermillon	**EASTING/LONG.:**	647070.6335
		DRILLING HELPERS:	Lincoln Cohen	**XY COOR. UNIT:**	Meters
		BORE HOLE SIZE:	6 Inch	**ELEVATION:**	296.56
		CORE SAMPLER SIZE:	4 Inch	**Z COOR UNIT:**	Feet
		BORING LOG DATE/TIME:		**DRILLING ORIENTATION:**	
		DATE/TIME START:	07/01/2019 15:05	**BEARING:**	
		DATE/TIME FINISH:	07/01/2019 17:05	**INCLINATION:**	
		SAMPLING EQUIPMENT:		**BORING DETAILS:**	
		DEVICE LENGTH:		**INTERVAL TYPE:**	Discrete
		DEVICE COMMENTS:		**SOIL CLASS SYSTEM:**	Burmeister
		BACKFILL NOTES:	Monitoring well installed	**BORING LOG START DEPTH:**	0 Feet
				BORING LOG END DEPTH:	33 Feet

FIELD METER #1:		**FIELD METER #2:**	
TYPE:	PID	**TYPE:**	Water Level
SERIAL#:	110-014589	**SERIAL#:**	3010-1204
MODEL:	Minirae 2000	**MODEL:**	Solinst model 101
LIMIT:	0 ppm	**LIMIT:**	Ft
H&S:	5 ppm	**H&S:**	Ft
COMMENTS:		**COMMENTS:**	
Calibrated daily			

DEPTH	Feet		**FIELD METER #1**		**FIELD METER #2**				
TOP	**BTM**	**SCREENING INTERVAL**	**ppm**	**H&S**	**Ft**		**USCS Class.**	**SOIL MATRIX DESCRIPTION**	**BORING INTERVAL NOTES**
0	0							Hole cleared by Hand Tools	Hole Clearing Notes: Hand Tools
0	5						SP	Damp, Brown, Fine SAND, Little Silt	
5	7.8						SP	Wet, Brown, Fine SAND, Little Silt	
7.8	10						CL	Wet, Gray CLAY	
10	15						CL	Wet, Gray - Brownish CLAY, Some Medium Gravel, Trace Coarse Sand	
15	20						GC	Wet, Gray CLAY, And Medium Gravel, Trace Medium Cobbles	
20	21.5						SM	Dry, Gray SILT, Some Coarse Sand, Trace Medium Gravel	
21.5	25						GM	Dry, Gray - Brownish SILT, And Medium Sand, Trace Coarse Gravel and Cobbles	
25	30						SW	Damp, Brown - grayish, Fine to Medium Sand and Gravel, Trace Silt	
30	33						SW	Damp, Brown, Fine SAND, Some Medium Gravel, Trace Silt	
33	33							BEDROCK	

Soil Boring Log - Sonic

CLIENT:	Air National Guard	**PARSONS ON-SITE:**	Kylah Wyatt	**BORING/WELL #:**	BRLTNDG-MW03S
PROJECT NAME:	ANG ESI	**DRILLING CONTRACTOR:**	Cascade	**LOCATION DESCRIPTION**	
SITE NAME:	Burlington	**RIG TYPE:**	Mini Sonic	**COOR SYSTEM:**	WGS 1984 UTM Zone 18N
AREA OF CONCERN:	Downgradient	**MACHINE MODEL #:**	10-01422	**COOR TYPE:**	Surveyed
ADDRESS:	Near tennis court enclosure.	**DRILLING METHOD:**	Sonic	**NORTHING/LAT.:**	4926846.969
		LICENSED DRILLER:	Scotty Vermillon	**EASTING/LONG.:**	647072.3615
		DRILLING HELPERS:	Lincoln Cohen, Chris Turner	**XY COOR. UNIT:**	Meters
		BORE HOLE SIZE:	6 Inch	**ELEVATION:**	296.60
		CORE SAMPLER SIZE:	4 Inch	**Z COOR UNIT:**	Feet
		BORING LOG DATE/TIME:		**DRILLING ORIENTATION:**	
		DATE/TIME START:	07/02/2019 10:18	**BEARING:**	
		DATE/TIME FINISH:	07/03/2019 15:35	**INCLINATION:**	
		SAMPLING EQUIPMENT:		**BORING DETAILS:**	
		DEVICE LENGTH:		**INTERVAL TYPE:**	Discrete
		DEVICE COMMENTS:		**SOIL CLASS SYSTEM:**	Burmeister
		BACKFILL NOTES:	Monitoring well installed	**BORING LOG START DEPTH:**	0 Feet
				BORING LOG END DEPTH:	12 Feet

FIELD METER #1:		**FIELD METER #2:**	
TYPE:	PID	**TYPE:**	Water Level
SERIAL#:	592-919025	**SERIAL#:**	3010-1133
MODEL:	Mini rae 3000	**MODEL:**	Solinst model 101
LIMIT:	0 ppm	**LIMIT:**	Ft
H&S:	5 ppm	**H&S:**	Ft
COMMENTS:		**COMMENTS:**	
Calibrated daily.			

DEPTH	Feet		**FIELD METER #1**		**FIELD METER #2**				
TOP	**BTM**	**SCREENING INTERVAL**	**ppm**	**H&S**	**Ft**		**USCS Class.**	**SOIL MATRIX DESCRIPTION**	**BORING INTERVAL NOTES**
0	0							Hole cleared by Hand Tools	Hole Clearing Notes: Hand Tools
0	4.5						SP	Damp, Brown - light, Medium to Coarse SAND	
4.5	5				4.5		CL	Moist, Brown - dark CLAY	
5	10						CL	Wet, Brown - dark CLAY	
10	12						CL	Wet, Brown - dark, Fine '-- SAA ---	
12	12							BEDROCK	

Soil Boring Log - Sonic

CLIENT:	Air National Guard	**PARSONS ON-SITE:**	Dan Chamberland	**BORING/WELL #:**	BRLTNDG-MW-04D
PROJECT NAME:	ANG ESI	**DRILLING CONTRACTOR:**	Cascade	**LOCATION DESCRIPTION**	
SITE NAME:	Burlington	**RIG TYPE:**	Mini Sonic	**COOR SYSTEM:**	WGS 1984 UTM Zone 18N
AREA OF CONCERN:	Downgradient	**MACHINE MODEL #:**	10-01422	**COOR TYPE:**	Surveyed
ADDRESS:	Next to the large feed pile and new barn location.	**DRILLING METHOD:**	Sonic	**NORTHING/LAT.:**	4927011.115
		LICENSED DRILLER:	Scotty Vermillon	**EASTING/LONG.:**	646918.1413
		DRILLING HELPERS:	Lincoln Cohen	**XY COOR. UNIT:**	Meters
		BORE HOLE SIZE:	6 Inch	**ELEVATION:**	222.32
		CORE SAMPLER SIZE:	4 Inch	**Z COOR UNIT:**	Feet
		BORING LOG DATE/TIME:		**DRILLING ORIENTATION:**	
		DATE/TIME START:	06/28/2019 13:39	**BEARING:**	
		DATE/TIME FINISH:	06/28/2019 13:34	**INCLINATION:**	
		SAMPLING EQUIPMENT:		**BORING DETAILS:**	
		DEVICE LENGTH:		**INTERVAL TYPE:**	Discrete
		DEVICE COMMENTS:		**SOIL CLASS SYSTEM:**	Burmeister
		BACKFILL NOTES:	Monitoring well installed	**BORING LOG START DEPTH:**	0 Feet
				BORING LOG END DEPTH:	24 Feet

FIELD METER #1:		**FIELD METER #2:**	
TYPE:	PID	**TYPE:**	Water Level
SERIAL#:	592-919025	**SERIAL#:**	3010-1133
MODEL:	Minirae 3000	**MODEL:**	Solinst model 101
LIMIT:	0 ppm	**LIMIT:**	Ft
H&S:	5 ppm	**H&S:**	Ft
COMMENTS:		**COMMENTS:**	
Calibrated daily			

DEPTH	Feet		**FIELD METER #1**		**FIELD METER #2**				
TOP	**BTM**	**SCREENING INTERVAL**	**ppm**	**H&S**	**Ft**		**USCS Class.**	**SOIL MATRIX DESCRIPTION**	**BORING INTERVAL NOTES**
0	0							Hole cleared by Hand Tools	Hole Clearing Notes: Hand Tools
0	2						ML	Damp, Brown - very dark SILT, Little Medium to Coarse Sand	
2	5						OL	Moist, Brown - very dark CLAY. ODOR	
5	10						OL	Wet, Black CLAY, Some Fine to Medium Sand	
10	15						PT	Wet, mottled Brown - dark/Gray CLAY. ODOR	
15	20						MH	Wet, Gray - Brownish SILT, Trace Fine Sand. ODOR	
20	21.5						ML	Wet, Gray - Brownish SILT. ODOR	
21.5	24						GW	Wet, mottled Brown - light/Gray - light, Medium GRAVEL, And Medium Sand	

Soil Boring Log - Sonic

CLIENT:	Air National Guard	**PARSONS ON-SITE:**	Dan Chamberland	**BORING/WELL #:**	BRLTNDG-MW04S
PROJECT NAME:	ANG ESI	**DRILLING CONTRACTOR:**	Cascade	**LOCATION DESCRIPTION**	
SITE NAME:	Burlington	**RIG TYPE:**	Mini Sonic	**COOR SYSTEM:**	WGS 1984 UTM Zone 18N
AREA OF CONCERN:	Downgradient	**MACHINE MODEL #:**	10-01422	**COOR TYPE:**	Surveyed
ADDRESS:	As staked, near the feed pile.	**DRILLING METHOD:**	Sonic	**NORTHING/LAT.:**	4927011.867
		LICENSED DRILLER:	Scotty Vermillon	**EASTING/LONG.:**	646919.5166
		DRILLING HELPERS:	Larry Turner; Lincoln Cohen	**XY COOR. UNIT:**	Meters
		BORE HOLE SIZE:	6 Inch	**ELEVATION:**	222.46
		CORE SAMPLER SIZE:	4 Inch	**Z COOR UNIT:**	Feet
		BORING LOG DATE/TIME:		**DRILLING ORIENTATION:**	
		DATE/TIME START:	06/28/2019 16:21	**BEARING:**	
		DATE/TIME FINISH:	06/28/2019 16:21	**INCLINATION:**	
		SAMPLING EQUIPMENT:		**BORING DETAILS:**	
		DEVICE LENGTH:		**INTERVAL TYPE:**	Discrete
		DEVICE COMMENTS:		**SOIL CLASS SYSTEM:**	Burmeister
		BACKFILL NOTES:	Monitoring well installed	**BORING LOG START DEPTH:**	0 Feet
				BORING LOG END DEPTH:	15 Feet

FIELD METER #1:		**FIELD METER #2:**	
TYPE:	PID	**TYPE:**	Water Level
SERIAL#:	592-919025	**SERIAL#:**	3010-1133
MODEL:	Minirae 3000	**MODEL:**	Solinst model 101
LIMIT:	0 ppm	**LIMIT:**	Ft
H&S:	5 ppm	**H&S:**	Ft
COMMENTS:		**COMMENTS:**	
Calibrated daily			

DEPTH	Feet		**FIELD METER #1**		**FIELD METER #2**				
TOP	**BTM**	**SCREENING INTERVAL**	**ppm**	**H&S**	**Ft**		**USCS Class.**	**SOIL MATRIX DESCRIPTION**	**BORING INTERVAL NOTES**
0	0							Hole cleared by Hand Tools	Hole Clearing Notes: Hand Tools
0	5						CL	Moist, Gray - very dark, Fine '-- SAA ---	
5	10						CL	Wet, Brown - very dark, Fine '- - SAA ---. ODOR	
10	15						CL	Wet, Brown - dark, Fine '-- SAA ---	

Soil Boring Log - Sonic

CLIENT:	Air National Guard	**PARSONS ON-SITE:**	Kylah Wyatt	**BORING/WELL #:**	BRLTNDG-MW05D
PROJECT NAME:	ANG ESI	**DRILLING CONTRACTOR:**	Cascade	**LOCATION DESCRIPTION**	
SITE NAME:	Burlington	**RIG TYPE:**	Mini Sonic	**COOR SYSTEM:**	WGS 1984 UTM Zone 18N
AREA OF CONCERN:	Downgradient	**MACHINE MODEL #:**	10-01422	**COOR TYPE:**	Surveyed
ADDRESS:		**DRILLING METHOD:**	Sonic	**NORTHING/LAT.:**	4927039.637
		LICENSED DRILLER:	Scotty Vermillon	**EASTING/LONG.:**	647380.9239
		DRILLING HELPERS:	Larry Turner	**XY COOR. UNIT:**	Meters
		BORE HOLE SIZE:	6 Inch	**ELEVATION:**	247.65
		CORE SAMPLER SIZE:	4 Inch	**Z COOR UNIT:**	Feet
		BORING LOG DATE/TIME:		**DRILLING ORIENTATION:**	
		DATE/TIME START:	07/02/2019 12:20	**BEARING:**	
		DATE/TIME FINISH:	07/02/2019 13:35	**INCLINATION:**	
		SAMPLING EQUIPMENT:		**BORING DETAILS:**	
		DEVICE LENGTH:		**INTERVAL TYPE:**	Discrete
		DEVICE COMMENTS:		**SOIL CLASS SYSTEM:**	Burmeister
		BACKFILL NOTES:	Monitoring well installed	**BORING LOG START DEPTH:**	0 Feet
				BORING LOG END DEPTH:	36 Feet

FIELD METER #1:	
TYPE:	PID
SERIAL#:	592-919025
MODEL:	Mini rae 3000
LIMIT:	0 ppm
H&S:	5 ppm
COMMENTS:	
Calibrated daily	

FIELD METER #2:	
TYPE:	Water Level
SERIAL#:	3010-1133
MODEL:	Solinst model 101
LIMIT:	Ft
H&S:	Ft
COMMENTS:	

DEPTH	Feet		**FIELD METER #1**		**FIELD METER #2**				
TOP	**BTM**	**SCREENING INTERVAL**	**ppm**	**H&S**	**Ft**		**USCS Class.**	**SOIL MATRIX DESCRIPTION**	**BORING INTERVAL NOTES**
0	0							Hole cleared by Hand Tools	Hole Clearing Notes: Hand Tools
0	5						SP	Dry, Brown - light, Fine SAND	
5	10						SW	Damp, fine sand- light brown, little clay.	
10	15						SW	Moist, Brown - dark, Medium to Coarse SAND, Some Medium to Coarse Gravel	
15	19.5						GW	Wet, Brown, Coarse GRAVEL, Little Coarse Sand	
19.5	20						CL	Wet, Brown CLAY	
20	25						CL	Moist, Gray CLAY	
25	30						CL	Moist, Gray CLAY	
30	35							Wet, Gray - reddish CLAY	Pushed slightly and hit bedrock at 36 ft bgs

Soil Boring Log - Sonic

CLIENT:	Air National Guard	**PARSONS ON-SITE:**	Kylah Wyatt	**BORING/WELL #:**	BRLTNDG-MW05S
PROJECT NAME:	ANG ESI	**DRILLING CONTRACTOR:**	Cascade	**LOCATION DESCRIPTION**	
SITE NAME:	Burlington	**RIG TYPE:**	Mini Sonic	**COOR SYSTEM:**	WGS 1984 UTM Zone 18N
AREA OF CONCERN:	Downgradient	**MACHINE MODEL #:**	10-01422	**COOR TYPE:**	Surveyed
ADDRESS:		**DRILLING METHOD:**	Sonic	**NORTHING/LAT.:**	4927039.637
		LICENSED DRILLER:	Scotty Vermillon	**EASTING/LONG.:**	647380.9239
		DRILLING HELPERS:	Larry Turner; Lincoln Cohen	**XY COOR. UNIT:**	Meters
		BORE HOLE SIZE:	6 Inch	**ELEVATION:**	247.65
		CORE SAMPLER SIZE:	4 Inch	**Z COOR UNIT:**	Feet
		BORING LOG DATE/TIME:		**DRILLING ORIENTATION:**	
		DATE/TIME START:	07/02/2019 15:24	**BEARING:**	
		DATE/TIME FINISH:	07/02/2019 15:35	**INCLINATION:**	
		SAMPLING EQUIPMENT:		**BORING DETAILS:**	
		DEVICE LENGTH:		**INTERVAL TYPE:**	Discrete
		DEVICE COMMENTS:		**SOIL CLASS SYSTEM:**	Burmeister
		BACKFILL NOTES:	Monitoring well installed	**BORING LOG START DEPTH:**	0 Feet
				BORING LOG END DEPTH:	17.5 Feet

FIELD METER #1:		**FIELD METER #2:**	
TYPE:	PID	**TYPE:**	Water Level
SERIAL#:	592-919025	**SERIAL#:**	3010-1133
MODEL:	Mini rae3000	**MODEL:**	Solinst model 101
LIMIT:	0 ppm	**LIMIT:**	Ft
H&S:	5 ppm	**H&S:**	Ft
COMMENTS:		**COMMENTS:**	

DEPTH	Feet		**FIELD METER #1**		**FIELD METER #2**				
TOP	**BTM**	**SCREENING INTERVAL**	**ppm**	**H&S**	**Ft**		**USCS Class.**	**SOIL MATRIX DESCRIPTION**	**BORING INTERVAL NOTES**
0	0							Hole cleared by Hand Tools	Hole Clearing Notes: Hand Tools
0	5						GW	Dry, Brown - light, Coarse GRAVEL	
5	10						GW	Moist, Brown - light, Medium to Coarse GRAVEL	
10	15						GP	Wet, Brown - light, Medium to Coarse GRAVEL	
15	17.5						GP	Wet, Brown - light, Medium to Coarse GRAVEL	

Soil Boring Log - Sonic

CLIENT:	Air National Guard	**PARSONS ON-SITE:**	Dan Chamberland	**BORING/WELL #:**	BRLTNUP-MW01D
PROJECT NAME:	ANG ESI	**DRILLING CONTRACTOR:**	Cascade	**LOCATION DESCRIPTION**	
SITE NAME:	Burlington	**RIG TYPE:**	Mini Sonic	**COOR SYSTEM:**	WGS 1984 UTM Zone 18N
AREA OF CONCERN:	Upgradient	**MACHINE MODEL #:**	10-01422	**COOR TYPE:**	Surveyed
ADDRESS:	Right on the staked location. In the corner of taxiway F, runway 19 and runway 33	**DRILLING METHOD:**	Sonic	**NORTHING/LAT.:**	4926096.512
		LICENSED DRILLER:	Scotty Vermillon	**EASTING/LONG.:**	646992.741
		DRILLING HELPERS:	Lincoln Cohen	**XY COOR. UNIT:**	Meters
		BORE HOLE SIZE:	6 Inch	**ELEVATION:**	327.03
		CORE SAMPLER SIZE:	4 Inch	**Z COOR UNIT:**	Feet
		BORING LOG DATE/TIME:		**DRILLING ORIENTATION:**	
		DATE/TIME START:	06/26/2019 10:32	**BEARING:**	
		DATE/TIME FINISH:	06/26/2019 15:35	**INCLINATION:**	
		SAMPLING EQUIPMENT:		**BORING DETAILS:**	
		DEVICE LENGTH:		**INTERVAL TYPE:**	Discrete
		DEVICE COMMENTS:		**SOIL CLASS SYSTEM:**	Burmeister
		BACKFILL NOTES:	Monitoring well installed	**BORING LOG START DEPTH:**	0 Feet
				BORING LOG END DEPTH:	60 Feet

FIELD METER #1:		**FIELD METER #2:**	
TYPE:	PID	**TYPE:**	Water Level
SERIAL#:	592-919025	**SERIAL#:**	3010-1133
MODEL:	Minirae 3000	**MODEL:**	Solinst model 101
LIMIT:	0 ppm	**LIMIT:**	Ft
H&S:	5 ppm	**H&S:**	Ft
COMMENTS:		**COMMENTS:**	
Calibrated daily			

DEPTH	Feet		**FIELD METER #1**		**FIELD METER #2**				
TOP	**BTM**	**SCREENING INTERVAL**	**ppm**	**H&S**	**Ft**		**USCS Class.**	**SOIL MATRIX DESCRIPTION**	**BORING INTERVAL NOTES**
0	0							Hole cleared by Hand Tools	Hole Clearing Notes: Hand Tools
0	5						SP	Dry, Brown, Fine SAND, Trace Silt	
5	10							Damp, Brown - light, Fine to Medium SAND	
10	15						SP	Wet, Brown - dark, Fine SAND, Trace Coarse Sand	
15	20						SP	Wet, Brown, Fine SAND	
20	25							No Recovery	
25	30						SP	Wet, Brown, Fine SAND, Trace Silt	
30	35						SP	No Recovery	
35	40						SP	Wet, Gray - Brownish, Fine SAND, Little Silt	
40	45						SP	Wet, Gray, Fine SAND, Little Silt	
45	50						SP	Wet, Gray, Fine SAND, Little Silt	
50	53.5						SP	Wet, Gray, Fine SAND, Little Silt	
53.5	55						ML	Moist, Gray SILT, Little Medium Gravel	
55	57.5						ML	Moist, Gray - light SILT, Little Medium Gravel, Trace Medium Cobbles	
57.5	60						GP	Dry, White, Coarse BEDROCK	

APPENDIX C Photoionization Detector and Water Quality Instrument Calibration Logs

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	6
MODEL:	MiniRae 2000
UNIT IDENTIFICATION:	110-012170
DATE:	05/31/2019
TIME:	19:00
SAMPLER:	Dan Chamberland
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	100 ppm

COMMENTS:

Cal gas lot #:18-6614
Cal gas PN: 12150091

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	Downgradient
MODEL:	MiniRae 2000
UNIT IDENTIFICATION:	110-012170
DATE:	06/01/2019
TIME:	07:05
SAMPLER:	Dan Chamberland
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	100 ppm

COMMENTS:

Cal gas lot# 19-6791
Part number 12150091

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	6
MODEL:	MiniRae 2000
UNIT IDENTIFICATION:	110-014083
DATE:	05/31/2019
TIME:	07:00
SAMPLER:	Dan Chamberland
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	97.9 ppm

COMMENTS:

Cal gas lot# 18-6614
Part number 12150091

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	6
MODEL:	MiniRae 2000
UNIT IDENTIFICATION:	110-014083
DATE:	06/01/2019
TIME:	07:00
SAMPLER:	Dan Chamberland
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	100 ppm

COMMENTS:

Cal gas lot# 19-6791
Part number 12150091

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	
MODEL:	MiniRae 2000
UNIT IDENTIFICATION:	110-014083
DATE:	06/02/2019
TIME:	06:53
SAMPLER:	Dan Chamberland
ZERO AIR READING:	0.2 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	100 ppm

COMMENTS:

Cal gas lot# 19-6791
Part number 12150091

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	3
MODEL:	MiniRae 2000
UNIT IDENTIFICATION:	110-014083
DATE:	06/03/2019
TIME:	07:23
SAMPLER:	Tom Horn
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	98.1 ppm

COMMENTS:

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	3
MODEL:	MiniRae 2000
UNIT IDENTIFICATION:	110-014083
DATE:	06/04/2019
TIME:	07:00
SAMPLER:	Dan Chamberland
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	98.2 ppm

COMMENTS:

Cal gas lot# 19-6791
Part # 12150091

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	3
MODEL:	MiniRae 2000
UNIT IDENTIFICATION:	110-014083
DATE:	06/05/2019
TIME:	07:15
SAMPLER:	Dan Chamberland
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	100 ppm

COMMENTS:

Cal gas lot # 19-6791
Cal gas part # 12150091

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	6
MODEL:	MiniRae 2000
UNIT IDENTIFICATION:	110-014083
DATE:	06/10/2019
TIME:	07:36
SAMPLER:	Tom Horn
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	98.6 ppm

COMMENTS:

Lot # 19-6791. Date 4-26-23.

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	1
MODEL:	MiniRae 2000
UNIT IDENTIFICATION:	110-014589
DATE:	06/11/2019
TIME:	08:59
SAMPLER:	Dan Chamberland
ZERO AIR READING:	0.1 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	100 ppm

COMMENTS:

Cal gas lot # 19-6791
Part # 12150091

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	1
MODEL:	MiniRae 2000
UNIT IDENTIFICATION:	110-014589
DATE:	06/12/2019
TIME:	06:59
SAMPLER:	Dan Chamberland
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	104 ppm

COMMENTS:

Cal gas lot# 19-6791
Part number# 12150091

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	6
MODEL:	MiniRae 2000
UNIT IDENTIFICATION:	110-014589
DATE:	06/13/2019
TIME:	07:25
SAMPLER:	Dan Chamberland
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	101 ppm

COMMENTS:

Cal gas lot# 19-6791
Part # 12150091

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	3
MODEL:	MiniRae 2000
UNIT IDENTIFICATION:	110-014589
DATE:	06/14/2019
TIME:	08:02
SAMPLER:	Dan Chamberland
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	102 ppm

COMMENTS:

Cal gas lot # 19-6791
Part number 12150091

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	3
MODEL:	MiniRae 2000
UNIT IDENTIFICATION:	110-014589
DATE:	06/15/2019
TIME:	06:57
SAMPLER:	Dan Chamberland
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	97.7 ppm

COMMENTS:

Cal gas lot #19-6791
Part number 12150091

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	Downgradient
MODEL:	MiniRae 2000
UNIT IDENTIFICATION:	110-014589
DATE:	06/16/2019
TIME:	07:05
SAMPLER:	Dan Chamberland
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	94.9 ppm

COMMENTS:

Cal gas lot # 19-6791
Part number: 12150091

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	Downgradient
MODEL:	MiniRae 2000
UNIT IDENTIFICATION:	110-014589
DATE:	06/17/2019
TIME:	06:56
SAMPLER:	Dan Chamberland
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	96.8 ppm

COMMENTS:

Cal gas lot # 19-6791
Part number 12150091

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	-
MODEL:	MiniRae 2000
UNIT IDENTIFICATION:	110-014589
DATE:	06/18/2019
TIME:	07:06
SAMPLER:	Kylah Wyatt
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	100 ppm

COMMENTS:

Part: 12150091
Lot: 19-6791

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	6
MODEL:	MiniRae 2000
UNIT IDENTIFICATION:	110-014589
DATE:	06/24/2019
TIME:	07:06
SAMPLER:	Dan Chamberland
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	95.3 ppm

COMMENTS:

Cal gas lot# 19-6791
Part number: 12150091

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	6
MODEL:	MiniRae 2000
UNIT IDENTIFICATION:	110-014589
DATE:	06/25/2019
TIME:	06:50
SAMPLER:	Dan Chamberland
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	92.4 ppm

COMMENTS:

Cal gas lot # 19-6791
Part number 12150091

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	Upgradient
MODEL:	MiniRae 2000
UNIT IDENTIFICATION:	110-014589
DATE:	06/28/2019
TIME:	07:30
SAMPLER:	Dan Chamberland
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	93.8 ppm

COMMENTS:

Lot number: 19-6791
Part number: 12150091

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	-
MODEL:	MiniRae 2000
UNIT IDENTIFICATION:	110-014589
DATE:	06/30/2019
TIME:	08:00
SAMPLER:	Dan Chamberland
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	97.5 ppm

COMMENTS:

Cal gas lot number: 19-6791
Part number:12150091

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	-
MODEL:	MiniRae 2000
UNIT IDENTIFICATION:	110-014589
DATE:	07/01/2019
TIME:	06:47
SAMPLER:	Kylah Wyatt
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	101 ppm

COMMENTS:

Expiration: 4/26/23
Fill date: 4/26/19

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	-
MODEL:	MiniRae 2000
UNIT IDENTIFICATION:	110-014589
DATE:	07/02/2019
TIME:	06:54
SAMPLER:	Dan Chamberland
ZERO AIR READING:	0.1 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	97.3 ppm

COMMENTS:

Cal gas lot# 19-6791
Part number: 12150091

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	Downgradient
MODEL:	MiniRae 2000
UNIT IDENTIFICATION:	110-014589
DATE:	07/08/2019
TIME:	08:41
SAMPLER:	Dan Chamberland
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	90.7 ppm

COMMENTS:

Cal gas lot#:19-6791
Part number: 12150091

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	-
MODEL:	MiniRae 2000
UNIT IDENTIFICATION:	110-014589
DATE:	07/09/2019
TIME:	07:20
SAMPLER:	Dan Chamberland
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	98.6 ppm

COMMENTS:

Cal gas lot #: 19-6791
Part number: 12150091

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	Downgradient
MODEL:	MiniRae 2000
UNIT IDENTIFICATION:	110-014589
DATE:	07/10/2019
TIME:	07:14
SAMPLER:	Dan Chamberland
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	93.1 ppm

COMMENTS:

Cal gas lot# 19-6791
Part number: 12150091

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	-
MODEL:	MiniRae 2000
UNIT IDENTIFICATION:	110-014589
DATE:	07/11/2019
TIME:	07:05
SAMPLER:	Dan Chamberland
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	94 ppm

COMMENTS:

Cal gas lot# 19-6791
Part number: 12150091

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	Downgradient
MODEL:	MiniRae 3000
UNIT IDENTIFICATION:	110-014589
DATE:	07/12/2019
TIME:	07:15
SAMPLER:	Dan Chamberland
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	101 ppm

COMMENTS:

Expiration: 4/26/23
Fill date: 4/26/19

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	-
MODEL:	MiniRae 2000
UNIT IDENTIFICATION:	110-014589
DATE:	07/13/2019
TIME:	07:16
SAMPLER:	Dan Chamberland
ZERO AIR READING:	0.2 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	98.4 ppm

COMMENTS:

Cal gas lot # 19-6791
Part number: 12150091

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	6
MODEL:	MiniRae 2000
UNIT IDENTIFICATION:	110-014589
DATE:	07/14/2019
TIME:	08:21
SAMPLER:	Kylah Wyatt
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	103 ppm

COMMENTS:

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	6
MODEL:	MiniRae 3000
UNIT IDENTIFICATION:	110-014589
DATE:	07/15/2019
TIME:	07:22
SAMPLER:	Kylah Wyatt
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	104 ppm

COMMENTS:

Expiration: 4/26/23
Fill date: 4/26/19

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	-
MODEL:	MiniRae 2000
UNIT IDENTIFICATION:	110-902957
DATE:	07/10/2019
TIME:	07:18
SAMPLER:	Dan Chamberland
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	97.9 ppm

COMMENTS:

Cal gas lot# 19-6791
Part number: 12150091

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	3
MODEL:	MiniRae 3000
UNIT IDENTIFICATION:	110-902957
DATE:	07/12/2019
TIME:	07:22
SAMPLER:	Dan Chamberland
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	101 ppm

COMMENTS:

Expiration: 4/26/23
Fill date: 4/26/19

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	Downgradient
MODEL:	MiniRae 3000
UNIT IDENTIFICATION:	592-919025
DATE:	06/10/2019
TIME:	08:49
SAMPLER:	Dan Chamberland
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	100 ppm

COMMENTS:

Cal gas lot #19-6791
Part # 12150091

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	6
MODEL:	MiniRae 3000
UNIT IDENTIFICATION:	592-919025
DATE:	06/11/2019
TIME:	07:15
SAMPLER:	Dan Chamberland
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	100 ppm

COMMENTS:

Cal gas lot# 19-6791
Part# 12150091

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	6
MODEL:	MiniRae 3000
UNIT IDENTIFICATION:	592-919025
DATE:	06/12/2019
TIME:	06:50
SAMPLER:	Dan Chamberland
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	100 ppm

COMMENTS:

Cal gas lot# 19-6791
Part number# 12150091

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	6
MODEL:	MiniRae 3000
UNIT IDENTIFICATION:	592-919025
DATE:	06/13/2019
TIME:	07:20
SAMPLER:	Dan Chamberland
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	100 ppm

COMMENTS:

Cal gas lot# 19-6791
Part # 12150091

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	6
MODEL:	MiniRae 3000
UNIT IDENTIFICATION:	592-919025
DATE:	06/14/2019
TIME:	07:52
SAMPLER:	Dan Chamberland
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	100 ppm

COMMENTS:

Cal gas lot # 19-6791
Part number: 12150091

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	3
MODEL:	MiniRae 3000
UNIT IDENTIFICATION:	592-919025
DATE:	06/15/2019
TIME:	06:47
SAMPLER:	Dan Chamberland
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	100 ppm

COMMENTS:

Cal gas lot# 19-6791
Part number 12150091

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	Downgradient
MODEL:	MiniRae 3000
UNIT IDENTIFICATION:	592-919025
DATE:	06/16/2019
TIME:	07:07
SAMPLER:	Dan Chamberland
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	100 ppm

COMMENTS:

Cal gas lot# 19-6791
Part number 12150091

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	Downgradient
MODEL:	MiniRae 3000
UNIT IDENTIFICATION:	592-919025
DATE:	06/17/2019
TIME:	06:51
SAMPLER:	Dan Chamberland
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	100 ppm

COMMENTS:

Cal gas lot# 19-6791
Part number 12150091

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	4
MODEL:	MiniRae 3000
UNIT IDENTIFICATION:	592-919025
DATE:	06/24/2019
TIME:	07:00
SAMPLER:	Dan Chamberland
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	100 ppm

COMMENTS:

Cal gas lot # 19-6791
Part number 12150091

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	4
MODEL:	MiniRae 3000
UNIT IDENTIFICATION:	592-919025
DATE:	06/25/2019
TIME:	06:46
SAMPLER:	Dan Chamberland
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	100 ppm

COMMENTS:

Cal gas lot # 19-6791
Part number: 12150091

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	Upgradient
MODEL:	MiniRae 3000
UNIT IDENTIFICATION:	592-919025
DATE:	06/26/2019
TIME:	07:05
SAMPLER:	Dan Chamberland
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	100 ppm

COMMENTS:

Cal gas lot# 19-6791
Part number 12150091

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	Downgradient
MODEL:	MiniRae 3000
UNIT IDENTIFICATION:	592-919025
DATE:	06/28/2019
TIME:	07:25
SAMPLER:	Dan Chamberland
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	100 ppm

COMMENTS:

Cal gas lot# 19-6791
Part number: 12150091

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	4
MODEL:	MiniRae 3000
UNIT IDENTIFICATION:	592-919025
DATE:	06/29/2019
TIME:	08:18
SAMPLER:	Dan Chamberland
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	100 ppm

COMMENTS:

Cal gas lot number: 19-6791
Part number: 12150091

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	Downgradient
MODEL:	MiniRae 3000
UNIT IDENTIFICATION:	592-919025
DATE:	06/30/2019
TIME:	07:39
SAMPLER:	Dan Chamberland
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	100 ppm

COMMENTS:

Cal gas lot number: 19-6791
Part number: 12150091

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	Downgradient
MODEL:	MiniRae 3000
UNIT IDENTIFICATION:	592-919025
DATE:	07/02/2019
TIME:	06:47
SAMPLER:	Dan Chamberland
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	100 ppm

COMMENTS:

Cal gas lot # 19-6791
Part number: 12150091

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	Downgradient
MODEL:	MiniRae 3000
UNIT IDENTIFICATION:	592-919025
DATE:	07/08/2019
TIME:	07:33
SAMPLER:	Dan Chamberland
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	100 ppm

COMMENTS:

Lot number: 19-6791
Part number: 12150091

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	Downgradient
MODEL:	MiniRae 3000
UNIT IDENTIFICATION:	592-919025
DATE:	07/09/2019
TIME:	07:13
SAMPLER:	Dan Chamberland
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	100 ppm

COMMENTS:

Cal gas lot #: 19-6791
Part number: 12150091

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	Downgradient
MODEL:	MiniRae 3000
UNIT IDENTIFICATION:	592-919025
DATE:	07/10/2019
TIME:	07:11
SAMPLER:	Dan Chamberland
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	100 ppm

COMMENTS:

Cal gas lot# 19-6791
Part number: 12150091

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	-
MODEL:	MiniRae 3000
UNIT IDENTIFICATION:	592-919025
DATE:	07/11/2019
TIME:	07:01
SAMPLER:	Dan Chamberland
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	100 ppm

COMMENTS:

Cal gas lot# 19-6791
Part number: 12150091

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	Downgradient
MODEL:	MiniRae 3000
UNIT IDENTIFICATION:	592-919025
DATE:	07/12/2019
TIME:	07:10
SAMPLER:	Dan Chamberland
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	100 ppm

COMMENTS:

Expiration: 4/26/23
Fill date: 4/26/19

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	3
MODEL:	MiniRae 3000
UNIT IDENTIFICATION:	592-919025
DATE:	07/13/2019
TIME:	07:12
SAMPLER:	Dan Chamberland
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	100 ppm

COMMENTS:

Cal gas lot #: 19-6791
Part number: 12150091

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	-
MODEL:	MiniRae 3000
UNIT IDENTIFICATION:	592-919025u4
DATE:	06/18/2019
TIME:	06:56
SAMPLER:	Kylah Wyatt
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	100 ppm

COMMENTS:

Exp: 4/26/23
Lot: 19-6791

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	4
MODEL:	MiniRae 3000
UNIT IDENTIFICATION:	592-919025u4
DATE:	06/19/2019
TIME:	07:03
SAMPLER:	Kylah Wyatt
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	100 ppm

COMMENTS:

Lot: 19-6791
Fill: 4/29/19

PID CALIBRATION SHEET

SITE:	Burlington
AOC:	-
MODEL:	MiniRae 3000
UNIT IDENTIFICATION:	592-919025u4
DATE:	07/01/2019
TIME:	06:47
SAMPLER:	Kylah Wyatt
ZERO AIR READING:	0 ppm
CALIBRATION GAS:	100.0 ppm Isobutylene
CALIBRATION GAS READING:	100 ppm

COMMENTS:

Expiration: 4/26/23
Fill date: 4/26/19

FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Kylah Wyatt				
Date:	30-May-2019	**Usage Start Time:**	05:49	**Usage End Time:**	05:49
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Pro Plus	Model:	Pro Plus
Serial Number:	12L100463	Serial Number:	Pro Plus
ID Number:	12L100463	ID Number:	10D101384

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13120C029745	Serial Number:	-
ID Number:	13120C029745	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	22.40	**Standard: 240 mV**	
Bar Pres (mmHg):	759.2	Temperature (°C):	12.10
Initial O2 Saturation (%):	106.2	Initial (mV):	268.0
Initial Reading (mg/L):	9.75	Reset to (mV):	248.6
Final O2 Saturation (%):	113.0	Lot No. (240mV):	9GD822
Meter Reset to (mg/L):	9.75	Exp. Date:	01-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	20.6	20	A8079	01-Mar-2020
100/	96.8	100	A6229	01-Aug-2019
800/	830	800	A8080	01-Mar-2020
10/	9.5	10	A8061	01-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.029 mS/cmc	1.029 mS/cmc	1.038 mS/cmc	16.1 deg C	8GK017/11-01-2019
	5 Point Calibration Check (Instrument Readings within +/- 10%)			No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	06:35	15.20	3.39	149.8	4.00	8GL515/12-01-2020
10.00	06:36	14.50	10.48	-190.3	10.18	9GD175/04-01-2021
7.00 Check	06:42	15.10	6.97	226.0	N/A	7GK331/11-01-2019

Analyst Name/Signature & Date Completed: Kylah Wyatt Date: 30-May-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Aaron sutton				
Date:	31-May-2019	**Usage Start Time:**	07:56	**Usage End Time:**	05:56
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	Hach
Model:	Proplus	Model:	2100q
Serial Number:	10d101384	Serial Number:	13120c029745
ID Number:	12l100463	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100q	Model:	-
Serial Number:	13120c29745	Serial Number:	-
ID Number:	Same as s#	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	17.30	**Standard: 240 mV**	
Bar Pres (mmHg):	761.5	Temperature (°C):	10.40
Initial O2 Saturation (%):	90.4	Initial (mV):	242.2
Initial Reading (mg/L):	8.65	Reset to (mV):	250.7
Final O2 Saturation (%):	89.8	Lot No. (240mV):	9gd822
Meter Reset to (mg/L):	8.57	Exp. Date:	28-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	19.7	20	A8079	30-Mar-2020
100/	91.6	100	A6229	01-Aug-2019
800/	743	800	A8080	30-Mar-2020
10/Blank	9.4	-	A8061	30-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.41 mS/cmc	1.41 mS/cmc	1.41 mS/cmc	15.8 deg C	9ge117/05-31-2020
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	08:01	16.00	3.64	151.1	4.00	Lgk331/11-30-2019
10.00	08:06	16.00	10.57	-196.2	10.11	7gk253/11-30-2019
7.00 Check	08:12	16.00	7.04	-23.7	N/A	7gk331/11-30-2019

Analyst Name/Signature & Date Completed: Aaron Sutton Date: 31-May-2019

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FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Aaron Sutton				
Date:	31-May-2019	**Usage Start Time:**	16:33	**Usage End Time:**	16:33
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	-
Model:	Proplus	Model:	-
Serial Number:	10d101384	Serial Number:	-
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100q	Model:	-
Serial Number:	13120c029745	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	18.80	**Standard: 240 mV**	
Bar Pres (mmHg):	761.3	Temperature (°C):	9.30
Initial O2 Saturation (%):	104.2	Initial (mV):	251.3
Initial Reading (mg/L):	9.66	Reset to (mV):	252.1
Final O2 Saturation (%):	107.0	Lot No. (240mV):	9GD822
Meter Reset to (mg/L):	9.69	Exp. Date:	01-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	20.3	20	A8079	01-Mar-2020
100/	113	100	A6229	01-Aug-2019
800/	774	800	A8080	01-Mar-2020
10/Blank	9.7	10	A8061	01-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.48 mS/cmc	1.48 mS/cmc	1.48 mS/cmc	16.1 deg C	9ge117/05-31-2020

5 Point Calibration Check (Instrument Readings within +/- 10%)

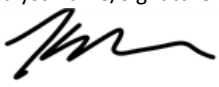
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	16:44	17.00	4.21	128.3	4.00	7gk331/11-30-2019
10.00	16:46	17.70	9.79	-184.9	10.09	7gk253/11-30-2019
7.00 Check	16:51	17.60	7.00	5730.0	N/A	7gk331/05-31-2019

Analyst Name/Signature & Date Completed: Aaron Sutton Date: 31-May-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Aaron Sutton				
Date:	01-Jun-2019	**Usage Start Time:**	08:01	**Usage End Time:**	08:01
				Usage = Time instrument used in field	

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Pro Plus
Serial Number:	17F100379	Serial Number:	10E100342
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13100C028843	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	13.00	**Standard: 240 mV**	
Bar Pres (mmHg):	753.6	Temperature (°C):	10.10
Initial O2 Saturation (%):	101.9	Initial (mV):	252.2
Initial Reading (mg/L):	10.79	Reset to (mV):	251.5
Final O2 Saturation (%):	102.2	Lot No. (240mV):	9GD822
Meter Reset to (mg/L):	10.73	Exp. Date:	01-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	19	20	Unknown	01-Jun-2019
10/Blank	10.1	10	A8221	01-Aug-2020
100/	98.2	100	Unknown	01-Jun-2019
800/	803	800	A7062	01-Jun-2019

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.36 mS/cmc	1.36 mS/cmc	1.36 mS/cmc	14.6 deg C	9GE117/05-01-2020
	5 Point Calibration Check (Instrument Readings within +/- 10%)			No	

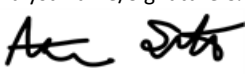
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	08:35	15.70	3.93	121.3	4.00	7GK331/11-01-2019
10.00	08:38	16.50	10.20	-214.0	10.00	7GK253/11-01-2019
7.00 Check	08:41	16.50	7.05	58.2	N/A	7GK331/11-01-2019

Analyst Name/Signature & Date Completed: Aaron sutton Date: 01-Jun-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Kylah Wyatt				
Date:	01-Jun-2019	**Usage Start Time:**	08:02	**Usage End Time:**	07:34
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Proplus
Serial Number:	12L100463	Serial Number:	10D101384
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100q	Model:	-
Serial Number:	13120C029745	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	9.10	**Standard: 240 mV**	
Bar Pres (mmHg):	763.4	Temperature (°C):	7.40
Initial O2 Saturation (%):	107.1	Initial (mV):	251.8
Initial Reading (mg/L):	12.43	Reset to (mV):	254.8
Final O2 Saturation (%):	107.4	Lot No. (240mV):	9gd822
Meter Reset to (mg/L):	12.41	Exp. Date:	01-Jun-2019

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	19.2	20	A8079	01-Mar-2020
100/	98.2	100	A6229	01-Aug-2019
800/	866	800	A8080	01-Mar-2020
10/Blank	9.7	-	A8061	01-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	0.77 mS/cmc	0.77 mS/cmc	0.77 mS/cmc	12.9 deg C	9ge117/05-01-2020
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

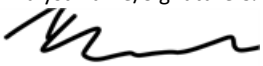
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	07:38	13.80	3.54	148.3	4.00	7gk331/11-01-2019
10.00	07:39	14.10	10.54	-194.1	10.14	7gk253/11-01-2019
7.00 Check	07:43	13.80	7.03	230.5	N/A	7gk331/11-01-2019

Analyst Name/Signature & Date Completed: Date: 01-Jun-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Aaron Sutton				
Date:	01-Jun-2019	**Usage Start Time:**	15:38	**Usage End Time:**	15:38
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Proplus
Serial Number:	17f1000379	Serial Number:	10e100342
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100q	Model:	-
Serial Number:	13100c02843	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	27.20	**Standard: 240 mV**	
Bar Pres (mmHg):	751.0	Temperature (°C):	18.20
Initial O2 Saturation (%):	102.7	Initial (mV):	-
Initial Reading (mg/L):	8.17	Reset to (mV):	-
Final O2 Saturation (%):	102.9	Lot No. (240mV):	ORP bulb broken. Calibration not possible
Meter Reset to (mg/L):	8.17	Exp. Date:	01-Jun-2019

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	21.2	20	Unk	01-Jun-2019
100/	97.8	100	Unk	01-Jun-2019
800/	781	800	A7062	01-Jun-2019
10/Blank	9.3	10	A8221	01-Aug-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.39 mS/cmc	1.39 mS/cmc	1.39 mS/cmc	25.1 deg C	9GE17/05-01-2020
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	15:42	22.20	3.91	123.9	4.00	7gk331/11-01-2019
10.00	15:44	22.60	10.19	-217.9	10.00	7GK253/11-01-2019
7.00 Check	15:45	22.60	6.91	-46.2	N/A	7GK331/11-01-2019

Analyst Name/Signature & Date Completed: Aaron Sutton Date: 01-Jun-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Dan Chamberland				
Date:	01-Jun-2019	**Usage Start Time:**	17:09	**Usage End Time:**	17:09
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Pro Plus
Serial Number:	12L100463	Serial Number:	10D101384
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13100C028843	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	25.30	**Standard: 240 mV**	
Bar Pres (mmHg):	759.7	Temperature (°C):	17.30
Initial O2 Saturation (%):	105.2	Initial (mV):	262.3
Initial Reading (mg/L):	8.49	Reset to (mV):	242.0
Final O2 Saturation (%):	104.9	Lot No. (240mV):	9GD822
Meter Reset to (mg/L):	8.56	Exp. Date:	01-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	21.7	20	A8079	01-Mar-2020
100/	99.7	100	A6229	01-Aug-2019
800/	799	800	A8080	01-May-2020
10/Blank	9.3	10	A8061	01-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.41 mS/cmc	1.41 mS/cmc	1.41 mS/cmc	20.6 deg C	9GE117/05-01-2020
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

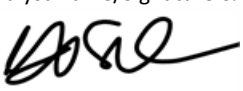
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	17:10	19.60	3.78	142.3	4.00	7GK331/11-01-2019
10.00	17:13	19.80	10.14	183.4	10.00	7GK253/11-01-2019
7.00 Check	17:18	19.40	7.05	-26.4	N/A	7GK331/11-01-2019

Analyst Name/Signature & Date Completed: Dan Chamberland Date: 01-Jun-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Aaron Sutton				
Date:	02-Jun-2019	**Usage Start Time:**	07:23	**Usage End Time:**	07:23
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Pro Plus
Serial Number:	12L100463	Serial Number:	10D101384
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13120C029745	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	16.00	**Standard: 240 mV**	
Bar Pres (mmHg):	757.8	Temperature (°C):	13.60
Initial O2 Saturation (%):	104.4	Initial (mV):	223.7
Initial Reading (mg/L):	10.31	Reset to (mV):	246.8
Final O2 Saturation (%):	104.7	Lot No. (240mV):	9GD822
Meter Reset to (mg/L):	10.32	Exp. Date:	01-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	19.7	20	A8079	01-Mar-2020
100/	147	100	A6229	01-Aug-2019
800/	917	800	A8080	01-Mar-2020
10/Blank	9.4	10	A8061	01-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.46 mS/cmc	1.46 mS/cmc	1.46 mS/cmc	16.1 deg C	9GE117/05-01-2020
	5 Point Calibration Check (Instrument Readings within +/- 10%)			No	

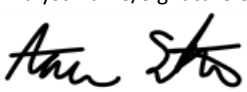
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	07:28	16.50	3.83	142.9	4.00	7GK331/11-01-2019
10.00	07:28	16.80	10.44	-197.4	10.00	7GK253/11-01-2019
7.00 Check	07:33	16.80	7.03	-28.3	N/A	7GK331/11-01-2019

Analyst Name/Signature & Date Completed: Aaron Sutton Date: 02-Jun-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Kylah Wyatt				
Date:	02-Jun-2019	**Usage Start Time:**	16:30	**Usage End Time:**	16:30
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Proplus
Serial Number:	12l100463	Serial Number:	10d101384
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100q	Model:	-
Serial Number:	13100c028843	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	18.50	**Standard: 240 mV**	
Bar Pres (mmHg):	756.0	Temperature (°C):	18.10
Initial O2 Saturation (%):	102.6	Initial (mV):	243.8
Initial Reading (mg/L):	9.55	Reset to (mV):	241.1
Final O2 Saturation (%):	102.1	Lot No. (240mV):	9gd822
Meter Reset to (mg/L):	9.55	Exp. Date:	02-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	19.5	20	Unk	02-Jun-2019
100/	103	100	Unk	02-Jun-2019
800/	802	800	A7062	02-Jun-2019
10/Blank	10	9.7	A8221	02-Aug-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.461 mS/cmc	1.461 mS/cmc	0.98 mS/cmc	17.8 deg C	9ge117/05-02-2020
	5 Point Calibration Check (Instrument Readings within +/- 10%)			No	

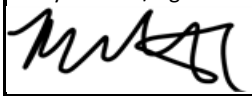
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	16:36	17.20	3.90	137.7	4.00	7gk331/11-02-2019
10.00	16:37	17.60	10.33	-180.2	10.10	/06-02-2019
7.00 Check	16:40	17.80	6.93	-29.2	N/A	7gk331/11-02-2019

Analyst Name/Signature & Date Completed: Kylah Wyatt Date: 02-Jun-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Aaron Sutton				
Date:	03-Jun-2019	**Usage Start Time:**	07:34	**Usage End Time:**	07:34
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Pro Plus
Serial Number:	12L100463	Serial Number:	10D101384
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	1300C028843	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	9.90	**Standard: 240 mV**	
Bar Pres (mmHg):	759.7	Temperature (°C):	7.10
Initial O2 Saturation (%):	104.6	Initial (mV):	258.6
Initial Reading (mg/L):	11.84	Reset to (mV):	256.2
Final O2 Saturation (%):	104.6	Lot No. (240mV):	9GD822
Meter Reset to (mg/L):	11.83	Exp. Date:	01-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	23.5	20	A8079	01-Mar-2020
100/	101	100	A6229	01-Aug-2019
800/	801	800	A8080	01-Mar-2020
10/Blank	9.6	10	A8061	01-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.51 mS/cmc	1.51 mS/cmc	1.51 mS/cmc	13.2 deg C	9GE117/05-01-2020
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

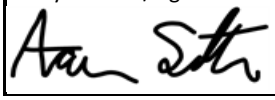
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	07:37	13.90	3.61	144.2	4.00	7GK331/11-01-2019
10.00	07:37	14.10	10.56	-199.3	10.00	7GK253/11-01-2019
7.00 Check	07:41	14.10	7.04	-28.9	N/A	7GK331/11-01-2019

Analyst Name/Signature & Date Completed: Aaron Sutton Date: 03-Jun-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Aaron Sutton				
Date:	03-Jun-2019	**Usage Start Time:**	11:28	**Usage End Time:**	11:28
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Pro Plus
Serial Number:	12L100463	Serial Number:	10D101384
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13100C028843	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	23.30	**Standard: 240 mV**	
Bar Pres (mmHg):	760.9	Temperature (°C):	23.90
Initial O2 Saturation (%):	97.9	Initial (mV):	234.1
Initial Reading (mg/L):	8.33	Reset to (mV):	232.9
Final O2 Saturation (%):	97.8	Lot No. (240mV):	9GD822
Meter Reset to (mg/L):	8.33	Exp. Date:	01-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	19.9	20	Unknown	03-Jun-2019
100/	99.7	100	Unknown	03-Jun-2019
800/	790	800	A7062	03-Jun-2019
10/Blank	10.1	10	A8221	01-Aug-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.49 mS/cmc	1.49 mS/cmc	1.49 mS/cmc	19.4 deg C	9GE117/05-01-2020
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

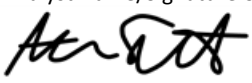
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	11:33	18.50	3.97	134.9	4.00	7GK331/11-01-2019
10.00	11:34	19.40	10.43	-204.0	10.00	7GK253/11-01-2019
7.00 Check	11:38	19.10	7.00	-30.0	N/A	7GK331/11-01-2019

Analyst Name/Signature & Date Completed: Aaron Sutton Date: 03-Jun-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Dan Chamberland				
Date:	03-Jun-2019	**Usage Start Time:**	18:13	**Usage End Time:**	18:13
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Pro Plus
Serial Number:	18L100171	Serial Number:	11M100702
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13100C028843	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	14.10	**Standard: 240 mV**	
Bar Pres (mmHg):	750.8	Temperature (°C):	13.30
Initial O2 Saturation (%):	109.3	Initial (mV):	217.2
Initial Reading (mg/L):	11.09	Reset to (mV):	247.2
Final O2 Saturation (%):	107.4	Lot No. (240mV):	9GD822
Meter Reset to (mg/L):	11.09	Exp. Date:	01-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	20.4	20	Unknown	03-Jun-2019
100/	101	100	Unknown	03-Jun-2019
800/	807	800	A7062	03-Jun-2019
10/Blank	10	10	A8221	01-Aug-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.466 mS/cmc	1.466 mS/cmc	1.41 mS/cmc	14.1 deg C	9GE117/05-01-2020
	5 Point Calibration Check (Instrument Readings within +/- 10%)			No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	18:21	14.10	4.10	-	4.00	7GK331/11-01-2019
10.00	18:22	14.10	10.07	-	10.00	7GK253/11-01-2019
7.00 Check	18:22	14.10	7.02	-	N/A	7GK331/11-01-2019

Analyst Name/Signature & Date Completed: Dan Chamberland Date: 03-Jun-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Aaron Sutton				
Date:	04-Jun-2019	**Usage Start Time:**	07:34	**Usage End Time:**	07:34
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Pro Plus
Serial Number:	12L100463	Serial Number:	10D101384
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13120C029745	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	11.40	**Standard: 240 mV**	
Bar Pres (mmHg):	768.0	Temperature (°C):	7.60
Initial O2 Saturation (%):	107.0	Initial (mV):	269.2
Initial Reading (mg/L):	11.79	Reset to (mV):	254.4
Final O2 Saturation (%):	107.1	Lot No. (240mV):	9GD822
Meter Reset to (mg/L):	11.78	Exp. Date:	01-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	19.9	20	A8079	01-Mar-2020
100/	98.8	100	A6229	01-Aug-2019
800/	805	800	A8080	01-Mar-2020
100/Blank	9.7	10	A8061	01-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.56 mS/cmc	1.56 mS/cmc	1.56 mS/cmc	9.2 deg C	9GE117/05-01-2020
	5 Point Calibration Check (Instrument Readings within +/- 10%)			No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	07:39	10.40	3.72	138.8	4.00	7GK331/11-01-2019
10.00	07:39	10.30	10.45	-194.7	10.00	7GK253/11-01-2019
7.00 Check	07:43	10.50	7.06	-33.7	N/A	7GK331/11-01-2019

Analyst Name/Signature & Date Completed: Aaron Sutton Date: 04-Jun-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Aaron Sutton				
Date:	04-Jun-2019	**Usage Start Time:**	07:58	**Usage End Time:**	07:58
				Usage = Time instrument used in field	

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Pro Plus
Serial Number:	18L100171	Serial Number:	11M100702
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13100C028843	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	15.10	**Standard: 240 mV**	
Bar Pres (mmHg):	754.7	Temperature (°C):	11.00
Initial O2 Saturation (%):	136.6	Initial (mV):	238.9
Initial Reading (mg/L):	13.61	Reset to (mV):	250.2
Final O2 Saturation (%):	135.2	Lot No. (240mV):	9GD822
Meter Reset to (mg/L):	13.59	Exp. Date:	01-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	19.5	20	Unknown	04-Jun-2019
100/	100	100	Unknown	04-Jun-2019
800/	805	800	A7062	04-Jun-2019
10/Blank	10.4	10	A8221	01-Aug-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.48 mS/cmc	1.48 mS/cmc	1.48 mS/cmc	13.1 deg C	9GE117/05-01-2020
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

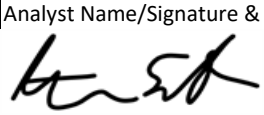
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	08:04	13.20	3.97	139.0	4.00	7GK331/11-01-2019
10.00	08:11	13.30	10.12	-192.1	10.00	7GK253/11-01-2019
7.00 Check	08:13	13.40	6.96	-19.5	N/A	7GK331/11-01-2019

Analyst Name/Signature & Date Completed: Aaron Sutton Date: 04-Jun-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Aaron Sutton				
Date:	04-Jun-2019	**Usage Start Time:**	14:33	**Usage End Time:**	14:33
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Pro Plus
Serial Number:	12L100463	Serial Number:	10D101384
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13120C029745	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	23.80	**Standard: 240 mV**	
Bar Pres (mmHg):	765.7	Temperature (°C):	23.00
Initial O2 Saturation (%):	94.0	Initial (mV):	229.8
Initial Reading (mg/L):	7.93	Reset to (mV):	234.7
Final O2 Saturation (%):	94.4	Lot No. (240mV):	9GD822
Meter Reset to (mg/L):	7.94	Exp. Date:	01-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	19.6	20	A8079	01-Mar-2020
100/	99	100	A6229	01-Aug-2019
800/	779	800	A8080	01-Mar-2020
10/Blank	9.6	10	A8061	01-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.51 mS/cmc	1.51 mS/cmc	1.51 mS/cmc	19.3 deg C	9GE117/05-01-2020
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	14:36	17.50	3.78	139.8	4.00	7GK331/11-01-2019
10.00	14:37	18.60	10.43	-201.1	10.00	7GK253/11-01-2019
7.00 Check	14:40	17.90	7.02	-29.9	N/A	7GK331/11-01-2019

Analyst Name/Signature & Date Completed: Aaron Sutton Date: 04-Jun-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Dan chamberland				
Date:	04-Jun-2019	**Usage Start Time:**	14:35	**Usage End Time:**	14:50
				Usage = Time instrument used in field	

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro pro plus	Model:	Quatro pro plus
Serial Number:	18L100171	Serial Number:	11M100702
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13100C028843	Serial Number:	-
ID Number:	3550-1016	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	24.00	**Standard: 240 mV**	
Bar Pres (mmHg):	752.9	Temperature (°C):	25.20
Initial O2 Saturation (%):	118.6	Initial (mV):	215.9
Initial Reading (mg/L):	8.35	Reset to (mV):	231.7
Final O2 Saturation (%):	99.2	Lot No. (240mV):	9GD822
Meter Reset to (mg/L):	8.35	Exp. Date:	01-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/Blank	20.2	20	Unknown	01-Jan-2020
100/Blank	99	100	Unknown	01-Jan-2020
800/Blank	801	800	A7062	01-Jan-2020
10/	9.8	10	A8221	01-Aug-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.42 mS/cmc	1.42 mS/cmc	1.42 mS/cmc	23.3 deg C	9GE117/05-01-2020
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

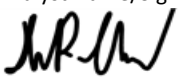
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	14:44	21.60	4.01	146.3	4.00	7GK331/11-01-2019
10.00	14:49	22.40	9.99	-190.9	10.00	7GK253/11-01-2019
7.00 Check	14:52	22.30	6.99	-20.6	N/A	7GK331/11-01-2019

Analyst Name/Signature & Date Completed: Dan Chamberland Date: 04-Jun-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Aaron Sutton				
Date:	05-Jun-2019	**Usage Start Time:**	07:42	**Usage End Time:**	07:42
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Pro Plus
Serial Number:	12L100463	Serial Number:	10D101384
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13120C029745	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	12.60	**Standard: 240 mV**	
Bar Pres (mmHg):	763.2	Temperature (°C):	10.00
Initial O2 Saturation (%):	103.4	Initial (mV):	255.0
Initial Reading (mg/L):	10.98	Reset to (mV):	251.2
Final O2 Saturation (%):	103.2	Lot No. (240mV):	9GD822
Meter Reset to (mg/L):	10.98	Exp. Date:	01-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	21.1	20	A8079	01-Mar-2020
100/	99.5	100	A6229	01-Aug-2019
800/	815	800	A8080	01-Mar-2020
10/Blank	9.2	10	A8061	01-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.55 mS/cmc	1.55 mS/cmc	1.55 mS/cmc	12.8 deg C	9GE117/05-01-2020
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

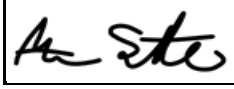
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	07:47	12.80	3.81	136.9	4.00	7GK331/11-01-2019
10.00	07:47	13.00	10.41	-197.2	10.00	7GK253/11-01-2019
7.00 Check	07:56	13.30	6.91	-29.6	N/A	7GK331/11-01-2019

Analyst Name/Signature & Date Completed: Aaron Sutton Date: 05-Jun-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Dan Chamberland				
Date:	05-Jun-2019	**Usage Start Time:**	08:14	**Usage End Time:**	08:14
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Pro Plus
Serial Number:	18L100171	Serial Number:	11M100702
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13100C028843	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	14.10	**Standard: 240 mV**	
Bar Pres (mmHg):	749.9	Temperature (°C):	13.90
Initial O2 Saturation (%):	107.1	Initial (mV):	282.1
Initial Reading (mg/L):	11.01	Reset to (mV):	246.4
Final O2 Saturation (%):	107.1	Lot No. (240mV):	9GD822
Meter Reset to (mg/L):	11.03	Exp. Date:	01-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	20.1	20	Unknown	05-Jun-2019
100/	100	100	100	05-Jun-2019
800/	793	800	A7062	05-Jun-2019
10/Blank	10.3	10	A8221	01-Aug-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.483 mS/cmc	1.483 mS/cmc	1.483 mS/cmc	16.2 deg C	9GE117/05-01-2020
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	08:28	16.00	3.97	145.6	4.00	7GK331/11-01-2019
10.00	08:30	16.10	10.24	-193.1	10.00	7GK253/11-01-2019
7.00 Check	08:34	16.30	6.98	-23.0	N/A	7GK331/11-01-2019

Analyst Name/Signature & Date Completed: Dan Chamberland Date: 05-Jun-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Aaron Sutton				
Date:	05-Jun-2019	**Usage Start Time:**	15:32	**Usage End Time:**	15:32
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Pro Plus
Serial Number:	12L100463	Serial Number:	10D101384
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13120C029745	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	29.10	**Standard: 240 mV**	
Bar Pres (mmHg):	760.4	Temperature (°C):	20.00
Initial O2 Saturation (%):	78.1	Initial (mV):	229.4
Initial Reading (mg/L):	5.97	Reset to (mV):	238.4
Final O2 Saturation (%):	77.8	Lot No. (240mV):	9GD822
Meter Reset to (mg/L):	5.95	Exp. Date:	01-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	19.3	20	A8079	01-Mar-2020
100/	99.8	100	A6229	01-Aug-2019
800/	778	800	A8080	01-Mar-2020
10/Blank	9.5	10	A8061	01-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.52 mS/cmc	1.52 mS/cmc	1.52 mS/cmc	21.1 deg C	9GE117/05-01-2020
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

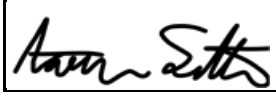
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	15:33	18.60	3.70	141.1	4.00	7GK331/11-01-2019
10.00	15:34	18.30	10.32	-194.6	10.00	7GK253/11-01-2019
7.00 Check	15:37	18.80	6.92	-28.1	N/A	7GK331/11-01-2019

Analyst Name/Signature & Date Completed: Aaron Sutton Date: 05-Jun-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Kylah wyatt				
Date:	05-Jun-2019	**Usage Start Time:**	09:38	**Usage End Time:**	15:38
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Proplus
Serial Number:	18l100171	Serial Number:	11m100702
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100q	Model:	-
Serial Number:	13100c028843	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	24.90	**Standard: 240 mV**	
Bar Pres (mmHg):	744.2	Temperature (°C):	25.70
Initial O2 Saturation (%):	97.0	Initial (mV):	207.1
Initial Reading (mg/L):	8.03	Reset to (mV):	231.0
Final O2 Saturation (%):	98.5	Lot No. (240mV):	9gd822
Meter Reset to (mg/L):	8.03	Exp. Date:	05-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	19.8	20	Unk	05-Jun-2019
100/	99.3	100	Unk	05-Jun-2019
800/	796	800	A7062	05-Jun-2019
10/Blank	9.9	-	A8221	05-Aug-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.47 mS/cmc	1.47 mS/cmc	1.47 mS/cmc	25.8 deg C	9ge117/05-05-2020
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	15:47	21.90	3.92	146.7	4.00	7gk331/11-05-2019
10.00	15:50	22.00	10.16	-194.6	10.04	7gk253/11-05-2019
7.00 Check	15:52	22.40	6.92	-21.4	N/A	7gk331/11-05-2019

Analyst Name/Signature & Date Completed: Kylah Wyatt Date: 05-Jun-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Tom Horn				
Date:	10-Jun-2019	**Usage Start Time:**	07:52	**Usage End Time:**	07:52
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Pro Plus
Serial Number:	18H100703	Serial Number:	10E100237
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Geotech	Make:	-
Model:	Portable	Model:	-
Serial Number:	18091875	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	23.40	**Standard: 240 mV**	
Bar Pres (mmHg):	756.4	Temperature (°C):	25.20
Initial O2 Saturation (%):	98.3	Initial (mV):	222.6
Initial Reading (mg/L):	8.34	Reset to (mV):	232.0
Final O2 Saturation (%):	98.3	Lot No. (240mV):	9GD822
Meter Reset to (mg/L):	8.35	Exp. Date:	01-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	20.1	20	219D	01-Sep-2019
100/	100	100	231D	01-Sep-2020
800/	803	800	-	10-Jun-2019

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.38 mS/cmc	1.38 mS/cmc	1.38 mS/cmc	21.2 deg C	9GE117/05-01-2020
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	08:10	24.00	3.87	163.5	4.00	7GK331/11-01-2019
10.00	08:11	24.20	10.10	183.4	10.00	7GK253/11-01-2019
7.00 Check	08:26	23.10	6.92	-6.9	N/A	7GK331/11-01-2019

Analyst Name/Signature & Date Completed: Tom Horn Date: 10-Jun-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Aaron Sutton				
Date:	10-Jun-2019	**Usage Start Time:**	07:47	**Usage End Time:**	08:41
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Pro Plus
Serial Number:	12L100463	Serial Number:	10D101384
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13120C029745	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	25.20	**Standard: 240 mV**	
Bar Pres (mmHg):	769.8	Temperature (°C):	23.50
Initial O2 Saturation (%):	92.8	Initial (mV):	222.2
Initial Reading (mg/L):	7.70	Reset to (mV):	233.8
Final O2 Saturation (%):	93.7	Lot No. (240mV):	9GD822
Meter Reset to (mg/L):	7.70	Exp. Date:	01-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	20.6	20	A8079	01-Mar-2020
100/	100	100	A6229	01-Aug-2019
800/	807	800	A8080	01-Mar-2020
10/Blank	9.5	10	A8061	01-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.49 mS/cmc	1.49 mS/cmc	1.49 mS/cmc	20.1 deg C	9GE117/05-01-2020
	5 Point Calibration Check (Instrument Readings within +/- 10%)			No	

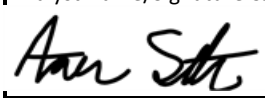
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	07:50	19.70	3.68	144.7	4.00	7GK331/11-01-2019
10.00	07:53	19.80	10.32	-192.6	10.00	7GK253/11-01-2019
7.00 Check	07:59	20.60	6.91	-26.0	N/A	7GK331/11-01-2019

Analyst Name/Signature & Date Completed: Aaron Sutton Date: 10-Jun-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Dan Chamberland				
Date:	10-Jun-2019	**Usage Start Time:**	07:53	**Usage End Time:**	07:53
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Pro plus
Serial Number:	17M100413	Serial Number:	14k100941
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100q	Model:	-
Serial Number:	13100C028843	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	27.40	**Standard: 240 mV**	
Bar Pres (mmHg):	757.3	Temperature (°C):	24.70
Initial O2 Saturation (%):	87.9	Initial (mV):	257.0
Initial Reading (mg/L):	6.86	Reset to (mV):	231.9
Final O2 Saturation (%):	89.3	Lot No. (240mV):	9GD822
Meter Reset to (mg/L):	6.79	Exp. Date:	01-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	20.3	20	Unknown	10-Jun-2019
100/	100	100	Unknown	10-Jun-2019
800/	795	800	A7602	10-Jun-2019
10/Blank	10.5	10	A8221	10-Aug-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.33 mS/cmc	1.33 mS/cmc	1.33 mS/cmc	25.4 deg C	9GE117/05-01-2020
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

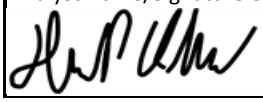
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	08:04	24.30	3.95	152.4	4.00	7GK331/06-10-2019
10.00	08:05	24.40	9.99	-187.6	10.01	7GK253/11-01-2019
7.00 Check	08:08	24.70	6.92	-13.9	7.0	7GK331/11-01-2019

Analyst Name/Signature & Date Completed: Dan Chamberland Date: 10-Jun-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Aaron Sutton				
Date:	10-Jun-2019	**Usage Start Time:**	17:30	**Usage End Time:**	17:30
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Pro Plus
Serial Number:	18H100703	Serial Number:	10E00237
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Geotech	Make:	-
Model:	Portable	Model:	-
Serial Number:	18091875	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	29.30	**Standard: 240 mV**	
Bar Pres (mmHg):	751.1	Temperature (°C):	29.90
Initial O2 Saturation (%):	97.6	Initial (mV):	221.6
Initial Reading (mg/L):	7.39	Reset to (mV):	225.8
Final O2 Saturation (%):	98.2	Lot No. (240mV):	9GD822
Meter Reset to (mg/L):	7.39	Exp. Date:	01-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	20.1	20	219d	01-Sep-2019
100/	100	100	231d	01-Sep-2020
800/	810	800	-	10-Jun-2019

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.39 mS/cmc	1.39 mS/cmc	1.39 mS/cmc	31.1 deg C	9GE117/05-01-2020
	5 Point Calibration Check (Instrument Readings within +/- 10%)			No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	17:32	31.90	3.94	167.1	4.01	7GK331/11-01-2019
10.00	17:36	32.50	10.05	-186.0	9.92	7GK253/11-01-2019
7.00 Check	17:40	31.80	6.98	-5.6	N/A	7GK331/11-01-2019

Analyst Name/Signature & Date Completed: Aaron Sutton Date: 10-Jun-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Dan Chamberland				
Date:	10-Jun-2019	**Usage Start Time:**	16:33	**Usage End Time:**	16:33
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Pro plus
Serial Number:	12L100463	Serial Number:	10D101384
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13120C029745	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	28.20	**Standard: 240 mV**	
Bar Pres (mmHg):	764.3	Temperature (°C):	28.30
Initial O2 Saturation (%):	90.0	Initial (mV):	276.5
Initial Reading (mg/L):	7.84	Reset to (mV):	227.7
Final O2 Saturation (%):	100.2	Lot No. (240mV):	9GD822
Meter Reset to (mg/L):	7.80	Exp. Date:	01-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	19.5	20	A8079	01-Mar-2020
100/	101	100	A6229	01-Aug-2019
800/	788	800	A8080	01-Mar-2020
10/Blank	9.5	10	A8061	01-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.46 mS/cmc	1.46 mS/cmc	1.46 mS/cmc	28.3 deg C	9GE117/05-01-2020
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

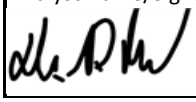
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	16:39	29.30	3.57	158.4	4.00	7GK331/11-01-2019
10.00	16:41	29.60	10.23	-184.0	10.00	7GK253/11-01-2019
7.00 Check	16:45	28.40	6.99	-14.7	N/A	7GK331/11-01-2019

Analyst Name/Signature & Date Completed: Date: 10-Jun-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Aaron Sutton				
Date:	10-Jun-2019	**Usage Start Time:**	16:46	**Usage End Time:**	16:46
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Pro Plus
Serial Number:	17M100413	Serial Number:	14K100940
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13100C028843	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	31.00	**Standard: 240 mV**	
Bar Pres (mmHg):	725.1	Temperature (°C):	31.30
Initial O2 Saturation (%):	100.0	Initial (mV):	214.2
Initial Reading (mg/L):	7.33	Reset to (mV):	223.8
Final O2 Saturation (%):	100.4	Lot No. (240mV):	9GD822
Meter Reset to (mg/L):	7.33	Exp. Date:	01-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	20	20	Unknown	10-Jun-2019
100/	100	100	Unknown	10-Jun-2019
800/	809	800	A7062	10-Jun-2019
10/Blank	9.9	10	A8221	01-Aug-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.41 mS/cmc	1.41 mS/cmc	1.41 mS/cmc	32.3 deg C	9GE117/05-01-2020
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

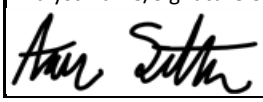
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	16:50	33.10	4.04	159.7	4.02	7GK331/11-01-2019
10.00	16:53	33.00	10.05	-192.7	9.92	7GK253/11-01-2019
7.00 Check	16:55	32.60	6.98	-14.0	N/A	7GK331/11-01-2019

Analyst Name/Signature & Date Completed: Aaron Sutton Date: 10-Jun-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Kylah wyatt				
Date:	11-Jun-2019	**Usage Start Time:**	07:40	**Usage End Time:**	07:40
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Proplus
Serial Number:	17m100413	Serial Number:	14k100940
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100q	Model:	-
Serial Number:	13100c028843	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	20.60	**Standard: 240 mV**	
Bar Pres (mmHg):	748.8	Temperature (°C):	20.90
Initial O2 Saturation (%):	105.0	Initial (mV):	231.0
Initial Reading (mg/L):	9.54	Reset to (mV):	237.3
Final O2 Saturation (%):	98.6	Lot No. (240mV):	9gd822
Meter Reset to (mg/L):	8.87	Exp. Date:	11-Jun-2019

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
10/Blank	10.1	10	A8221	01-Aug-2020
20/	20	20	Unknown	11-Jun-2019
100/	100	100	Unknown	11-Jun-2019
800/	790	800	A7062	11-Jun-2019

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.39 mS/cmc	1.39 mS/cmc	1.39 mS/cmc	21.1 deg C	9ge117/05-11-2020
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	07:45	21.90	3.96	156.1	4.00	7gk331/11-11-2019
10.00	07:50	22.20	10.11	-188.2	10.03	7gk253/11-11-2019
7.00 Check	07:53	22.50	6.96	-15.6	N/A	7gk331/11-11-2019

Analyst Name/Signature & Date Completed: Kylah Wyatt Date: 11-Jun-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Kylah wyatt				
Date:	11-Jun-2019	**Usage Start Time:**	08:32	**Usage End Time:**	08:32
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	-	Model:	Pro plus
Serial Number:	Quatro	Serial Number:	10e100237
ID Number:	18h100703	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Geotech	Make:	-
Model:	Portable turb	Model:	-
Serial Number:	18091875	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	20.10	**Standard: 240 mV**	
Bar Pres (mmHg):	748.8	Temperature (°C):	20.50
Initial O2 Saturation (%):	97.9	Initial (mV):	285.2
Initial Reading (mg/L):	8.76	Reset to (mV):	237.7
Final O2 Saturation (%):	99.4	Lot No. (240mV):	9gd822
Meter Reset to (mg/L):	8.84	Exp. Date:	11-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	20	20	219d	11-Sep-2019
100/	100	100	231d	11-Sep-2020
800/	800	800	NA	11-Jun-2019
0.0/Blank	0	0	NA	11-Jun-2019

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.4 mS/cmc	1.4 mS/cmc	1.4 mS/cmc	20.8 deg C	9ge117/05-11-2020
	5 Point Calibration Check (Instrument Readings within +/- 10%)			No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	08:34	21.80	4.00	163.0	4.00	7gk331/11-11-2019
10.00	08:37	21.60	10.04	-178.3	10.04	7gk253/11-11-2019
7.00 Check	08:40	21.90	7.00	-7.0	N/A	7gk331/11-11-2019

Analyst Name/Signature & Date Completed: Kylah Wyatt Date: 11-Jun-2019

KMW

FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Dan Chamberland				
Date:	11-Jun-2019	**Usage Start Time:**	07:52	**Usage End Time:**	07:52
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	-	Model:	-
Serial Number:	12l100463	Serial Number:	10d101384
ID Number:	Quatro	ID Number:	Pro plus

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100q	Model:	-
Serial Number:	13120c029745	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	20.60	**Standard: 240 mV**	
Bar Pres (mmHg):	761.8	Temperature (°C):	18.60
Initial O2 Saturation (%):	111.1	Initial (mV):	228.9
Initial Reading (mg/L):	10.75	Reset to (mV):	240.4
Final O2 Saturation (%):	111.8	Lot No. (240mV):	9GD822
Meter Reset to (mg/L):	10.83	Exp. Date:	01-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	20.1	20	A8079	01-Mar-2020
100/	97.9	100	A6229	01-Aug-2019
800/	803	800	A8080	01-Mar-2020
10/Blank	9.4	10	A8061	01-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.52 mS/cmc	1.52 mS/cmc	1.52 mS/cmc	17.6 deg C	9GE117/05-01-2020
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

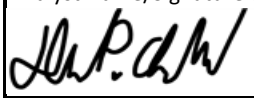
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	07:55	18.80	4.08	140.8	4.00	7GK331/11-01-2019
10.00	07:56	18.50	10.34	-195.5	10.00	7GK235/11-01-2019
7.00 Check	07:57	18.70	6.91	-28.5	N/A	7GK331/11-01-2019

Analyst Name/Signature & Date Completed: Dan Chamberland Date: 12-Jun-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Aaron Sutton				
Date:	11-Jun-2019	**Usage Start Time:**	16:47	**Usage End Time:**	16:47
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Pro Plus
Serial Number:	17M100413	Serial Number:	14K100940
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13100C028843	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	22.20	**Standard: 240 mV**	
Bar Pres (mmHg):	753.8	Temperature (°C):	22.50
Initial O2 Saturation (%):	88.7	Initial (mV):	242.8
Initial Reading (mg/L):	7.73	Reset to (mV):	235.5
Final O2 Saturation (%):	88.5	Lot No. (240mV):	9GD822
Meter Reset to (mg/L):	7.73	Exp. Date:	01-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
10/Blank	9.7	10	A8221	01-Aug-2020
20/	20.6	20	Unknown	11-Jun-2019
100/	102	100	Unknown	11-Jun-2019
800/	828	800	A7062	11-Jun-2019

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	0.94 mS/cmc	0.94 mS/cmc	0.94 mS/cmc	21.1 deg C	9GA618/01-01-2020
	5 Point Calibration Check (Instrument Readings within +/- 10%)			No	

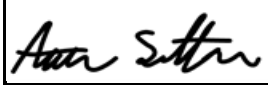
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	16:50	21.80	3.95	153.1	4.00	9GD226/04-01-2021
10.00	16:55	21.90	10.17	-194.2	10.04	9GC750/03-01-2021
7.00 Check	16:59	21.40	7.00	-22.1	N/A	9GC1183/03-01-2021

Analyst Name/Signature & Date Completed: Aaron Sutton Date: 11-Jun-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Aaron Sutton				
Date:	11-Jun-2019	**Usage Start Time:**	18:07	**Usage End Time:**	18:07
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Pro Plus
Serial Number:	18H100703	Serial Number:	10E100237
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Geotech	Make:	-
Model:	Portable	Model:	-
Serial Number:	18091875	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	27.60	**Standard: 240 mV**	
Bar Pres (mmHg):	753.5	Temperature (°C):	23.90
Initial O2 Saturation (%):	104.6	Initial (mV):	233.1
Initial Reading (mg/L):	8.19	Reset to (mV):	233.9
Final O2 Saturation (%):	105.0	Lot No. (240mV):	9GD822
Meter Reset to (mg/L):	8.20	Exp. Date:	01-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	20	20	219D	01-Sep-2019
100/	100	100	231D	01-Sep-2020
800/	804	800	Unknown	11-Jun-2019

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.02 mS/cmc	1.02 mS/cmc	1.02 mS/cmc	21.4 deg C	9GA618/01-01-2020
	5 Point Calibration Check (Instrument Readings within +/- 10%)			No	

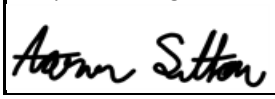
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	18:09	21.10	4.02	161.4	4.00	9GD226/04-01-2021
10.00	18:12	21.50	10.14	-184.9	10.04	9GC750/03-01-2021
7.00 Check	18:15	21.80	6.98	-11.8	N/A	9GC1183/03-01-2021

Analyst Name/Signature & Date Completed: Aaron Sutton Date: 11-Jun-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Aaron Sutton				
Date:	12-Jun-2019	**Usage Start Time:**	06:03	**Usage End Time:**	06:03
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Pro Plus
Serial Number:	17M100413	Serial Number:	14K100940
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13100C028843	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	13.70	**Standard: 240 mV**	
Bar Pres (mmHg):	758.0	Temperature (°C):	12.70
Initial O2 Saturation (%):	107.3	Initial (mV):	242.2
Initial Reading (mg/L):	11.13	Reset to (mV):	248.1
Final O2 Saturation (%):	107.2	Lot No. (240mV):	9GD822
Meter Reset to (mg/L):	11.13	Exp. Date:	01-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	19.4	20	Unknown	12-Jun-2019
100/	98.6	100	Unknown	12-Jun-2019
800/	785	800	A7062	12-Jun-2019
10/Blank	10.4	10	A8221	01-Aug-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.37 mS/cmc	1.37 mS/cmc	1.37 mS/cmc	15.5 deg C	8GI651/09-01-2019
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	06:12	15.00	3.84	151.5	4.00	9GD226/04-01-2021
10.00	06:14	14.90	10.19	-189.3	10.12	9GC750/03-01-2021
7.00 Check	06:17	14.80	7.05	-20.4	N/A	9C1183/03-01-2021

Analyst Name/Signature & Date Completed: Aaron Sutton Date: 12-Jun-2019

Aaron Sutton

FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Aaron Sutton				
Date:	12-Jun-2019	**Usage Start Time:**	06:44	**Usage End Time:**	06:44
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Pro Plus
Serial Number:	12L100463	Serial Number:	10D101384
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13120C029745	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	10.20	**Standard: 240 mV**	
Bar Pres (mmHg):	770.7	Temperature (°C):	9.90
Initial O2 Saturation (%):	117.2	Initial (mV):	228.0
Initial Reading (mg/L):	13.17	Reset to (mV):	251.6
Final O2 Saturation (%):	117.1	Lot No. (240mV):	9GD822
Meter Reset to (mg/L):	13.15	Exp. Date:	01-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	19.1	20	A8079	01-Mar-2020
100/	104	100	A6229	01-Aug-2019
800/	809	800	A8080	01-Mar-2020
10/Blank	10.5	10	A8061	01-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.3 mS/cmc	1.3 mS/cmc	1.3 mS/cmc	11.8 deg C	8GI651/09-01-2019
	5 Point Calibration Check (Instrument Readings within +/- 10%)			No	

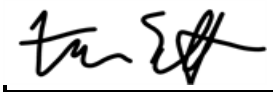
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	06:46	10.70	3.94	131.5	4.00	9GD226/04-01-2021
10.00	06:49	11.00	10.12	-189.7	10.18	9GC750/03-01-2021
7.00 Check	06:57	11.10	7.05	7.0	N/A	9GC1183/03-01-2021

Analyst Name/Signature & Date Completed: Aaron Sutton Date: 12-Jun-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Dan Chamberland				
Date:	12-Jun-2019	**Usage Start Time:**	14:08	**Usage End Time:**	14:08
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Pro plus
Serial Number:	17M100413	Serial Number:	14K100940
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	1310C028843	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	28.10	**Standard: 240 mV**	
Bar Pres (mmHg):	756.1	Temperature (°C):	22.90
Initial O2 Saturation (%):	104.6	Initial (mV):	228.5
Initial Reading (mg/L):	8.34	Reset to (mV):	234.7
Final O2 Saturation (%):	99.4	Lot No. (240mV):	9GD822
Meter Reset to (mg/L):	8.34	Exp. Date:	01-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	20.1	20	Unknown	12-Jun-2019
100/	98.7	100	Unknown	12-Jun-2019
800/	787	800	A7062	12-Jun-2019
10/Blank	9.6	10	A8221	01-Aug-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.14 mS/cmc	1.14 mS/cmc	1.13 mS/cmc	25.3 deg C	8GI1651/09-01-2019
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

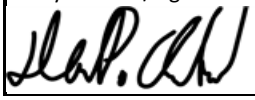
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	14:14	28.40	4.17	145.2	4.01	9GD226/04-01-2021
10.00	14:15	30.00	9.89	-194.1	9.95	9GC750/03-01-2021
7.00 Check	14:18	29.10	6.94	-20.3	N/A	9GC1183/03-01-2021

Analyst Name/Signature & Date Completed: Dan Chamberland Date: 12-Jun-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Kylah wyatt				
Date:	12-Jun-2019	**Usage Start Time:**	14:03	**Usage End Time:**	14:03
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	-	Model:	-
Serial Number:	12l100463	Serial Number:	10d101384
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100q	Model:	-
Serial Number:	13120c029745	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	19.40	**Standard: 240 mV**	
Bar Pres (mmHg):	768.6	Temperature (°C):	21.00
Initial O2 Saturation (%):	107.5	Initial (mV):	239.4
Initial Reading (mg/L):	9.54	Reset to (mV):	237.2
Final O2 Saturation (%):	107.1	Lot No. (240mV):	9gd882
Meter Reset to (mg/L):	9.50	Exp. Date:	12-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	21.2	20	A8079	12-Mar-2020
100/	95.8	100	A6229	12-Aug-2019
800/	769	800	A8080	12-Mar-2020
20/Blank	199	-	A8079	12-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.66 mS/cmc	1.66 mS/cmc	1.66 mS/cmc	17.5 deg C	9ge117/05-12-2020
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	14:06	17.10	3.61	141.5	4.00	7gk331/11-12-2019
10.00	14:07	16.20	9.75	-183.5	10.11	7gk253/11-12-2019
7.00 Check	14:13	15.80	7.04	23.0	N/A	7gk331/11-12-2019

Analyst Name/Signature & Date Completed: Kylah Wyatt Date: 12-Jun-2019

KMW

FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Kylah wyatt				
Date:	13-Jun-2019	**Usage Start Time:**	06:55	**Usage End Time:**	06:55
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Proplus
Serial Number:	17m100413	Serial Number:	14k100940
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100q	Model:	-
Serial Number:	13100c028843	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	19.20	**Standard: 240 mV**	
Bar Pres (mmHg):	752.9	Temperature (°C):	18.90
Initial O2 Saturation (%):	101.9	Initial (mV):	240.2
Initial Reading (mg/L):	9.42	Reset to (mV):	240.1
Final O2 Saturation (%):	102.0	Lot No. (240mV):	9gd822
Meter Reset to (mg/L):	9.42	Exp. Date:	13-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	19.1	20	Unk	13-Jun-2019
100/	101	100	Unk	13-Jun-2019
800/	804	800	A7062	13-Jun-2019
10/Blank	10.5	-	A8221	13-Aug-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.29 mS/cmc	1.29 mS/cmc	1.31 mS/cmc	21.1 deg C	8gi651/09-13-2019
	5 Point Calibration Check (Instrument Readings within +/- 10%)			No	

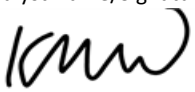
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	06:57	19.70	3.87	154.0	4.00	7gk331/11-13-2019
10.00	06:58	19.70	9.99	-187.9	10.06	7gk253/11-13-2019
7.00 Check	07:00	19.80	6.98	-18.7	N/A	7gk331/11-13-2019

Analyst Name/Signature & Date Completed: Kylah Wyatt Date: 13-Jun-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Kylah wyatt				
Date:	13-Jun-2019	**Usage Start Time:**	06:26	**Usage End Time:**	06:26
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Proplus
Serial Number:	18h100703	Serial Number:	10e100237
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100q	Model:	-
Serial Number:	13120c029745	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	19.30	**Standard: 240 mV**	
Bar Pres (mmHg):	752.2	Temperature (°C):	19.10
Initial O2 Saturation (%):	93.8	Initial (mV):	241.5
Initial Reading (mg/L):	8.42	Reset to (mV):	239.5
Final O2 Saturation (%):	92.5	Lot No. (240mV):	9gd822
Meter Reset to (mg/L):	8.35	Exp. Date:	13-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	14.7	20	A8079	13-Mar-2020
100/	85.2	100	A6229	13-Aug-2019
800/	709	800	A8080	13-Mar-2020
10/Blank	10.7	-	8061	13-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.37 mS/cmc	1.37 mS/cmc	1.37 mS/cmc	20.6 deg C	9ge117/05-13-2020
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	06:28	20.20	3.88	161.6	4.00	7gk331/11-13-2019
10.00	06:31	19.90	10.01	-182.1	10.06	7gk253/11-13-2019
7.00 Check	06:33	20.00	6.92	-8.2	N/A	7gk331/11-13-2019

Analyst Name/Signature & Date Completed: Kylah Wyatt Date: 13-Jun-2019

KyW

FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Dan Chamberland				
Date:	13-Jun-2019	**Usage Start Time:**	14:25	**Usage End Time:**	14:25
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Pro Plus
Serial Number:	17M100413	Serial Number:	14K100940
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13120C029745	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	20.00	**Standard: 240 mV**	
Bar Pres (mmHg):	749.1	Temperature (°C):	17.80
Initial O2 Saturation (%):	95.9	Initial (mV):	251.4
Initial Reading (mg/L):	9.39	Reset to (mV):	241.1
Final O2 Saturation (%):	98.6	Lot No. (240mV):	9GD822
Meter Reset to (mg/L):	9.38	Exp. Date:	01-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	27.3	20	A8079	01-Mar-2020
100/	126	100	A6229	01-Aug-2019
800/	948	800	A8080	01-Mar-2020
10/Blank	9.4	10	A8061	01-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.19 mS/cmc	1.19 mS/cmc	1.41 mS/cmc	19.1 deg C	8GI651/09-01-2019
	5 Point Calibration Check (Instrument Readings within +/- 10%)			No	

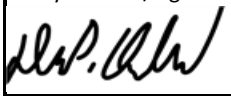
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	14:30	17.40	4.14	144.3	4.00	9GD226/04-01-2021
10.00	14:34	17.60	10.02	-192.5	10.00	9GC750/03-01-2021
7.00 Check	14:37	17.30	6.95	-20.5	N/A	9GC1183/03-21-2021

Analyst Name/Signature & Date Completed: Dan Chamberland Date: 13-Jun-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Aaron Sutton				
Date:	13-Jun-2019	**Usage Start Time:**	14:45	**Usage End Time:**	14:45
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Pro Plus
Serial Number:	18H100703	Serial Number:	10E100237
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13100C028843	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	20.40	**Standard: 240 mV**	
Bar Pres (mmHg):	748.1	Temperature (°C):	19.00
Initial O2 Saturation (%):	76.0	Initial (mV):	242.5
Initial Reading (mg/L):	6.68	Reset to (mV):	239.7
Final O2 Saturation (%):	74.7	Lot No. (240mV):	9GD822
Meter Reset to (mg/L):	6.67	Exp. Date:	01-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	19.5	20	Unknown	13-Jun-2019
100/	99.8	100	Unknown	13-Jun-2019
800/	830	800	A7062	13-Jun-2019
10/Blank	9.9	10	A8221	01-Aug-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.33 mS/cmc	1.33 mS/cmc	1.33 mS/cmc	19.5 deg C	8GI651/09-01-2019
	5 Point Calibration Check (Instrument Readings within +/- 10%)			No	

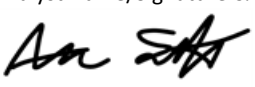
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	14:48	18.10	4.02	159.9	4.00	9GD226/04-01-2021
10.00	14:49	18.40	10.11	-184.7	10.08	9GC750/03-01-2021
7.00 Check	14:54	18.80	7.03	-12.6	N/A	9GC1183/03-01-2021

Analyst Name/Signature & Date Completed: Aaron Sutton Date: 13-Jun-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Dan Chamberland				
Date:	14-Jun-2019	**Usage Start Time:**	06:51	**Usage End Time:**	06:51
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Pro plus
Serial Number:	17M100413	Serial Number:	14K100940
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13120C029745	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	16.50	**Standard: 240 mV**	
Bar Pres (mmHg):	745.1	Temperature (°C):	15.90
Initial O2 Saturation (%):	105.1	Initial (mV):	249.4
Initial Reading (mg/L):	10.28	Reset to (mV):	243.8
Final O2 Saturation (%):	105.4	Lot No. (240mV):	8GD922
Meter Reset to (mg/L):	10.29	Exp. Date:	01-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	23.3	20	A8079	01-Mar-2020
100/	105	100	A6229	01-Aug-2019
800/	793	800	A8080	01-Mar-2020
10/Blank	9.8	10	A8061	01-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.36 mS/cmc	1.36 mS/cmc	1.36 mS/cmc	16.2 deg C	8GI651/09-01-2019
	5 Point Calibration Check (Instrument Readings within +/- 10%)			No	

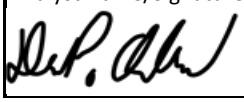
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	06:53	15.60	3.93	152.6	4.00	9GD303/02-01-2021
10.00	06:55	15.60	10.12	-189.9	10.11	9GC750/03-01-2021
7.00 Check	06:58	15.80	7.07	-20.7	N/A	9GC1183/03-01-2021

Analyst Name/Signature & Date Completed: Dan Chamberland Date: 14-Jun-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Dan Chamberland				
Date:	14-Jun-2019	**Usage Start Time:**	06:24	**Usage End Time:**	06:24
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Pro plus
Serial Number:	18H100703	Serial Number:	10E100237
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100q	Model:	-
Serial Number:	13100C028843	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	17.10	**Standard: 240 mV**	
Bar Pres (mmHg):	744.3	Temperature (°C):	15.30
Initial O2 Saturation (%):	94.7	Initial (mV):	242.9
Initial Reading (mg/L):	9.73	Reset to (mV):	244.6
Final O2 Saturation (%):	99.9	Lot No. (240mV):	9GD822
Meter Reset to (mg/L):	9.72	Exp. Date:	01-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	18.9	20	Unknown	14-Jun-2019
100/	101	100	Unknown	14-Jun-2019
800/	791	800	A7062	14-Jun-2019
10/Blank	9.3	-	A8221	01-Aug-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.14 mS/cmc	1.14 mS/cmc	1.14 mS/cmc	16.1 deg C	8GI651/09-01-2019
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

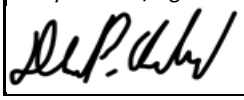
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	06:26	15.50	3.99	157.1	4.00	12101017/02-01-2021
10.00	06:27	15.30	10.12	-184.7	10.12	12101019/03-01-2021
7.00 Check	06:30	15.40	7.07	-14.4	N/A	9GC1183/03-01-2021

Analyst Name/Signature & Date Completed: Dan Chamberland Date: 14-Jun-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Kylah Wyatt				
Date:	14-Jun-2019	**Usage Start Time:**	15:56	**Usage End Time:**	15:56
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Proplus
Serial Number:	17m100413	Serial Number:	14k100940
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100q	Model:	-
Serial Number:	13120c029745	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	19.10	**Standard: 240 mV**	
Bar Pres (mmHg):	747.7	Temperature (°C):	20.00
Initial O2 Saturation (%):	98.8	Initial (mV):	224.2
Initial Reading (mg/L):	8.95	Reset to (mV):	238.4
Final O2 Saturation (%):	94.2	Lot No. (240mV):	9gd822
Meter Reset to (mg/L):	8.65	Exp. Date:	14-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	20.1	20	A8079	14-Mar-2020
100/	94.7	1900	A6229	14-Aug-2019
800/	801	800	A8080	14-Mar-2020
10/Blank	9.4	-	A8061	14-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.87 mS/cmc	1.87 mS/cmc	1.87 mS/cmc	18.9 deg C	8gi651/09-14-2019
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	15:59	19.10	4.00	152.2	4.00	9gb303/02-14-2021
10.00	16:03	19.40	9.83	-181.3	10.07	9gc750/03-14-2021
7.00 Check	16:05	19.40	7.09	-22.6	N/A	9gc1183/03-14-2021

Analyst Name/Signature & Date Completed: Kylah Wyatt Date: 14-Jun-2019

KWW

FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Kylah Wyatt				
Date:	14-Jun-2019	**Usage Start Time:**	16:28	**Usage End Time:**	16:28
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Proplus
Serial Number:	18h100703	Serial Number:	10e100237
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100q	Model:	-
Serial Number:	13100c028843	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	20.20	**Standard: 240 mV**	
Bar Pres (mmHg):	747.0	Temperature (°C):	20.30
Initial O2 Saturation (%):	101.7	Initial (mV):	243.5
Initial Reading (mg/L):	9.07	Reset to (mV):	238.1
Final O2 Saturation (%):	102.9	Lot No. (240mV):	9gd822
Meter Reset to (mg/L):	9.12	Exp. Date:	14-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	20.8	20	Unk	14-Jun-2019
100/	97.2	100	Unk	14-Jun-2019
800/	754	800	A7062	14-Jun-2019
10/	9.1	-	A8221	14-Aug-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.44 mS/cmc	1.44 mS/cmc	1.44 mS/cmc	18.2 deg C	8gi651/09-14-2019
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	16:30	19.80	4.00	158.2	4.00	9gb303/06-14-2019
10.00	16:31	19.80	10.01	-182.8	10.06	9gc750/03-14-2021
7.00 Check	16:34	19.80	7.02	-18.1	N/A	9gc1183/03-14-2021

Analyst Name/Signature & Date Completed: Kylah Wyatt Date: 14-Jun-2019

KW

FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Aaron Sutton				
Date:	15-Jun-2019	**Usage Start Time:**	06:25	**Usage End Time:**	06:25
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Pro Plus
Serial Number:	17M100413	Serial Number:	14K100940
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13120C029745	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	16.00	**Standard: 240 mV**	
Bar Pres (mmHg):	753.4	Temperature (°C):	15.60
Initial O2 Saturation (%):	107.7	Initial (mV):	245.2
Initial Reading (mg/L):	10.63	Reset to (mV):	244.4
Final O2 Saturation (%):	107.7	Lot No. (240mV):	9GD822
Meter Reset to (mg/L):	10.64	Exp. Date:	01-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	20.3	20	A8079	01-Mar-2020
100/	105	100	A6229	01-Aug-2019
800/	831	800	A8080	01-Mar-2020
10/Blank	9.8	10	A8061	01-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.65 mS/cmc	1.65 mS/cmc	1.65 mS/cmc	15.7 deg C	8GI651/09-01-2019
	5 Point Calibration Check (Instrument Readings within +/- 10%)			No	

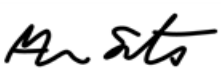
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	06:31	15.50	3.95	151.3	4.00	9GB303/02-01-2021
10.00	06:32	15.30	10.17	-189.5	10.12	9GC750/03-01-2021
7.00 Check	06:34	15.10	7.06	-20.9	N/A	9GD245/04-01-2021

Analyst Name/Signature & Date Completed: Aaron Sutton Date: 15-Jun-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Kylah Wyatt				
Date:	15-Jun-2019	**Usage Start Time:**	13:25	**Usage End Time:**	13:25
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	-	Model:	Proplus
Serial Number:	Quatro	Serial Number:	14k100940
ID Number:	17m100413	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2109q	Model:	-
Serial Number:	13120c029475	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	26.70	**Standard: 240 mV**	
Bar Pres (mmHg):	749.5	Temperature (°C):	24.70
Initial O2 Saturation (%):	82.2	Initial (mV):	222.6
Initial Reading (mg/L):	6.82	Reset to (mV):	225.2
Final O2 Saturation (%):	98.0	Lot No. (240mV):	9gd822
Meter Reset to (mg/L):	8.16	Exp. Date:	15-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	20.2	20	A8079	15-Mar-2020
100/	97.5	100	A6229	15-Aug-2019
800/	742	800	A8080	15-Mar-2020
10/Blank	9.2	-	A8061	15-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.85 mS/cmc	1.85 mS/cmc	1.85 mS/cmc	21.2 deg C	8gi651/09-15-2019
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	13:28	22.80	3.97	153.3	4.00	7gk331/11-15-2019
10.00	13:33	22.50	9.97	-185.9	10.03	7gk253/11-15-2019
7.00 Check	13:34	22.40	7.00	-17.9	N/A	7gk331/11-15-2019

Analyst Name/Signature & Date Completed: Kylah Wyatt Date: 15-Jun-2019

KM W

FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Kylah Wyatt				
Date:	16-Jun-2019	**Usage Start Time:**	06:07	**Usage End Time:**	07:07
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Proplus
Serial Number:	12l100463	Serial Number:	10d101384
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100q	Model:	-
Serial Number:	13100c028843	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	14.90	**Standard: 240 mV**	
Bar Pres (mmHg):	762.9	Temperature (°C):	14.90
Initial O2 Saturation (%):	111.6	Initial (mV):	247.5
Initial Reading (mg/L):	11.31	Reset to (mV):	245.3
Final O2 Saturation (%):	115.2	Lot No. (240mV):	9gd822
Meter Reset to (mg/L):	11.89	Exp. Date:	16-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	14.1	20	Unk	16-Jun-2019
100/	101	100	Unk	16-Jun-2019
800/	823	800	A7062	16-Jun-2019
10/Blank	9.5	-	A8221	16-Aug-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.63 mS/cmc	1.63 mS/cmc	1.63 mS/cmc	15.8 deg C	8gi651/09-16-2019
	5 Point Calibration Check (Instrument Readings within +/- 10%)			No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	07:42	15.30	3.96	143.7	4.00	9gb303/02-16-2021
10.00	07:43	15.50	9.58	-157.2	10.12	9gc750/03-16-2021
7.00 Check	07:43	15.50	7.01	-57.5	N/A	9gd245/04-16-2021

Analyst Name/Signature & Date Completed: Kylah Wyatt Date: 16-Jun-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Kylah Wyatt				
Date:	16-Jun-2019	**Usage Start Time:**	06:02	**Usage End Time:**	06:55
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Proplus
Serial Number:	17m100413	Serial Number:	14k100940
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100q	Model:	-
Serial Number:	13120c029745	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	185.00	**Standard: 240 mV**	
Bar Pres (mmHg):	750.2	Temperature (°C):	18.20
Initial O2 Saturation (%):	104.7	Initial (mV):	236.5
Initial Reading (mg/L):	9.84	Reset to (mV):	240.8
Final O2 Saturation (%):	107.4	Lot No. (240mV):	9gd822
Meter Reset to (mg/L):	10.03	Exp. Date:	16-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	14.8	20	A8079	16-Mar-2020
100/	109	100	A6229	16-Aug-2019
800/	828	800	A8080	16-Mar-2020
10/Blank	12.8	10	A8061	16-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.93 mS/cmc	1.93 mS/cmc	1.93 mS/cmc	19.4 deg C	8gi651/09-16-2019
	5 Point Calibration Check (Instrument Readings within +/- 10%)			No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	06:57	19.10	3.96	153.4	4.00	9gb303/02-16-2021
10.00	06:58	18.70	10.00	-183.2	10.08	9gc750/03-16-2021
7.00 Check	06:59	19.10	7.03	-30.0	N/A	9gd245/04-16-2021

Analyst Name/Signature & Date Completed: Kylah Wyatt Date: 16-Jun-2019

KW

FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Aaron Sutton				
Date:	16-Jun-2019	**Usage Start Time:**	17:15	**Usage End Time:**	17:15
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Pro Plus
Serial Number:	17M100413	Serial Number:	14K100940
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13100C028843	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	24.00	**Standard: 240 mV**	
Bar Pres (mmHg):	750.2	Temperature (°C):	24.30
Initial O2 Saturation (%):	101.2	Initial (mV):	236.1
Initial Reading (mg/L):	8.54	Reset to (mV):	233.0
Final O2 Saturation (%):	101.7	Lot No. (240mV):	9GD822
Meter Reset to (mg/L):	8.55	Exp. Date:	01-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	26.2	20	Unknown	16-Jun-2019
100/	102	100	Unknown	16-Jun-2019
800/	786	800	A7062	16-Jun-2019
10/Blank	10.7	-	A8221	01-Aug-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.67 mS/cmc	1.67 mS/cmc	1.67 mS/cmc	26 deg C	89I651/09-01-2019
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	17:20	28.00	4.10	150.4	4.01	7GK331/11-01-2019
10.00	17:22	27.40	10.00	-193.8	9.97	7GK253/11-01-2019
7.00 Check	17:25	27.20	6.91	-17.3	N/A	7GK331/11-01-2019

Analyst Name/Signature & Date Completed: Aaron Sutton Date: 16-Jun-2019

Aaron Sutton

FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Kylah Wyatt				
Date:	17-Jun-2019	**Usage Start Time:**	06:58	**Usage End Time:**	06:58
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Proplus
Serial Number:	12L100463	Serial Number:	10d101384
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2109q	Model:	-
Serial Number:	13100c028843	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	11.50	**Standard: 240 mV**	
Bar Pres (mmHg):	766.4	Temperature (°C):	11.60
Initial O2 Saturation (%):	112.2	Initial (mV):	260.8
Initial Reading (mg/L):	12.21	Reset to (mV):	249.4
Final O2 Saturation (%):	112.2	Lot No. (240mV):	9GD822
Meter Reset to (mg/L):	12.21	Exp. Date:	01-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	20.6	20	-	17-Jun-2019
100/	93.5	100	-	17-Jun-2019
800/	801	800	A7062	17-Jun-2019
10/	9.7	-	A8221	17-Aug-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.46 mS/cmc	1.46 mS/cmc	1.46 mS/cmc	12.9 deg C	8gi651/09-17-2019
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	07:00	12.20	3.80	143.3	4.00	7gk331/11-17-2019
10.00	07:02	11.80	9.92	-170.7	10.16	7gk253/11-17-2019
7.00 Check	07:05	11.80	7.06	-40.5	N/A	7gk331/11-17-2019

Analyst Name/Signature & Date Completed: Kylah Wyatt Date: 17-Jun-2019

KWW

FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Kylah wyatt				
Date:	17-Jun-2019	**Usage Start Time:**	15:44	**Usage End Time:**	15:44
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Proplus
Serial Number:	12l100463	Serial Number:	10d101384
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100q	Model:	-
Serial Number:	13100c028843	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	20.00	**Standard: 240 mV**	
Bar Pres (mmHg):	766.0	Temperature (°C):	21.80
Initial O2 Saturation (%):	106.8	Initial (mV):	231.5
Initial Reading (mg/L):	9.48	Reset to (mV):	236.0
Final O2 Saturation (%):	104.0	Lot No. (240mV):	9gd822
Meter Reset to (mg/L):	9.26	Exp. Date:	17-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	18	20	Unk	17-Jun-2019
100/	103	100	Unk	17-Jun-2019
800/	791	800	A7062	17-Jun-2019
10/Blank	10.9	-	A8221	17-Aug-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.67 mS/cmc	1.67 mS/cmc	1.67 mS/cmc	20.3 deg C	8gi651/09-17-2019
5 Point Calibration Check (Instrument Readings within +/- 10%)				Yes	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	15:47	21.30	4.36	123.7	4.00	7gk331/11-17-2019
10.00	15:50	21.50	10.06	-176.2	10.00	7gk253/11-17-2019
7.00 Check	15:53	21.10	7.02	-27.3	N/A	7gk331/11-17-2019

Analyst Name/Signature & Date Completed: Kylah Wyatt Date: 17-Jun-2019

KMW

FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Dan chamberland				
Date:	18-Jun-2019	**Usage Start Time:**	06:11	**Usage End Time:**	06:11
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Pro plus
Serial Number:	12L100463	Serial Number:	10D101384
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13100C028843	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	19.30	**Standard: 240 mV**	
Bar Pres (mmHg):	766.2	Temperature (°C):	15.60
Initial O2 Saturation (%):	102.6	Initial (mV):	269.8
Initial Reading (mg/L):	10.30	Reset to (mV):	244.2
Final O2 Saturation (%):	100.9	Lot No. (240mV):	9GD822
Meter Reset to (mg/L):	10.31	Exp. Date:	01-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	21.5	20	Unknown	18-Jun-2019
100/	104	100	Unknown	18-Jun-2019
800/	817	800	A7062	18-Jun-2019
10/Blank	9.8	-	A8221	01-Aug-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.24 mS/cmc	1.24 mS/cmc	1.24 mS/cmc	15.4 deg C	8GI651/09-01-2019
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	06:15	15.00	3.88	129.1	4.00	9GB303/02-01-2021
10.12	06:18	15.20	10.62	-197.0	10.00	9GD483/04-01-2021
7.00 Check	06:23	15.10	6.93	-40.0	N/A	9GC1183/03-01-2021

Analyst Name/Signature & Date Completed: Dan Chamberland Date: 18-Jun-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Dan Chamberland				
Date:	18-Jun-2019	**Usage Start Time:**	06:39	**Usage End Time:**	06:39
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Pro plus
Serial Number:	17M100413	Serial Number:	14K100940
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	-	Model:	-
Serial Number:	13120C029745	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	18.00	**Standard: 240 mV**	
Bar Pres (mmHg):	753.5	Temperature (°C):	18.10
Initial O2 Saturation (%):	104.7	Initial (mV):	257.6
Initial Reading (mg/L):	9.38	Reset to (mV):	241.0
Final O2 Saturation (%):	99.1	Lot No. (240mV):	9GD822
Meter Reset to (mg/L):	9.38	Exp. Date:	01-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	26.1	20	A8079	01-Mar-2020
100/	97	100	A6229	01-Aug-2019
800/	802	800	A8080	01-Mar-2020
10/Blank	9.9	10	A8061	01-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.45 mS/cmc	1.45 mS/cmc	1.45 mS/cmc	18.8 deg C	8GI651/09-01-2019
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

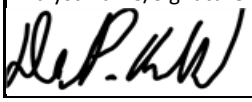
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	06:42	18.50	3.88	151.6	4.00	9GB303/06-18-2019
10.00	06:43	18.80	10.18	-193.4	10.07	9GD483/04-01-2021
7.00 Check	06:50	18.70	6.98	-19.1	N/A	9GC1183/03-01-2021

Analyst Name/Signature & Date Completed: Dan Chamberland Date: 18-Jun-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Kylah Wyatt				
Date:	18-Jun-2019	**Usage Start Time:**	16:14	**Usage End Time:**	16:14
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	ProPlus
Serial Number:	12l100463	Serial Number:	10d101384
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100q	Model:	-
Serial Number:	13100c028843	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	23.30	**Standard: 240 mV**	
Bar Pres (mmHg):	763.1	Temperature (°C):	24.40
Initial O2 Saturation (%):	95.3	Initial (mV):	201.5
Initial Reading (mg/L):	8.09	Reset to (mV):	232.6
Final O2 Saturation (%):	96.4	Lot No. (240mV):	9gd822
Meter Reset to (mg/L):	8.10	Exp. Date:	18-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	18.9	20	-	18-Jun-2019
100/	102	100	-	18-Jun-2019
800/	791	800	A7062	18-Jun-2019
10/	10.5	-	A8221	18-Aug-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.69 mS/cmc	1.69 mS/cmc	1.69 mS/cmc	23.6 deg C	8gi651/09-18-2019
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	16:27	29.00	3.46	139.4	4.01	7gk331/11-18-2019
10.00	16:28	27.90	9.84	-190.5	10.00	7gk253/11-18-2019
7.00 Check	16:30	29.40	7.02	-41.7	N/A	7gk331/11-18-2019

Analyst Name/Signature & Date Completed: Kylah Wyatt Date: 18-Jun-2019

KMW

FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Kylah Wyatt				
Date:	18-Jun-2019	**Usage Start Time:**	16:38	**Usage End Time:**	16:38
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	ProPlus
Serial Number:	17m100413	Serial Number:	14k100940
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100q	Model:	-
Serial Number:	13120c029745	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	26.90	**Standard: 240 mV**	
Bar Pres (mmHg):	750.4	Temperature (°C):	27.30
Initial O2 Saturation (%):	95.4	Initial (mV):	214.1
Initial Reading (mg/L):	7.47	Reset to (mV):	229.8
Final O2 Saturation (%):	97.5	Lot No. (240mV):	9gd822
Meter Reset to (mg/L):	7.60	Exp. Date:	18-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	20	20	A8079	18-Mar-2020
100/	94.6	100	A6229	18-Aug-2019
800/	785	800	A8080	18-Mar-2020
10/Blank	9.1	-	A8061	18-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.88 mS/cmc	1.88 mS/cmc	1.88 mS/cmc	27.2 deg C	8gi651/09-18-2019
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

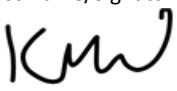
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	16:46	31.20	3.91	159.5	4.01	7gk331/11-18-2019
10.00	16:48	30.10	9.72	-180.4	9.94	7gk253/11-18-2019
7.00 Check	16:51	30.70	6.99	-12.7	N/A	7gk331/11-18-2019

Analyst Name/Signature & Date Completed: Kylah Wyatt Date: 18-Jun-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Aaron Sutton				
Date:	19-Jun-2019	**Usage Start Time:**	07:27	**Usage End Time:**	07:27
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Pro Plus
Serial Number:	17M100413	Serial Number:	14K100940
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13120C029745	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	21.50	**Standard: 240 mV**	
Bar Pres (mmHg):	749.7	Temperature (°C):	20.90
Initial O2 Saturation (%):	83.0	Initial (mV):	241.1
Initial Reading (mg/L):	7.31	Reset to (mV):	237.3
Final O2 Saturation (%):	82.7	Lot No. (240mV):	9GD822
Meter Reset to (mg/L):	7.31	Exp. Date:	01-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	21.3	20	A8079	01-Mar-2020
100/	104	100	A6229	01-Aug-2019
800/	808	800	A8080	01-Mar-2020
10/Blank	9.1	-	A8061	01-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.66 mS/cmc	1.66 mS/cmc	1.66 mS/cmc	21.1 deg C	8GI651/09-01-2019
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

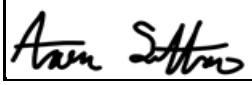
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	07:33	20.50	4.00	155.4	4.00	9GB303/02-01-2021
10.00	07:36	20.60	10.13	-187.7	10.05	9GC750/03-01-2021
7.00 Check	07:38	20.60	7.05	-20.3	N/A	9GD245/04-01-2021

Analyst Name/Signature & Date Completed: Aaron Sutton Date: 19-Jun-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Kylah Wyatt				
Date:	19-Jun-2019	**Usage Start Time:**	14:49	**Usage End Time:**	14:49
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	ProPlus
Serial Number:	17m100413	Serial Number:	14k100940
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100q	Model:	-
Serial Number:	13120c029745	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	29.20	**Standard: 240 mV**	
Bar Pres (mmHg):	747.2	Temperature (°C):	29.30
Initial O2 Saturation (%):	98.1	Initial (mV):	215.5
Initial Reading (mg/L):	7.49	Reset to (mV):	226.7
Final O2 Saturation (%):	98.0	Lot No. (240mV):	9gd822
Meter Reset to (mg/L):	7.49	Exp. Date:	19-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	18.5	20	A8079	19-Mar-2020
100/	102	100	A6229	19-Aug-2019
800/	804	800	A8080	19-Mar-2019
10/Blank	9.4	10	A8061	19-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1 mS/cmc	1 mS/cmc	1 mS/cmc	25 deg C	8gi651/09-19-2019
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	14:59	31.50	3.96	159.1	4.00	7gk331/11-19-2019
10.00	15:00	31.10	9.91	-187.1	9.93	7gk253/11-19-2019
7.00 Check	15:03	31.00	6.95	-13.9	N/A	7gk331/11-19-2019

Analyst Name/Signature & Date Completed: Kylah Wyatt Date: 19-Jun-2019

KW

FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Kylah Wyatt				
Date:	24-Jun-2019	**Usage Start Time:**	06:56	**Usage End Time:**	06:56
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	ProPlus
Serial Number:	12l100463	Serial Number:	10d101384
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100q	Model:	-
Serial Number:	13120c029745	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	15.30	**Standard: 240 mV**	
Bar Pres (mmHg):	763.2	Temperature (°C):	14.20
Initial O2 Saturation (%):	110.2	Initial (mV):	246.9
Initial Reading (mg/L):	11.01	Reset to (mV):	246.0
Final O2 Saturation (%):	109.1	Lot No. (240mV):	9gd822
Meter Reset to (mg/L):	11.09	Exp. Date:	24-Jan-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	19.1	20	A8079	24-Mar-2020
100/	102	100	A6229	24-Aug-2019
800/	800	800	A8080	24-Mar-2020
10/Blank	9.9	10	A8061	24-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.71 mS/cmc	1.71 mS/cmc	1.71 mS/cmc	16.2 deg C	8gi651/09-24-2019
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	07:08	15.20	3.75	142.2	4.00	9gb303/02-24-2021
10.00	07:10	15.20	9.53	-160.3	10.12	9gd483/04-24-2021
7.00 Check	07:13	14.80	7.02	-32.4	N/A	7gk331/11-24-2019

Analyst Name/Signature & Date Completed: Kylah wyatt Date: 24-Jun-2019

KW

FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Kylah Wyatt				
Date:	24-Jun-2019	**Usage Start Time:**	15:49	**Usage End Time:**	15:49
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	ProPlus
Serial Number:	12l100463	Serial Number:	10d101384
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2109q	Model:	-
Serial Number:	13120c029745	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	20.50	**Standard: 240 mV**	
Bar Pres (mmHg):	762.1	Temperature (°C):	23.60
Initial O2 Saturation (%):	104.9	Initial (mV):	220.1
Initial Reading (mg/L):	9.26	Reset to (mV):	233.8
Final O2 Saturation (%):	99.4	Lot No. (240mV):	9ge1169
Meter Reset to (mg/L):	8.51	Exp. Date:	24-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	20.7	20	A8079	24-Mar-2020
100/	98.2	100	A6229	24-Aug-2019
800/	778	800	A8080	24-Mar-2020
10/Blank	9.7	-	A8061	24-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.63 mS/cmc	1.63 mS/cmc	1.63 mS/cmc	22.6 deg C	8gi651/09-24-2019
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

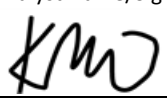
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	15:57	23.00	4.45	116.7	4.00	9gb303/02-24-2021
10.00	16:01	22.90	9.99	-1795.2	10.02	9gd483/04-24-2021
7.00 Check	16:02	22.90	7.01	-32.1	N/A	9gc1183/03-24-2021

Analyst Name/Signature & Date Completed: Kylah Wyatt Date: 24-Jun-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Kylah Wyatt				
Date:	25-Jun-2019	**Usage Start Time:**	07:04	**Usage End Time:**	07:04
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	ProPlus
Serial Number:	12l100463	Serial Number:	10d101384
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100q	Model:	-
Serial Number:	13120c029745	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	16.00	**Standard: 240 mV**	
Bar Pres (mmHg):	761.1	Temperature (°C):	16.50
Initial O2 Saturation (%):	102.3	Initial (mV):	238.7
Initial Reading (mg/L):	10.23	Reset to (mV):	243.1
Final O2 Saturation (%):	10.4	Lot No. (240mV):	9ge1169
Meter Reset to (mg/L):	10.49	Exp. Date:	25-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	20.3	20	A8079	25-Mar-2020
100/	98.9	100	A6229	25-Aug-2019
800/	827	800	A8080	25-Jun-2019
10/	9.6	10	A8061	25-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.61 mS/cmc	1.61 mS/cmc	1.61 mS/cmc	16.5 deg C	8gi651/09-25-2019
	5 Point Calibration Check (Instrument Readings within +/- 10%)			No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	07:17	16.20	3.75	124.8	4.00	9gb303/02-25-2021
10.00	07:18	16.50	10.12	-170.9	10.10	/06-25-2019
7.00 Check	07:25	7.41	7.04	-45.4	N/A	9gd245/04-25-2021

Analyst Name/Signature & Date Completed: Kylah Wyatt Date: 25-Jun-2019

KW

FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Kylah Wyatt				
Date:	25-Jun-2019	**Usage Start Time:**	11:25	**Usage End Time:**	11:25
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	ProPlus
Serial Number:	12l100453	Serial Number:	10d101384
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100q	Model:	-
Serial Number:	13120c029745	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	16.20	**Standard: 240 mV**	
Bar Pres (mmHg):	761.0	Temperature (°C):	16.20
Initial O2 Saturation (%):	103.7	Initial (mV):	239.6
Initial Reading (mg/L):	10.22	Reset to (mV):	243.4
Final O2 Saturation (%):	103.8	Lot No. (240mV):	9ge1169
Meter Reset to (mg/L):	10.18	Exp. Date:	25-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	19.5	20	A8079	25-Mar-2020
100/	99.9	100	A6229	25-Aug-2019
800/	773	800	A8080	25-Mar-2020
10/	10.2	-	A8061	25-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.7 mS/cmc	1.7 mS/cmc	1.71 mS/cmc	16.3 deg C	8gi651/09-25-2019
	5 Point Calibration Check (Instrument Readings within +/- 10%)			No	

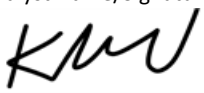
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	11:27	16.50	4.30	105.1	4.00	9gd226/04-25-2021
10.00	11:33	16.60	9.44	-163.4	10.10	9gd483/06-25-2019
7.00 Check	11:35	16.80	7.04	-40.5	N/A	9gd245/04-25-2021

Analyst Name/Signature & Date Completed: Kylah Wyatt Date: 25-Jun-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Kylah Wyatt				
Date:	26-Jun-2019	**Usage Start Time:**	06:49	**Usage End Time:**	06:49
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	ProPlus
Serial Number:	12l100463	Serial Number:	10d101384
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100q	Model:	-
Serial Number:	13120c029745	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	16.40	**Standard: 240 mV**	
Bar Pres (mmHg):	766.3	Temperature (°C):	16.50
Initial O2 Saturation (%):	107.0	Initial (mV):	250.1
Initial Reading (mg/L):	10.40	Reset to (mV):	243.1
Final O2 Saturation (%):	105.5	Lot No. (240mV):	9ge1169
Meter Reset to (mg/L):	10.32	Exp. Date:	26-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	19	20	A8078	26-Mar-2020
100/	98.1	108	A6229	26-Aug-2019
800/	823	800	A8080	26-Mar-2020
10/Blank	11	-	A8061	26-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.71 mS/cmc	1.71 mS/cmc	1.71 mS/cmc	17.3 deg C	8gi651/09-26-2019
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	07:01	17.00	4.16	117.8	4.00	9gd226/04-26-2021
10.00	07:02	17.50	9.23	-151.6	10.09	9gd483/04-26-2021
7.00 Check	07:05	17.10	7.01	-	N/A	9gd245/04-26-2021

Analyst Name/Signature & Date Completed: Kylah Wyatt Date: 26-Jun-2019

KMW

FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Kylah Wyatt				
Date:	27-Jun-2019	**Usage Start Time:**	06:50	**Usage End Time:**	06:50
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	ProPlus
Serial Number:	12l100463	Serial Number:	10d101384
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100q	Model:	-
Serial Number:	13120c029745	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	17.00	**Standard: 240 mV**	
Bar Pres (mmHg):	768.7	Temperature (°C):	16.90
Initial O2 Saturation (%):	103.7	Initial (mV):	241.2
Initial Reading (mg/L):	10.03	Reset to (mV):	242.5
Final O2 Saturation (%):	104.9	Lot No. (240mV):	9ge1169
Meter Reset to (mg/L):	10.10	Exp. Date:	27-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	21.5	20	A8079	27-Mar-2020
100/	99.7	100	A6229	27-Aug-2019
800/	788	800	A8080	27-Mar-2020
10/Blank	9.7	-	A8061	27-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.73 mS/cmc	1.73 mS/cmc	1.73 mS/cmc	17.4 deg C	8gi651/09-27-2019
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	06:57	17.90	3.75	120.5	4.00	9gd226/04-27-2021
10.00	06:59	17.90	10.37	-101.1	10.09	9gd483/04-27-2021
7.00 Check	07:03	17.50	7.00	-37.4	N/A	9gd245/04-27-2021

Analyst Name/Signature & Date Completed: Kylah wyatt Date: 27-Jun-2019

KW

FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Kylah Wyatt				
Date:	27-Jun-2019	**Usage Start Time:**	08:52	**Usage End Time:**	08:52
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	ProPlus
Serial Number:	12l100463	Serial Number:	10d101384
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100q	Model:	-
Serial Number:	13120c029745	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	18.10	**Standard: 240 mV**	
Bar Pres (mmHg):	760.4	Temperature (°C):	18.80
Initial O2 Saturation (%):	101.7	Initial (mV):	240.3
Initial Reading (mg/L):	9.99	Reset to (mV):	240.2
Final O2 Saturation (%):	102.1	Lot No. (240mV):	9ge1169
Meter Reset to (mg/L):	9.97	Exp. Date:	27-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	19.1	20	A8079	27-Mar-2020
100/	101	100	A6229	27-Aug-2019
800/	798	800	A8080	27-Mar-2020
10/Blank	9.8	-	A8061	27-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.309 mS/cmc	1.309 mS/cmc	1.31 mS/cmc	21.1 deg C	8gi651/09-27-2019
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	09:03	19.70	3.97	152.7	4.00	/06-27-2019
10.00	09:03	19.80	10.01	-179.7	10.06	9gd483/04-27-2021
7.00 Check	09:04	19.70	6.99	-18.7	N/A	9gd245/04-27-2021

Analyst Name/Signature & Date Completed: Kylah Wyatt Date: 27-Jun-2019

KW

FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Kylah Wyatt				
Date:	28-Jun-2019	**Usage Start Time:**	07:16	**Usage End Time:**	07:16
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	ProPlus
Serial Number:	12l100463	Serial Number:	10d101384
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100q	Model:	-
Serial Number:	13120c029745	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	18.50	**Standard: 240 mV**	
Bar Pres (mmHg):	770.3	Temperature (°C):	19.00
Initial O2 Saturation (%):	53.0	Initial (mV):	247.4
Initial Reading (mg/L):	4.81	Reset to (mV):	239.9
Final O2 Saturation (%):	53.5	Lot No. (240mV):	9ge1169
Meter Reset to (mg/L):	5.01	Exp. Date:	28-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	19.5	20	A8079	28-Mar-2020
100/	104	100	A6229	28-Aug-2019
800/	806	800	A8080	28-Mar-2020
10/	9.9	-	A8061	28-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.61 mS/cmc	1.61 mS/cmc	1.61 mS/cmc	18.8 deg C	8gi651/09-28-2019
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	07:30	19.40	4.02	105.7	4.00	9gd226/04-28-2021
10.00	07:34	19.30	10.07	-105.9	10.07	9gd483/04-28-2021
7.00 Check	07:37	18.80	7.00	-35.7	N/A	9gb303/02-28-2021

Analyst Name/Signature & Date Completed: Kylah Wyatt Date: 28-Jun-2019

KMW

FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Kylah Wyatt				
Date:	28-Jun-2019	**Usage Start Time:**	15:51	**Usage End Time:**	15:51
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	ProPlus
Serial Number:	12l100463	Serial Number:	10d101384
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	-	Make:	-
Model:	-	Model:	-
Serial Number:	-	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	25.40	**Standard: 240 mV**	
Bar Pres (mmHg):	767.7	Temperature (°C):	27.30
Initial O2 Saturation (%):	107.2	Initial (mV):	231.1
Initial Reading (mg/L):	8.44	Reset to (mV):	229.3
Final O2 Saturation (%):	110.7	Lot No. (240mV):	9ge1169
Meter Reset to (mg/L):	8.77	Exp. Date:	28-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	21	20	A8079	28-Mar-2020
100/	101	100	A6229	28-Jun-2019
800/	789	800	A8080	28-Mar-2020
10/	9.5	-	A8061	28-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.7 mS/cmc	1.7 mS/cmc	1.7 mS/cmc	24.9 deg C	8gi651/09-28-2019
	5 Point Calibration Check (Instrument Readings within +/- 10%)			No	

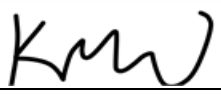
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	15:54	27.30	3.98	114.7	4.01	9gd226/04-28-2021
10.00	16:02	26.00	9.97	-184.3	9.99	9gd483/06-28-2019
7.00 Check	16:05	23.60	7.00	-33.9	N/A	8ga304/06-28-2019

Analyst Name/Signature & Date Completed: Kylah wyatt Date: 28-Jun-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Dan Chamberland				
Date:	29-Jun-2019	**Usage Start Time:**	06:25	**Usage End Time:**	06:25
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	ProPlus
Serial Number:	12L100463	Serial Number:	10D101384
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13120C029745	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	18.10	**Standard: 240 mV**	
Bar Pres (mmHg):	766.3	Temperature (°C):	18.90
Initial O2 Saturation (%):	112.8	Initial (mV):	256.5
Initial Reading (mg/L):	10.42	Reset to (mV):	240.1
Final O2 Saturation (%):	94.4	Lot No. (240mV):	9GE1169
Meter Reset to (mg/L):	8.95	Exp. Date:	01-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	17.7	20	Unk	29-Jun-2019
100/	95.9	100	Unk	29-Jun-2019
800/	794	800	A7062	29-Jun-2019
10/Blank	10.8	-	A8221	29-Aug-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	0.83 mS/cmc	0.83 mS/cmc	0.83 mS/cmc	19.1 deg C	8GI651/09-01-2019
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

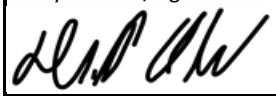
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	06:41	19.00	3.47	126.9	4.00	9GD226/04-01-2021
10.00	06:48	18.60	10.42	-183.7	10.08	9GD483/04-01-2021
7.00 Check	06:35	20.10	7.02	-29.1	N/A	8GA304/01-01-2020

Analyst Name/Signature & Date Completed: Dan Chamberland Date: 29-Jun-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Dan Chamberland				
Date:	29-Jun-2019	**Usage Start Time:**	07:35	**Usage End Time:**	07:55
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	ProPlus
Serial Number:	12l100463	Serial Number:	10d101384
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	-	Make:	-
Model:	-	Model:	-
Serial Number:	-	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	25.40	**Standard: 240 mV**	
Bar Pres (mmHg):	767.7	Temperature (°C):	27.30
Initial O2 Saturation (%):	107.2	Initial (mV):	231.1
Initial Reading (mg/L):	8.44	Reset to (mV):	229.3
Final O2 Saturation (%):	110.7	Lot No. (240mV):	9ge1169
Meter Reset to (mg/L):	8.77	Exp. Date:	28-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	21	20	A8079	28-Mar-2020
100/	101	100	A6229	28-Jun-2019
800/	789	800	A8080	28-Mar-2020
10/	9.5	-	A8061	28-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.7 mS/cmc	1.7 mS/cmc	1.7 mS/cmc	24.9 deg C	8gi651/09-28-2019
	5 Point Calibration Check (Instrument Readings within +/- 10%)			No	

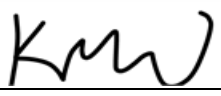
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	15:54	27.30	3.98	114.7	4.01	9gd226/04-28-2021
10.00	16:02	26.00	9.97	-184.3	9.99	9gd483/06-28-2019
7.00 Check	16:05	23.60	7.00	-33.9	N/A	8ga304/06-28-2019

Analyst Name/Signature & Date Completed: Kylah wyatt Date: 29-Jun-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Kylah Wyatt				
Date:	29-Jun-2019	**Usage Start Time:**	18:51	**Usage End Time:**	15:51
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	ProPlus
Serial Number:	17m100413	Serial Number:	14k100940
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100q	Model:	-
Serial Number:	13120c029745	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	29.40	**Standard: 240 mV**	
Bar Pres (mmHg):	748.6	Temperature (°C):	31.60
Initial O2 Saturation (%):	88.0	Initial (mV):	214.9
Initial Reading (mg/L):	6.84	Reset to (mV):	223.6
Final O2 Saturation (%):	82.1	Lot No. (240mV):	9ge1169
Meter Reset to (mg/L):	6.36	Exp. Date:	28-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	20	20	A8079	28-Mar-2020
100/	95.6	100	A6229	28-Jun-2019
800/	797	800	A8080	28-Mar-2020
10/	9.9	-	A8061	28-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.89 mS/cmc	1.89 mS/cmc	1.89 mS/cmc	26.7 deg C	8gi651/09-28-2019
	5 Point Calibration Check (Instrument Readings within +/- 10%)			No	

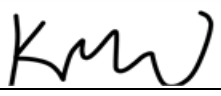
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	18:04	28.10	4.04	153.7	4.01	9gd226/04-28-2021
10.00	18:04	27.00	9.87	-184.3	9.98	9gd483/06-28-2019
7.00 Check	18:05	23.60	7.02	-17.3	N/A	8ga304/06-28-2019

Analyst Name/Signature & Date Completed: Kylah wyatt Date: 28-Jun-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Dan Chamberland				
Date:	30-Jun-2019	**Usage Start Time:**	06:19	**Usage End Time:**	06:19
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	ProPlus
Serial Number:	17M100413	Serial Number:	14K100940
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13120C029745	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	19.10	**Standard: 240 mV**	
Bar Pres (mmHg):	748.4	Temperature (°C):	19.50
Initial O2 Saturation (%):	84.7	Initial (mV):	244.6
Initial Reading (mg/L):	9.10	Reset to (mV):	239.1
Final O2 Saturation (%):	98.3	Lot No. (240mV):	9GE1169
Meter Reset to (mg/L):	9.10	Exp. Date:	01-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	20.8	20	A8079	01-Mar-2020
100/	103	100	A6229	01-Aug-2019
800/	808	800	A8080	01-Mar-2020
10/Blank	9.7	-	A8061	01-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.66 mS/cmc	1.66 mS/cmc	1.65 mS/cmc	20 deg C	8GI651/09-01-2019
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

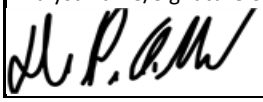
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	06:25	22.00	4.03	151.0	4.00	8GE453/05-01-2020
10.00	06:26	21.60	10.12	-192.5	10.04	8GI262/09-01-2020
7.00 Check	06:33	21.80	6.94	-18.3	N/A	8GA304/01-01-2020

Analyst Name/Signature & Date Completed: Daniel Chamberland Date: 30-Jun-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Dan Chamberland				
Date:	30-Jun-2019	**Usage Start Time:**	16:54	**Usage End Time:**	16:54
				Usage = Time instrument used in field	

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	ProPlus
Serial Number:	17M100413	Serial Number:	14K100940
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13120C09745	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	22.30	**Standard: 240 mV**	
Bar Pres (mmHg):	749.0	Temperature (°C):	22.50
Initial O2 Saturation (%):	122.2	Initial (mV):	237.7
Initial Reading (mg/L):	8.58	Reset to (mV):	235.3
Final O2 Saturation (%):	98.9	Lot No. (240mV):	9GE1169
Meter Reset to (mg/L):	8.60	Exp. Date:	01-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	18.3	20	A8079	01-Mar-2020
100/	96.4	100	A6229	01-Aug-2019
800/	798	800	A8080	01-Mar-2020
10/Blank	10.4	-	A8061	01-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.66 mS/cmc	1.66 mS/cmc	1.65 mS/cmc	22.3 deg C	8GI651/09-01-2019
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

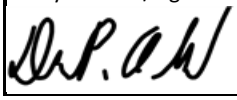
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	16:56	21.90	3.98	152.1	4.00	8GE453/05-01-2020
10.00	16:57	22.00	10.15	-193.4	10.04	8GI262/09-01-2020
7.00 Check	17:04	21.90	7.01	-17.3	N/A	8GA304/01-01-2020

Analyst Name/Signature & Date Completed: Daniel Chamberland Date: 30-Jun-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Dan Chamberland				
Date:	30-Jun-2019	**Usage Start Time:**	15:51	**Usage End Time:**	15:51
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	ProPlus
Serial Number:	18h100703	Serial Number:	10e100237
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100q	Model:	-
Serial Number:	13200c028843	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	22.70	**Standard: 240 mV**	
Bar Pres (mmHg):	748.0	Temperature (°C):	23.10
Initial O2 Saturation (%):	71.1	Initial (mV):	239.1
Initial Reading (mg/L):	5.65	Reset to (mV):	234.5
Final O2 Saturation (%):	60.2	Lot No. (240mV):	9ge1169
Meter Reset to (mg/L):	4.23	Exp. Date:	28-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	20	20	A8079	28-Mar-2020
100/	116	100	A6229	28-Jun-2019
800/	784	800	A8080	28-Mar-2020
10/	10.1	-	A8061	28-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.53 mS/cmc	1.53 mS/cmc	1.53 mS/cmc	22.2 deg C	8gi651/09-28-2019
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

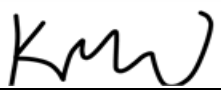
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	16:54	22.10	4.04	98.6	4.00	9gd226/04-28-2021
10.00	16:59	22.10	10.29	-222.5	10.03	9gd483/06-28-2019
7.00 Check	17:03	21.90	7.00	-64.1	N/A	8ga304/06-28-2019

Analyst Name/Signature & Date Completed: Kylah wyatt Date: 30-Jun-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Dan Chamberland				
Date:	01-Jul-2019	**Usage Start Time:**	06:24	**Usage End Time:**	06:24
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	ProPlus
Serial Number:	17M100413	Serial Number:	14K100940
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13120C029745	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	18.30	**Standard: 240 mV**	
Bar Pres (mmHg):	752.1	Temperature (°C):	19.10
Initial O2 Saturation (%):	96.4	Initial (mV):	260.9
Initial Reading (mg/L):	8.80	Reset to (mV):	239.8
Final O2 Saturation (%):	95.2	Lot No. (240mV):	9GE1169
Meter Reset to (mg/L):	8.90	Exp. Date:	01-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	19.9	20	A8079	01-Mar-2020
100/	103	100	A6229	01-Sep-2019
800/	801	800	A8080	01-Mar-2020
10/Blank	10.7	-	A8061	01-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.65 mS/cmc	1.65 mS/cmc	1.65 mS/cmc	19.4 deg C	8GI651/09-01-2019
	5 Point Calibration Check (Instrument Readings within +/- 10%)			No	

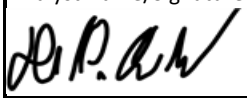
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	06:27	20.80	4.05	148.8	4.00	8GE453/05-01-2020
10.00	06:28	20.70	10.11	-192.8	10.05	8GI262/09-01-2020
7.00 Check	06:31	20.40	6.98	-20.9	N/A	8GA304/01-01-2020

Analyst Name/Signature & Date Completed: Daniel Chamberland Date: 01-Jul-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Dan Chamberland				
Date:	01-Jul-2019	**Usage Start Time:**	08:51	**Usage End Time:**	17:51
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	ProPlus
Serial Number:	17m100413	Serial Number:	14k100940
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100q	Model:	-
Serial Number:	13120c029745	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	31.10	**Standard: 240 mV**	
Bar Pres (mmHg):	749.4	Temperature (°C):	31.90
Initial O2 Saturation (%):	62.0	Initial (mV):	195.1
Initial Reading (mg/L):	4.64	Reset to (mV):	223.4
Final O2 Saturation (%):	77.5	Lot No. (240mV):	9ge1169
Meter Reset to (mg/L):	6.13	Exp. Date:	28-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	21.5	20	A8079	28-Mar-2020
100/	93.6	100	A6229	28-Jun-2019
800/	787	800	A8080	28-Mar-2020
10/Blank	9.5	-	A8061	28-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	0.92 mS/cmc	0.92 mS/cmc	0.97 mS/cmc	26.5 deg C	8gi651/09-28-2019
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

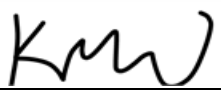
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	17:54	22.10	4.03	148.2	4.00	9gd226/04-28-2021
10.00	17:59	26.20	9.94	-187.5	9.99	9gd483/06-28-2019
7.00 Check	18:03	26.80	7.00	-25.2	N/A	8ga304/06-28-2019

Analyst Name/Signature & Date Completed: Kylah wyatt Date: 01-Jul-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Dan Chamberland				
Date:	02-Jul-2019	**Usage Start Time:**	08:51	**Usage End Time:**	17:51
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	ProPlus
Serial Number:	17m100413	Serial Number:	14k100940
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100q	Model:	-
Serial Number:	13120c029745	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	22.70	**Standard: 240 mV**	
Bar Pres (mmHg):	748.7	Temperature (°C):	22.90
Initial O2 Saturation (%):	57.2	Initial (mV):	237.0
Initial Reading (mg/L):	5.37	Reset to (mV):	234.7
Final O2 Saturation (%):	78.2	Lot No. (240mV):	9ge1169
Meter Reset to (mg/L):	6.70	Exp. Date:	28-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	19.9	20	A8079	28-Mar-2020
100/	102	100	A6229	28-Jun-2019
800/	813	800	A8080	28-Mar-2020
10/Blank	9.7	-	A8061	28-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.83 mS/cmc	1.83 mS/cmc	1.83 mS/cmc	22.2 deg C	8gi651/09-28-2019
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

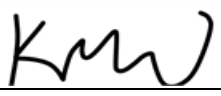
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	07:01	23.30	4.02	148.2	4.00	9gd226/04-28-2021
10.00	08:04	24.00	9.95	-187.2	10.01	9gd483/09-02-2020
7.00 Check	07:03	23.80	7.01	-22.8	N/A	8ga304/06-28-2019

Analyst Name/Signature & Date Completed: Kylah wyatt Date: 02-Jul-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Jessica click				
Date:	02-Jul-2019	**Usage Start Time:**	08:51	**Usage End Time:**	17:51
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	ProPlus
Serial Number:	17m100413	Serial Number:	16j101780
ID Number:	3510-1153	ID Number:	3530-1286

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100q	Model:	-
Serial Number:	13120c029745	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	17.10	**Standard: 240 mV**	
Bar Pres (mmHg):	754.2	Temperature (°C):	16.70
Initial O2 Saturation (%):	111.9	Initial (mV):	223.8
Initial Reading (mg/L):	6.30	Reset to (mV):	242.8
Final O2 Saturation (%):	99.2	Lot No. (240mV):	9ge1169
Meter Reset to (mg/L):	9.54	Exp. Date:	28-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	15.8	20	A8079	28-Mar-2020
100/	92.3	100	A6229	28-Jun-2019
800/	796	800	A8080	28-Mar-2020
10/Blank	9.3	10	A8061	28-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.51 mS/cmc	1.51 mS/cmc	1.51 mS/cmc	17.6 deg C	8gi651/09-28-2019
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	07:13	19.40	3.63	130.8	4.00	9gd226/05-01-2020
10.00	07:16	19.70	9.66	-162.7	10.06	9gd483/09-02-2020
7.00 Check	07:16	19.20	6.98	-46.6	N/A	8ga304/06-28-2019

Analyst Name/Signature & Date Completed: Jessica click Date: 02-Jul-2019

JPG

FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Jessica click				
Date:	2-Jul-19	**Usage Start Time:**	08:51	**Usage End Time:**	17:51
				Usage = Time instrument used in field	

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	ProPlus
Serial Number:	17m100413	Serial Number:	14k100940
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Geotech	Make:	-
Model:	Portable turbidity	Model:	-
Serial Number:	13100c028843	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	23.00	**Standard: 240 mV**	
Bar Pres (mmHg):	751.3	Temperature (°C):	22.60
Initial O2 Saturation (%):	96.1	Initial (mV):	211.9
Initial Reading (mg/L):	8.23	Reset to (mV):	235.1
Final O2 Saturation (%):	98.9	Lot No. (240mV):	9ge1169
Meter Reset to (mg/L):	8.48	Exp. Date:	28-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
10/Blank	10.5	10	A8061	01-Mar-2020
20/	19.5	20	A8079	01-Mar-2020
100/	101	100	A6229	01-Aug-2019
800/	801	800	A8080	01-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.66 mS/cmc	1.66 mS/cmc	1.66 mS/cmc	23.4 deg C	8gi651/09-28-2019
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	06:54	23.80	4.01	152.5	4.00	9gd226/05-01-2020
10.00	07:01	29.40	10.04	-187.9	10.01	9gd483/09-02-2020
7.00 Check	06:56	23.40	7.00	-16.4	N/A	8ga304/01-01-2020

Analyst Name/Signature & Date Completed: Jessica click Date: 02-Jul-2019

JLC

FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Dan Chamberland				
Date:	02-Jul-2019	**Usage Start Time:**	08:51	**Usage End Time:**	17:51
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	ProPlus
Serial Number:	17m100413	Serial Number:	14k100940
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100q	Model:	-
Serial Number:	13120c029745	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	25.70	**Standard: 240 mV**	
Bar Pres (mmHg):	753.0	Temperature (°C):	23.70
Initial O2 Saturation (%):	57.2	Initial (mV):	220.0
Initial Reading (mg/L):	6.30	Reset to (mV):	234.7
Final O2 Saturation (%):	80.2	Lot No. (240mV):	9ge1169
Meter Reset to (mg/L):	7.10	Exp. Date:	28-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	20.1	20	A8079	28-Mar-2020
100/	101	100	A6229	28-Jun-2019
800/	805	800	A8080	28-Mar-2020
10/Blank	10.1	-	A8061	28-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.92 mS/cmc	1.92 mS/cmc	1.92 mS/cmc	23.9 deg C	8gi651/09-28-2019
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

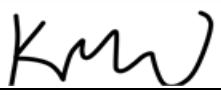
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	16:01	24.70	4.04	152.8	4.00	9gd226/04-28-2021
10.00	16:10	25.20	9.92	-187.2	10.01	9gd483/09-02-2020
7.00 Check	16:05	24.70	7.02	-22.8	N/A	8ga304/06-28-2019

Analyst Name/Signature & Date Completed: Kylah wyatt Date: 02-Jul-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Jessica click				
Date:	2-Jul-19	**Usage Start Time:**	18:41	**Usage End Time:**	19:15
				Usage = Time instrument used in field	

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	ProPlus
Serial Number:	17m100413	Serial Number:	16j101780
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13120c029745	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	21.60	**Standard: 240 mV**	
Bar Pres (mmHg):	745.1	Temperature (°C):	21.50
Initial O2 Saturation (%):	116.6	Initial (mV):	239.8
Initial Reading (mg/L):	8.62	Reset to (mV):	236.6
Final O2 Saturation (%):	97.6	Lot No. (240mV):	9ge1169
Meter Reset to (mg/L):	8.62	Exp. Date:	28-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
10/Blank	9.4	-	A8061	01-Mar-2020
20/	21	20	A8079	01-Mar-2020
100/	97.5	100	A6229	01-Aug-2019
800/	808	800	A8080	01-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.53 mS/cmc	1.53 mS/cmc	1.53 mS/cmc	23.1 deg C	8gi651/09-28-2019
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	06:39	22.20	3.66	136.4	4.00	8GE453/05-01-2020
10.00	06:41	22.20	10.07	-176.8	10.03	8GI262/09-02-2020
7.00 Check	06:44	21.80	7.01	-36.1	N/A	8ga304/01-12-2020

Analyst Name/Signature & Date Completed: Jessica click Date: 02-Jul-2019

JLC

FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Jessica Click				
Date:	2-Jul-19	**Usage Start Time:**	18:41	**Usage End Time:**	19:15
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	ProPlus
Serial Number:	17m100413	Serial Number:	14k100940
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Geotech	Make:	-
Model:	Portable turbidity	Model:	-
Serial Number:	13100c028843	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	28.80	**Standard: 240 mV**	
Bar Pres (mmHg):	747.2	Temperature (°C):	28.10
Initial O2 Saturation (%):	96.6	Initial (mV):	241.7
Initial Reading (mg/L):	7.45	Reset to (mV):	228.0
Final O2 Saturation (%):	96.8	Lot No. (240mV):	9ge1169
Meter Reset to (mg/L):	7.46	Exp. Date:	28-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
10/Blank	9.8	-	A8061	01-Mar-2020
20/	18.7	20	A8079	01-Mar-2020
100/	120	100	A6229	01-Aug-2019
800/	795	800	A8080	01-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.67 mS/cmc	1.67 mS/cmc	1.67 mS/cmc	29.1 deg C	8gi651/09-28-2019
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	18:42	29.60	4.02	155.0	4.01	8GE453/05-01-2020
10.00	17:45	29.80	10.10	-195.0	9.95	8GI262/09-02-2020
7.00 Check	06:56	29.80	6.99	-16.9	N/A	8ga304/01-01-2020

Analyst Name/Signature & Date Completed: Jessica click Date: 02-Jul-2019

JLC

FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Dan Chamberland				
Date:	03-Jul-2019	**Usage Start Time:**	06:47	**Usage End Time:**	06:47
				Usage = Time instrument used in field	

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	ProPlus
Serial Number:	18H100703	Serial Number:	10E100237
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13100C028843	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	22.20	**Standard: 240 mV**	
Bar Pres (mmHg):	749.2	Temperature (°C):	21.80
Initial O2 Saturation (%):	99.4	Initial (mV):	228.6
Initial Reading (mg/L):	8.76	Reset to (mV):	230.4
Final O2 Saturation (%):	100.0	Lot No. (240mV):	8GE1169
Meter Reset to (mg/L):	8.76	Exp. Date:	01-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	18.1	20	A8079	01-Mar-2020
100/	82.5	100	A6229	01-Aug-2019
800/	919	800	A8080	01-Mar-2020
10/Blank	9.8	-	A8061	01-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.37 mS/cmc	1.37 mS/cmc	1.37 mS/cmc	22.4 deg C	8GI651/09-01-2019
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

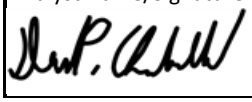
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	06:50	22.60	2.82	160.8	4.00	8GE453/05-01-2020
10.00	06:53	23.60	10.53	-185.6	10.02	8GI262/09-01-2020
7.00 Check	06:54	23.20	7.01	-9.4	N/A	8GA304/01-01-2020

Analyst Name/Signature & Date Completed: Daniel Chamberland Date: 03-Jul-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Dan Chamberland				
Date:	03-Jul-2019	**Usage Start Time:**	13:18	**Usage End Time:**	13:18
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	ProPlus
Serial Number:	18H10070	Serial Number:	10E100237
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13100C028843	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	29.90	**Standard: 240 mV**	
Bar Pres (mmHg):	749.2	Temperature (°C):	29.40
Initial O2 Saturation (%):	85.2	Initial (mV):	227.1
Initial Reading (mg/L):	7.40	Reset to (mV):	226.3
Final O2 Saturation (%):	99.1	Lot No. (240mV):	9GE1169
Meter Reset to (mg/L):	7.37	Exp. Date:	01-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	21.3	20	A8079	01-Mar-2020
100/	126	100	A6229	01-Aug-2019
800/	788	800	A8080	01-Mar-2020
10/Blank	10.9	-	A8061	01-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.33 mS/cmc	1.33 mS/cmc	1.33 mS/cmc	31.5 deg C	8GI651/09-01-2019
	5 Point Calibration Check (Instrument Readings within +/- 10%)			No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	13:23	29.80	3.92	158.6	4.01	8GE453/05-01-2020
10.00	13:24	29.90	10.40	-188.7	9.95	8GI262/09-01-2020
7.00 Check	13:28	30.90	6.99	-11.4	N/A	8GA304/01-01-2020

Analyst Name/Signature & Date Completed: Dan Chamberland Date: 03-Jul-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Kylah Wyatt				
Date:	08-Jul-2019	**Usage Start Time:**	07:05	**Usage End Time:**	07:05
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Quatro
Serial Number:	17m100413	Serial Number:	16j101780
ID Number:	3510-1153	ID Number:	3530-1286

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Geotech	Make:	-
Model:	Geotech turbidimeter	Model:	-
Serial Number:	18091875	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	15.50	**Standard: 240 mV**	
Bar Pres (mmHg):	753.7	Temperature (°C):	15.50
Initial O2 Saturation (%):	118.6	Initial (mV):	234.6
Initial Reading (mg/L):	11.84	Reset to (mV):	244.2
Final O2 Saturation (%):	118.7	Lot No. (240mV):	9ge1169
Meter Reset to (mg/L):	11.85	Exp. Date:	01-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	21.2	20	-	08-Jul-2019
100/	91.6	100	-	08-Jul-2019
800/	821	800	A8080	01-Mar-2020
10/	10.6	-	A8221	08-Aug-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.49 mS/cmc	1.49 mS/cmc	1.48 mS/cmc	16.5 deg C	89i651/07-08-2019
	5 Point Calibration Check (Instrument Readings within +/- 10%)			No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	07:47	16.50	3.93	131.7	4.00	8GE453/05-01-2020
10.00	07:53	17.30	10.31	-187.8	10.09	8GI262/09-01-2020
7.00 Check	07:56	17.20	7.00	-39.4	N/A	8ga304/01-01-2020

Analyst Name/Signature & Date Completed: Jessica Click Date: 08-Jul-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Dan Chamberland				
Date:	08-Jul-2019	**Usage Start Time:**	07:44	**Usage End Time:**	07:44
				Usage = Time instrument used in field	

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	ProPlus
Serial Number:	14H100036	Serial Number:	10D101382
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13120C029746	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	15.80	**Standard: 240 mV**	
Bar Pres (mmHg):	754.1	Temperature (°C):	15.20
Initial O2 Saturation (%):	67.7	Initial (mV):	238.0
Initial Reading (mg/L):	9.82	Reset to (mV):	244.7
Final O2 Saturation (%):	99.1	Lot No. (240mV):	9GE1169
Meter Reset to (mg/L):	9.80	Exp. Date:	01-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
10/	20.9	20	A8079	01-Mar-2020
100/	104	100	A6229	01-Aug-2019
800/	808	800	A8080	01-Mar-2020
10/Blank	9.5	-	A8061	01-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.43 mS/cmc	1.43 mS/cmc	1.43 mS/cmc	16.5 deg C	8GI651/09-01-2019
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

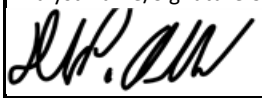
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	07:48	16.30	3.86	157.9	4.00	8GE453/05-01-2020
10.00	07:50	17.20	10.32	-183.6	10.10	8GI262/09-01-2020
7.00 Check	07:55	17.30	7.02	-10.0	N/A	8GA304/01-01-2020

Analyst Name/Signature & Date Completed: Dan Chamberland Date: 08-Jul-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Jessica click				
Date:	08-Jul-2019	**Usage Start Time:**	18:12	**Usage End Time:**	18:12
				Usage = Time instrument used in field	

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	-
Serial Number:	3510-1153	Serial Number:	3530-1286
ID Number:	17m100413	ID Number:	16j101780

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13120C02945	Serial Number:	-
ID Number:	3550-1023	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	29.70	**Standard: 240 mV**	
Bar Pres (mmHg):	751.2	Temperature (°C):	30.80
Initial O2 Saturation (%):	55.3	Initial (mV):	234.7
Initial Reading (mg/L):	4.14	Reset to (mV):	225.0
Final O2 Saturation (%):	55.0	Lot No. (240mV):	9ge1169
Meter Reset to (mg/L):	4.09	Exp. Date:	01-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	18.9	20	A8079	01-Mar-2020
100/	96.4	100	A6229	01-Aug-2019
800/	772	800	-	08-Jul-2019
10/	9	9.3	A8061	01-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.49 mS/cmc	1.49 mS/cmc	1.46 mS/cmc	29.9 deg C	8gl651/09-01-2019
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	18:16	31.20	3.75	134.5	4.01	8ge453/05-01-2020
10.00	18:18	29.50	9.88	-181.9	9.95	8gl262/09-01-2020
7.00 Check	18:22	29.20	6.95	-36.3	N/A	8ga304/01-01-2020

Analyst Name/Signature & Date Completed: Jessica Click Date: 08-Jul-2019

JLC

FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Dan Chamberland				
Date:	08-Jul-2019	**Usage Start Time:**	18:08	**Usage End Time:**	18:08
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	ProPlus
Serial Number:	14H100036	Serial Number:	10D101382
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	1300C028843	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	29.90	**Standard: 240 mV**	
Bar Pres (mmHg):	751.8	Temperature (°C):	31.40
Initial O2 Saturation (%):	98.6	Initial (mV):	217.1
Initial Reading (mg/L):	7.48	Reset to (mV):	224.1
Final O2 Saturation (%):	98.8	Lot No. (240mV):	9GE1169
Meter Reset to (mg/L):	7.46	Exp. Date:	01-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	19.4	20	Unknown	08-Jul-2019
100/	90.6	100	Unknown	08-Jul-2019
800/	824	800	A8080	01-Mar-2020
10/Blank	10.9	-	A8221	01-Aug-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.38 mS/cmc	1.38 mS/cmc	1.38 mS/cmc	29.6 deg C	8GI951/09-01-2019
	5 Point Calibration Check (Instrument Readings within +/- 10%)			No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	18:12	31.70	4.07	158.1	4.00	8GE453/05-01-2020
10.00	18:13	29.40	10.08	-184.9	9.95	8GI262/09-01-2020
7.00 Check	18:16	29.00	6.98	-10.6	N/A	8GA304/01-01-2020

Analyst Name/Signature & Date Completed: Danil Chamberland Date: 08-Jul-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Aaron Sutton				
Date:	09-Jul-2019	**Usage Start Time:**	07:06	**Usage End Time:**	07:06
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	ProPlus
Serial Number:	17M100413	Serial Number:	14K100940
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13100C028843	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	17.60	**Standard: 240 mV**	
Bar Pres (mmHg):	755.2	Temperature (°C):	17.20
Initial O2 Saturation (%):	76.2	Initial (mV):	239.3
Initial Reading (mg/L):	7.29	Reset to (mV):	242.1
Final O2 Saturation (%):	76.5	Lot No. (240mV):	9GE1169
Meter Reset to (mg/L):	7.29	Exp. Date:	01-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	20.6	20	Unknown	09-Jul-2019
100/	101	100	Unknown	09-Jul-2019
800/	795	800	A8080	01-Mar-2020
10/	10.3	-	A8221	01-Aug-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.66 mS/cmc	1.66 mS/cmc	1.66 mS/cmc	18.8 deg C	89I651/09-01-2019
	5 Point Calibration Check (Instrument Readings within +/- 10%)			No	

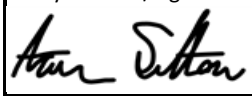
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	07:12	19.90	4.16	130.5	4.00	8GE453/05-01-2020
10.00	07:15	19.70	9.91	-192.5	10.06	8GI262/09-01-2020
7.00 Check	07:18	19.20	6.96	-21.3	N/A	8GA304/01-02-2020

Analyst Name/Signature & Date Completed: Aaron Sutton Date: 09-Jul-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Aaron Sutton				
Date:	09-Jul-2019	**Usage Start Time:**	11:04	**Usage End Time:**	11:04
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	ProPlus
Serial Number:	17M100413	Serial Number:	14K100940
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13100C028843	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	25.20	**Standard: 240 mV**	
Bar Pres (mmHg):	754.5	Temperature (°C):	26.20
Initial O2 Saturation (%):	79.1	Initial (mV):	256.0
Initial Reading (mg/L):	6.48	Reset to (mV):	20.7
Final O2 Saturation (%):	79.0	Lot No. (240mV):	9GE1169
Meter Reset to (mg/L):	6.49	Exp. Date:	01-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	19	20	Unknown	09-Jul-2019
100/	107	100	Unknown	09-Jul-2019
800/	742	800	A8080	01-Mar-2020
10/Blank	9	-	A8221	01-Aug-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.66 mS/cmc	1.66 mS/cmc	1.66 mS/cmc	20.2 deg C	8GI651/09-01-2019
	5 Point Calibration Check (Instrument Readings within +/- 10%)			No	

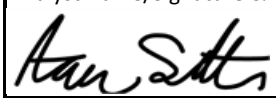
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	11:05	20.00	3.95	147.0	4.00	8GE453/05-01-2020
10.00	11:08	19.80	10.09	-190.3	10.06	8GI262/09-01-2020
7.00 Check	11:11	19.80	6.96	-18.7	N/A	8GA304/01-01-2020

Analyst Name/Signature & Date Completed: Aaron Sutton Date: 11-Jul-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Dan Chamberland				
Date:	09-Jul-2019	**Usage Start Time:**	18:07	**Usage End Time:**	18:07
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	ProPlus
Serial Number:	17M100413	Serial Number:	16J101780
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13120C029745	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	31.80	**Standard: 240 mV**	
Bar Pres (mmHg):	752.4	Temperature (°C):	30.30
Initial O2 Saturation (%):	87.1	Initial (mV):	259.4
Initial Reading (mg/L):	7.69	Reset to (mV):	225.2
Final O2 Saturation (%):	99.4	Lot No. (240mV):	9GE1169
Meter Reset to (mg/L):	7.71	Exp. Date:	01-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	19.3	20	A8079	01-Mar-2020
100/	97.5	100	A6229	01-Aug-2019
800/	786	800	A8080	01-Mar-2020
10/Blank	9.6	-	A8061	01-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.42 mS/cmc	1.42 mS/cmc	1.42 mS/cmc	26.3 deg C	8GI651/09-01-2019
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	18:09	25.80	3.54	137.9	4.01	8GE453/05-01-2020
10.00	18:10	25.00	10.35	-192.4	10.00	8GI262/09-01-2020
7.00 Check	18:14	25.00	6.93	-31.4	N/A	8GA304/01-01-2020

Analyst Name/Signature & Date Completed: Daniel Chamberland Date: 09-Jul-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Dan Chamberland				
Date:	10-Jul-2019	**Usage Start Time:**	06:14	**Usage End Time:**	06:14
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	ProPlus
Serial Number:	17M100413	Serial Number:	14K100940
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13100C028843	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	20.70	**Standard: 240 mV**	
Bar Pres (mmHg):	754.9	Temperature (°C):	18.70
Initial O2 Saturation (%):	97.3	Initial (mV):	238.4
Initial Reading (mg/L):	9.28	Reset to (mV):	240.2
Final O2 Saturation (%):	99.1	Lot No. (240mV):	9GE1169
Meter Reset to (mg/L):	9.15	Exp. Date:	10-Jul-2019

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	20.4	20	A8079	01-Mar-2020
100/	96.6	100	A6229	01-Aug-2019
800/	806	800	A8080	01-Mar-2020
10/Blank	9.3	-	A8061	01-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.65 mS/cmc	1.65 mS/cmc	1.65 mS/cmc	21.7 deg C	8GI651/09-01-2019

5 Point Calibration Check (Instrument Readings within +/- 10%)

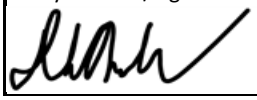
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	06:15	21.50	3.92	151.1	4.00	8GE453/05-01-2020
10.00	06:17	21.90	10.15	-193.0	10.04	8GI262/09-01-2020
7.00 Check	06:18	22.10	6.94	-19.7	N/A	8GA304/01-01-2020

Analyst Name/Signature & Date Completed: Daniel Chamberland Date: 10-Jul-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Kylah Wyatt				
Date:	10-Jul-2019	**Usage Start Time:**	06:39	**Usage End Time:**	06:39
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	ProPlus
Serial Number:	14h100036	Serial Number:	10d101382
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Geotech	Make:	-
Model:	Portable turbidity meter	Model:	-
Serial Number:	18091875	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	18.70	**Standard: 240 mV**	
Bar Pres (mmHg):	754.5	Temperature (°C):	18.70
Initial O2 Saturation (%):	146.0	Initial (mV):	217.2
Initial Reading (mg/L):	13.38	Reset to (mV):	240.3
Final O2 Saturation (%):	139.5	Lot No. (240mV):	9ge1169
Meter Reset to (mg/L):	12.96	Exp. Date:	10-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	20.6	20	210d	10-Sep-2019
100/	101	100	213d	10-Sep-2020
800/	823	800	Unk	10-Jul-2019
/	-	-	-	10-Jul-2019

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.62 mS/cmc	1.62 mS/cmc	1.62 mS/cmc	20.8 deg C	8gei651/09-10-2019
	5 Point Calibration Check (Instrument Readings within +/- 10%)			No	

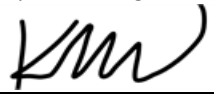
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	06:42	21.20	4.00	150.7	4.00	8ge453/05-10-2020
10.00	06:42	21.40	10.03	-176.8	10.04	8gi262/09-10-2020
7.00 Check	06:44	21.70	7.02		N/A	8ga304/01-10-2020

Analyst Name/Signature & Date Completed: Kylah wyatt Date: 10-Jul-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Dan Chamberland				
Date:	10-Jul-2019	**Usage Start Time:**	06:41	**Usage End Time:**	06:41
				Usage = Time instrument used in field	

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	ProPlus
Serial Number:	17M100413	Serial Number:	16J101780
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13120C029745	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	19.10	**Standard: 240 mV**	
Bar Pres (mmHg):	754.0	Temperature (°C):	18.60
Initial O2 Saturation (%):	110.6	Initial (mV):	231.8
Initial Reading (mg/L):	9.15	Reset to (mV):	240.3
Final O2 Saturation (%):	99.8	Lot No. (240mV):	9GE1169
Meter Reset to (mg/L):	9.27	Exp. Date:	01-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	20	20	A8079	01-Mar-2020
100/	99.6	100	A6229	01-Aug-2019
800/	813	800	A8080	01-Mar-2020
10/Blank	9.9	-	A8061	01-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.43 mS/cmc	1.43 mS/cmc	1.43 mS/cmc	20.6 deg C	8GI651/09-01-2019
	5 Point Calibration Check (Instrument Readings within +/- 10%)			No	

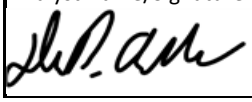
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	06:43	20.50	3.74	135.9	4.00	8GE453/05-01-2020
10.00	06:44	21.40	10.24	-184.1	10.04	8GI262/09-01-2020
7.00 Check	06:46	21.60	6.93	-39.4	N/A	8GA304/01-01-2020

Analyst Name/Signature & Date Completed: Daniel Chamberland Date: 10-Jul-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Dan Chamberland				
Date:	10-Jul-2019	**Usage Start Time:**	16:20	**Usage End Time:**	16:20
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	ProPlus
Serial Number:	17M100413	Serial Number:	14K100940
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13100C028843	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	31.80	**Standard: 240 mV**	
Bar Pres (mmHg):	752.8	Temperature (°C):	34.30
Initial O2 Saturation (%):	102.2	Initial (mV):	230.2
Initial Reading (mg/L):	7.27	Reset to (mV):	219.8
Final O2 Saturation (%):	99.8	Lot No. (240mV):	9GE1169
Meter Reset to (mg/L):	7.33	Exp. Date:	01-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	19.5	20	A8079	01-Mar-2020
100/	97.9	100	A6229	01-Aug-2019
800/	785	800	A8080	01-Mar-2020
10/Blank	9.9	-	A8061	01-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.66 mS/cmc	1.66 mS/cmc	1.66 mS/cmc	28.9 deg C	8GI651/09-01-2019
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

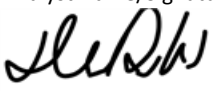
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	16:21	30.00	3.93	157.8	4.00	8GE453/05-01-2020
10.00	16:23	28.10	10.09	-190.9	9.97	8GI262/09-01-2020
7.00 Check	16:26	27.70	6.92	-16.1	N/A	8GA304/01-01-2020

Analyst Name/Signature & Date Completed: DanChamberland Date: 10-Jul-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Kylah Wyatt				
Date:	10-Jul-2019	**Usage Start Time:**	08:51	**Usage End Time:**	17:51
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	ProPlus
Serial Number:	14h10036	Serial Number:	10d101382
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Geotech	Make:	-
Model:	Portable turbidity	Model:	-
Serial Number:	18091875	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	30.40	**Standard: 240 mV**	
Bar Pres (mmHg):	752.2	Temperature (°C):	31.50
Initial O2 Saturation (%):	134.8	Initial (mV):	227.1
Initial Reading (mg/L):	10.28	Reset to (mV):	223.6
Final O2 Saturation (%):	139.9	Lot No. (240mV):	9ge1169
Meter Reset to (mg/L):	10.42	Exp. Date:	28-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
0.0/	-	-	-	10-Jul-2019
20/	-	-	219d	10-Sep-2019
100/	-	-	231d	10-Sep-2020
800/	-	-	Unk	10-Jul-2019

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.61 mS/cmc	1.61 mS/cmc	1.61 mS/cmc	30.9 deg C	8gi651/09-28-2019
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	17:13	30.40	3.93	162.2	4.01	9gd226/05-01-2020
10.00	18:16	29.40	9.98	-178.9	9.95	9gd483/09-02-2020
7.00 Check	17:17	29.20	7.02	-10.1	N/A	8ga304/06-28-2019

Analyst Name/Signature & Date Completed: Kylah wyatt Date: 10-Jul-19

KW

FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Aaron Sutton				
Date:	10-Jul-2019	**Usage Start Time:**	17:22	**Usage End Time:**	17:22
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Quatro
Serial Number:	17M100413	Serial Number:	16J101780
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13120C029745	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	31.90	**Standard: 240 mV**	
Bar Pres (mmHg):	751.5	Temperature (°C):	31.50
Initial O2 Saturation (%):	90.7	Initial (mV):	214.0
Initial Reading (mg/L):	6.65	Reset to (mV):	223.6
Final O2 Saturation (%):	91.1	Lot No. (240mV):	9GE1169
Meter Reset to (mg/L):	6.66	Exp. Date:	01-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	19.6	20	A8079	01-Mar-2020
100/	99.1	100	A6229	01-Aug-2019
800/	782	800	A8080	01-Mar-2020
10/Blank	9.4	-	A8061	01-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.43 mS/cmc	1.43 mS/cmc	1.43 mS/cmc	31.4 deg C	8GI651/09-01-2019
	5 Point Calibration Check (Instrument Readings within +/- 10%)			No	

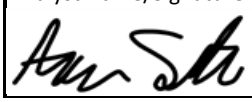
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	17:24	30.10	3.68	-	4.01	8GE453/05-01-2020
10.00	17:25	29.40	10.19	-	9.95	8GI262/09-01-2020
7.00 Check	17:34	29.60	6.98	-30.0	N/A	8GA304/01-01-2020

Analyst Name/Signature & Date Completed: Aaron Sutton Date: 10-Jul-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Dan Chamberland				
Date:	11-Jul-2019	**Usage Start Time:**	06:27	**Usage End Time:**	06:27
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	ProPlus
Serial Number:	17M100413	Serial Number:	16J101780
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13120C029745	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	21.90	**Standard: 240 mV**	
Bar Pres (mmHg):	750.3	Temperature (°C):	21.60
Initial O2 Saturation (%):	100.1	Initial (mV):	240.0
Initial Reading (mg/L):	8.65	Reset to (mV):	236.4
Final O2 Saturation (%):	98.7	Lot No. (240mV):	9GE1169
Meter Reset to (mg/L):	8.64	Exp. Date:	01-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	20.1	20	A8079	01-Mar-2020
100/	101	100	A6229	01-Aug-2019
800/	816	800	A8080	01-Mar-2020
10/Blank	9.7	-	A8060	01-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.39 mS/cmc	1.39 mS/cmc	1.39 mS/cmc	22.3 deg C	8GI651/09-01-2019
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

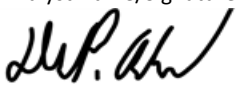
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	06:30	23.60	3.71	138.8	4.00	8GE453/05-01-2020
10.00	06:31	24.10	10.49	-196.7	10.01	8GI262/09-01-2020
7.00 Check	06:36	23.50	6.98	-33.8	N/A	8GA304/01-01-2020

Analyst Name/Signature & Date Completed: Daniel Chamberland Date: 11-Jul-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Dan Chamberland				
Date:	11-Jul-2019	**Usage Start Time:**	11:57	**Usage End Time:**	11:57
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	ProPlus
Serial Number:	14H100036	Serial Number:	10D101382
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Geotech	Make:	-
Model:	Turbidimeter	Model:	-
Serial Number:	18091875	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	27.20	**Standard: 240 mV**	
Bar Pres (mmHg):	749.3	Temperature (°C):	27.10
Initial O2 Saturation (%):	121.4	Initial (mV):	285.1
Initial Reading (mg/L):	7.70	Reset to (mV):	229.3
Final O2 Saturation (%):	96.4	Lot No. (240mV):	9GE1169
Meter Reset to (mg/L):	7.62	Exp. Date:	01-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
0.0/	0	0	Unknown	01-Sep-2019
20/	20.1	20	219D	01-Sep-2019
100/	100	100	231D	01-Sep-2019
800/	806	800	Unknown	11-Jul-2019

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.45 mS/cmc	1.45 mS/cmc	1.45 mS/cmc	26.2 deg C	8GI651/09-01-2019
	5 Point Calibration Check (Instrument Readings within +/- 10%)			No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	11:59	26.60	4.05	157.8	4.01	8GE453/05-01-2020
10.00	12:00	25.70	10.10	-186.1	9.99	8GI262/09-01-2020
7.00 Check	12:02	26.10	6.98	-11.3	N/A	8GA304/01-01-2020

Analyst Name/Signature & Date Completed: Daniel Chamberland Date: 11-Jul-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Jessica click				
Date:	11-Jul-2019	**Usage Start Time:**	16:22	**Usage End Time:**	16:22
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Quatro
Serial Number:	17m100413	Serial Number:	16j101780
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13120C09745	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	27.60	**Standard: 240 mV**	
Bar Pres (mmHg):	745.7	Temperature (°C):	28.00
Initial O2 Saturation (%):	87.1	Initial (mV):	204.1
Initial Reading (mg/L):	7.66	Reset to (mV):	228.1
Final O2 Saturation (%):	88.1	Lot No. (240mV):	9ge1169
Meter Reset to (mg/L):	7.60	Exp. Date:	11-Jul-2019

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	19.5	20	A8079	01-Mar-2020
100/	99.6	100	A6229	01-Aug-2019
800/	788	800	A8080	11-Mar-2020
10/	10.1	10	A8061	01-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.65 mS/cmc	1.65 mS/cmc	1.65 mS/cmc	29.4 deg C	8gl651/09-11-2019
	5 Point Calibration Check (Instrument Readings within +/- 10%)			No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	18:35	29.00	4.20	115.2	4.01	8ge453/07-11-2019
10.00	18:36	29.60	9.85	-180.7	9.95	8gl262/09-11-2020
7.00 Check	18:41	29.80	7.04	-38.3	N/A	8ga304/01-11-2020

Analyst Name/Signature & Date Completed: Jessica click Date: 11-Jul-2019

JLC

FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Dan Chamberland				
Date:	11-Jul-2019	**Usage Start Time:**	18:41	**Usage End Time:**	18:41
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	ProPlus
Serial Number:	14H100036	Serial Number:	10D101382
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Geotech	Make:	-
Model:	Turbidimeter	Model:	-
Serial Number:	18091875	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	27.70	**Standard: 240 mV**	
Bar Pres (mmHg):	746.4	Temperature (°C):	27.90
Initial O2 Saturation (%):	113.3	Initial (mV):	222.2
Initial Reading (mg/L):	7.72	Reset to (mV):	228.2
Final O2 Saturation (%):	98.1	Lot No. (240mV):	9GE1169
Meter Reset to (mg/L):	7.72	Exp. Date:	01-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
0.0/	0	0.2	Unknown	11-Jul-2019
20/	19.8	20	219D	01-Sep-2019
100/	99.9	100	231D	01-Sep-2020
800/	802	800	Unknown	11-Jul-2019

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.43 mS/cmc	1.43 mS/cmc	1.43 mS/cmc	29.4 deg C	8GI651/09-01-2019
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

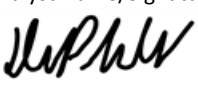
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	18:44	29.80	3.98	161.7	4.01	8GE453/05-01-2020
10.00	18:45	29.80	10.11	-186.0	9.95	8GI262/09-01-2020
7.00 Check	18:48	29.70	6.98	-9.9	N/A	8GA304/01-01-2020

Analyst Name/Signature & Date Completed: Daniel Chamberland Date: 11-Jul-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Jessica Click				
Date:	12-Jul-2019	**Usage Start Time:**	06:58	**Usage End Time:**	06:58
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	ProPlus
Serial Number:	17M100413	Serial Number:	14K100940
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13100C028843	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	21.80	**Standard: 240 mV**	
Bar Pres (mmHg):	746.3	Temperature (°C):	21.80
Initial O2 Saturation (%):	104.5	Initial (mV):	228.1
Initial Reading (mg/L):	9.18	Reset to (mV):	236.2
Final O2 Saturation (%):	98.2	Lot No. (240mV):	9ge1169
Meter Reset to (mg/L):	8.62	Exp. Date:	12-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	22.2	20	A8079	12-Mar-2020
100/	90.3	100	A6229	12-Aug-2019
800/	804	800	A8080	12-Mar-2020
10/	9.5	-	A8061	12-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.68 mS/cmc	1.68 mS/cmc	1.68 mS/cmc	22.9 deg C	8gi651/09-12-2019
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	06:59	22.10	4.00	150.8	4.00	8GE453/05-01-2020
10.00	07:00	22.10	10.11	-191.9	10.03	8GI262/09-01-2020
7.00 Check	07:02	21.80	6.98	-20.4	N/A	8ga304/01-12-2020

Analyst Name/Signature & Date Completed: Jessica click Date: 12-Jul-2019

JLC

FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Jessica Click				
Date:	12-Jul-2019	**Usage Start Time:**	06:36	**Usage End Time:**	12:15
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	ProPlus
Serial Number:	14h100036	Serial Number:	10d101382
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Geotech	Make:	-
Model:	Portable turbidity	Model:	-
Serial Number:	18091875	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	21.60	**Standard: 240 mV**	
Bar Pres (mmHg):	745.8	Temperature (°C):	21.20
Initial O2 Saturation (%):	103.6	Initial (mV):	220.5
Initial Reading (mg/L):	8.92	Reset to (mV):	237.1
Final O2 Saturation (%):	96.3	Lot No. (240mV):	9ge1169
Meter Reset to (mg/L):	8.46	Exp. Date:	28-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
0.0/	-	-	-	12-Jul-2019
20/	-	-	219d	12-Sep-2019
100/	-	-	231d	12-Sep-2020
800/	-	-	-	12-Jul-2019

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.45 mS/cmc	1.45 mS/cmc	1.45 mS/cmc	23 deg C	8gi651/09-28-2019
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	06:40	22.20	4.22	149.0	4.00	8GE453/05-01-2020
10.00	06:45	22.20	10.05	-180.0	10.03	8GI262/09-02-2020
7.00 Check	06:52	21.90	7.01	-14.0	N/A	8ga304/01-12-2020

Analyst Name/Signature & Date Completed: Jessica Click Date: 12-Jul-2019

JLC

FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Jessica click				
Date:	12-Jul-2019	**Usage Start Time:**	06:36	**Usage End Time:**	12:15
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Quatro
Serial Number:	17m100413	Serial Number:	14K100940
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13100C028843	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	20.50	**Standard: 240 mV**	
Bar Pres (mmHg):	751.0	Temperature (°C):	20.60
Initial O2 Saturation (%):	110.4	Initial (mV):	245.3
Initial Reading (mg/L):	8.90	Reset to (mV):	237.7
Final O2 Saturation (%):	98.9	Lot No. (240mV):	9ge1169
Meter Reset to (mg/L):	8.90	Exp. Date:	28-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
10/	9.9	-	A8061	12-Mar-2020
20/	20.1	20	A8079	01-Mar-2020
100/	101	100	A6229	12-Aug-2019
800/	749	800	A8080	12-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.59 mS/cmc	1.59 mS/cmc	1.59 mS/cmc	20.7 deg C	8gi651/09-28-2019
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	07:03	19.70	4.09	143.1	4.00	8GE453/05-01-2020
10.00	07:06	19.60	9.88	-183.8	10.06	8GI262/09-02-2020
7.00 Check	07:09	19.80	7.07	-17.4	N/A	8ga304/01-12-2020

Analyst Name/Signature & Date Completed: Jessica click Date: 12-Jul-2019

JLC

FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Jessica click				
Date:	12-Jul-2019	**Usage Start Time:**	14:05	**Usage End Time:**	19:15
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	ProPlus
Serial Number:	17m100413	Serial Number:	16j101780
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13120c029745	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	26.40	**Standard: 240 mV**	
Bar Pres (mmHg):	745.5	Temperature (°C):	28.20
Initial O2 Saturation (%):	86.3	Initial (mV):	259.6
Initial Reading (mg/L):	6.95	Reset to (mV):	227.8
Final O2 Saturation (%):	98.1	Lot No. (240mV):	9ge1169
Meter Reset to (mg/L):	7.90	Exp. Date:	28-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
10/Blank	9.7	-	A8061	01-Mar-2020
20/	19.6	20	A8079	01-Mar-2020
100/	97.4	100	A6229	01-Aug-2019
800/	782	800	A8080	01-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.5 mS/cmc	1.5 mS/cmc	1.5 mS/cmc	25.2 deg C	8gi651/09-28-2019
	5 Point Calibration Check (Instrument Readings within +/- 10%)			No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	14:07	27.20	3.66	138.0	4.01	8GE453/05-01-2020
10.00	14:10	25.80	10.22	-185.9	9.99	8GI262/09-02-2020
7.00 Check	14:13	25.90	7.08	-37.7	N/A	8ga304/01-12-2020

Analyst Name/Signature & Date Completed: Jessica click Date: 12-Jul-19

JLC

FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Jessica click				
Date:	12-Jul-2019	**Usage Start Time:**	14:36	**Usage End Time:**	19:15
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	ProPlus
Serial Number:	17m100413	Serial Number:	14k100940
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13100c028843	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	24.60	**Standard: 240 mV**	
Bar Pres (mmHg):	747.3	Temperature (°C):	26.70
Initial O2 Saturation (%):	85.0	Initial (mV):	226.1
Initial Reading (mg/L):	7.08	Reset to (mV):	229.9
Final O2 Saturation (%):	98.3	Lot No. (240mV):	9ge1169
Meter Reset to (mg/L):	8.19	Exp. Date:	28-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
10/Blank	9.8	-	A8061	01-Mar-2020
20/	19.2	20	A8079	01-Mar-2020
100/	102	100	A6229	01-Aug-2019
800/	773	800	A8080	01-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.69 mS/cmc	1.69 mS/cmc	1.69 mS/cmc	25.3 deg C	8gi651/09-28-2019
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	14:40	25.80	4.01	151.2	4.01	8GE453/05-01-2020
10.00	14:43	25.70	10.00	-188.9	9.99	8GI262/09-02-2020
7.00 Check	14:48	25.70	7.01	-19.2	N/A	8ga304/01-12-2020

Analyst Name/Signature & Date Completed: Jessica click Date: 12-Jul-2019

JLC

FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Jessica Click				
Date:	12-Jul-2019	**Usage Start Time:**	14:36	**Usage End Time:**	19:15
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	ProPlus
Serial Number:	14h100036	Serial Number:	10d101382
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Geotech	Make:	-
Model:	Portable turbidity	Model:	-
Serial Number:	18091875	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	21.60	**Standard: 240 mV**	
Bar Pres (mmHg):	746.7	Temperature (°C):	22.20
Initial O2 Saturation (%):	105.1	Initial (mV):	236.5
Initial Reading (mg/L):	8.98	Reset to (mV):	235.5
Final O2 Saturation (%):	102.7	Lot No. (240mV):	9ge1169
Meter Reset to (mg/L):	8.91	Exp. Date:	28-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
0.0/	-	-	-	12-Jul-2019
20/	-	-	219d	12-Sep-2019
100/	-	-	231d	12-Sep-2020
800/	-	-	-	12-Jul-2019

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.61 mS/cmc	1.61 mS/cmc	1.61 mS/cmc	254.1 deg C	8gi651/09-28-2019
	5 Point Calibration Check (Instrument Readings within +/- 10%)			No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	16:40	23.70	3.91	160.5	4.00	8GE453/05-01-2020
10.00	16:29	23.70	9.88	-174.7	10.02	8GI262/09-02-2020
7.00 Check	16:48	23.60	7.01	-16.2	N/A	8ga304/01-12-2020

Analyst Name/Signature & Date Completed: Jessica click Date: 12-Jul-2019

JLC

FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Jessica click				
Date:	12-Jul-19	**Usage Start Time:**	15:04	**Usage End Time:**	12:15
				Usage = Time instrument used in field	

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Quatro
Serial Number:	17m100413	Serial Number:	14k100940
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13100C028843	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	26.00	**Standard: 240 mV**	
Bar Pres (mmHg):	749.5	Temperature (°C):	26.20
Initial O2 Saturation (%):	80.7	Initial (mV):	249.1
Initial Reading (mg/L):	6.55	Reset to (mV):	230.6
Final O2 Saturation (%):	98.8	Lot No. (240mV):	9ge1169
Meter Reset to (mg/L):	8.01	Exp. Date:	28-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
10/Blank	9.4	-	A8061	12-Mar-2020
20/	21	20	A8079	01-Mar-2020
100/	97.5	100	A6229	12-Aug-2019
800/	771	800	A8080	12-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.5 mS/cmc	1.5 mS/cmc	1.5 mS/cmc	24.7 deg C	8gi651/09-28-2019
	5 Point Calibration Check (Instrument Readings within +/- 10%)			No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	15:06	25.90	4.07	152.7	4.01	8GE453/05-01-2020
10.00	15:09	25.70	10.01	-187.0	9.99	8GI262/09-02-2020
7.00 Check	15:13	25.40	7.03	-20.3	N/A	9ge435/05-12-2021

Analyst Name/Signature & Date Completed: Jessica click Date: 12-Jul-2019

JLC

FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Aaron Sutton				
Date:	13-Jul-2019	**Usage Start Time:**	07:04	**Usage End Time:**	07:04
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	ProPlus
Serial Number:	17M100413	Serial Number:	16J101780
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13120C029745	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	20.60	**Standard: 240 mV**	
Bar Pres (mmHg):	749.9	Temperature (°C):	20.40
Initial O2 Saturation (%):	99.5	Initial (mV):	233.5
Initial Reading (mg/L):	8.95	Reset to (mV):	238.1
Final O2 Saturation (%):	99.7	Lot No. (240mV):	9GE1169
Meter Reset to (mg/L):	8.95	Exp. Date:	01-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	19.9	20	A8079	01-Mar-2020
100/	109	100	A6229	01-Aug-2019
800/	819	800	A8080	01-Mar-2020
10/Blank	9.2	-	A8061	01-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.44 mS/cmc	1.44 mS/cmc	1.44 mS/cmc	20.8 deg C	8GI651/09-01-2019
	5 Point Calibration Check (Instrument Readings within +/- 10%)			No	

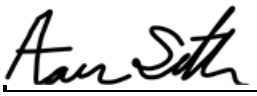
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	07:06	19.80	3.82	129.9	4.00	8GE453/05-01-2020
10.00	07:10	19.80	9.97	-176.2	10.06	8GI262/09-01-2020
7.00 Check	07:14	20.70	7.00	-39.4	N/A	9GE435/05-01-2021

Analyst Name/Signature & Date Completed: Aaron Sutton Date: 13-Jul-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Aaron Sutton				
Date:	13-Jul-2019	**Usage Start Time:**	12:34	**Usage End Time:**	12:34
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	ProPlus
Serial Number:	17M100413	Serial Number:	16J101780
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13120C029745	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	26.00	**Standard: 240 mV**	
Bar Pres (mmHg):	748.9	Temperature (°C):	28.50
Initial O2 Saturation (%):	89.2	Initial (mV):	211.9
Initial Reading (mg/L):	7.22	Reset to (mV):	227.6
Final O2 Saturation (%):	88.7	Lot No. (240mV):	9GE1169
Meter Reset to (mg/L):	7.21	Exp. Date:	01-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	18.9	20	A8079	01-Mar-2020
100/	117	100	A6229	01-Aug-2019
800/	788	800	A8080	01-Mar-2020
10/	10.2	-	A8061	01-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.44 mS/cmc	1.44 mS/cmc	1.44 mS/cmc	23.8 deg C	8GI651/09-01-2019
	5 Point Calibration Check (Instrument Readings within +/- 10%)			No	

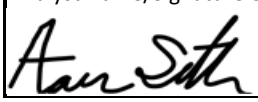
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	12:36	25.10	3.61	136.3	4.01	8GE453/03-01-2020
10.00	12:40	25.50	10.09	-187.4	10.00	8GI262/09-01-2020
7.00 Check	12:45	25.20	7.04	-37.0	N/A	8GA304/01-01-2020

Analyst Name/Signature & Date Completed: Aaron Sutton Date: 13-Jul-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Aaron Sutton				
Date:	14-Jul-2019	**Usage Start Time:**	09:19	**Usage End Time:**	09:19
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	ProPlus
Serial Number:	17M100413	Serial Number:	14K100940
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13100C028843	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	24.90	**Standard: 240 mV**	
Bar Pres (mmHg):	751.1	Temperature (°C):	24.00
Initial O2 Saturation (%):	116.3	Initial (mV):	227.1
Initial Reading (mg/L):	9.59	Reset to (mV):	233.3
Final O2 Saturation (%):	116.5	Lot No. (240mV):	9GE1169
Meter Reset to (mg/L):	9.60	Exp. Date:	01-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	19.5	20	A8079	01-Mar-2020
100/	105	100	A6229	01-Aug-2019
800/	818	800	A8080	01-Mar-2020
10/Blank	10	-	A8061	01-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.46 mS/cmc	1.46 mS/cmc	1.46 mS/cmc	23.6 deg C	8GI651/09-01-2019
	5 Point Calibration Check (Instrument Readings within +/- 10%)			No	

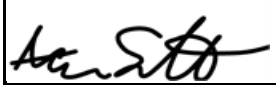
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	09:22	22.80	3.96	152.8	4.00	8GE453/05-01-2020
10.00	09:26	23.50	10.19	-195.3	10.02	9GD483/04-01-2021
7.00 Check	09:30	23.10	6.93	-22.0	N/A	9GE435/05-01-2021

Analyst Name/Signature & Date Completed: Aaron Sutton Date: 14-Jul-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:					
Personnel:	Aaron Sutton, Jessica Click				
Date:	14-Jul-2019	**Usage Start Time:**	16:10	**Usage End Time:**	16:10
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	ProPlus
Serial Number:	17M100413	Serial Number:	14K100940
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13100C028843	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	25.20	**Standard: 240 mV**	
Bar Pres (mmHg):	752.1	Temperature (°C):	27.20
Initial O2 Saturation (%):	98.4	Initial (mV):	231.4
Initial Reading (mg/L):	8.18	Reset to (mV):	229.5
Final O2 Saturation (%):	99.5	Lot No. (240mV):	9ge1169
Meter Reset to (mg/L):	8.24	Exp. Date:	14-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	20.5	20	A8079	01-Mar-2020
100/	98.4	100	A6229	01-Aug-2019
800/	768	800	A8080	01-Mar-2020
10/Blank	9.4	-	A8061	01-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.66 mS/cmc	1.66 mS/cmc	1.66 mS/cmc	22.6 deg C	8gi651/09-14-2019
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

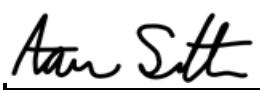
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	16:11	22.80	3.96	145.4	4.00	8ge453/05-14-2020
10.00	16:14	22.50	9.96	-190.6	10.00	9gd483/04-14-2021
7.00 Check	16:16	22.10	7.04	-24.9	N/A	9ge435/05-14-2021

Analyst Name/Signature & Date Completed: Date: 14-Jul-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:					
Personnel:	Jessica click				
Date:	15-Jul-2019	**Usage Start Time:**	07:58	**Usage End Time:**	07:58
				Usage = Time instrument used in field	

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Quatro
Serial Number:	17m100413	Serial Number:	14k100940
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13100C028843	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	19.90	**Standard: 240 mV**	
Bar Pres (mmHg):	755.2	Temperature (°C):	19.90
Initial O2 Saturation (%):	107.7	Initial (mV):	235.1
Initial Reading (mg/L):	9.77	Reset to (mV):	238.6
Final O2 Saturation (%):	99.4	Lot No. (240mV):	9ge1169
Meter Reset to (mg/L):	9.08	Exp. Date:	15-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	20.3	20	A8079	15-Mar-2020
100/	100	100	A6229	15-Aug-2019
800/	838	800	A8080	15-Mar-2020
10/	9.5	10	A8061	15-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.58 mS/cmc	1.58 mS/cmc	1.58 mS/cmc	20 deg C	8gi651/09-15-2019
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	08:02	19.90	3.93	150.0	4.00	9ge435/05-15-2021
10.00	08:04	19.60	10.07	-188.3	10.06	9gd483/04-15-2021
7.00 Check	08:06	19.50	7.10	-23.8	N/A	9ge435/05-15-2021

Analyst Name/Signature & Date Completed: Jessica click Date: 15-Jul-2019

JLC

FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Aaron Sutton				
Date:	15-Jul-2019	**Usage Start Time:**	14:42	**Usage End Time:**	14:42
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	ProPlus
Serial Number:	17M100413	Serial Number:	14K100940
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13100C028843	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	23.90	**Standard: 240 mV**	
Bar Pres (mmHg):	754.6	Temperature (°C):	24.50
Initial O2 Saturation (%):	108.0	Initial (mV):	231.0
Initial Reading (mg/L):	9.12	Reset to (mV):	232.8
Final O2 Saturation (%):	108.5	Lot No. (240mV):	9GE1169
Meter Reset to (mg/L):	9.13	Exp. Date:	01-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	19.7	20	A8079	01-Mar-2020
100/	101	100	A6229	01-Aug-2019
800/	794	800	A8080	01-Mar-2020
10/Blank	9.7	-	A8061	01-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.61 mS/cmc	1.61 mS/cmc	1.6 mS/cmc	23.7 deg C	8GI651/09-01-2019
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

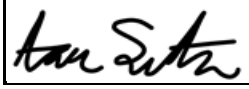
pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	14:43	24.10	4.02	150.3	4.00	9GD684/04-01-2021
10.00	14:47	23.60	10.11	-194.7	10.02	9GD483/04-01-2021
7.00 Check	14:51	24.20	6.94	-22.0	N/A	9GE435/05-01-2021

Analyst Name/Signature & Date Completed: Aaron Sutton Date: 15-Jul-2019



FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Jessica click				
Date:	16-Jul-2019	**Usage Start Time:**	06:56	**Usage End Time:**	06:56
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Quatro
Serial Number:	17m100413	Serial Number:	14k100940
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13100C028843	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	20.50	**Standard: 240 mV**	
Bar Pres (mmHg):	754.7	Temperature (°C):	20.20
Initial O2 Saturation (%):	99.9	Initial (mV):	258.5
Initial Reading (mg/L):	9.96	Reset to (mV):	238.2
Final O2 Saturation (%):	99.3	Lot No. (240mV):	9ge1169
Meter Reset to (mg/L):	9.99	Exp. Date:	16-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	19.9	20	A8079	01-Mar-2020
100/	100	100	A6229	01-Aug-2019
800/	821	800	A8080	01-Mar-2020
10/Blank	9.9	-	A8061	01-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.48 mS/cmc	1.48 mS/cmc	1.48 mS/cmc	21.1 deg C	8gi65i/09-16-2019
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	07:00	20.90	3.98	143.3	4.00	9gd684/04-16-2021
10.00	07:01	21.20	10.07	-195.9	10.05	9gd483/04-16-2021
7.00 Check	07:04	20.40	7.09	-29.6	N/A	9ge435/05-16-2021

Analyst Name/Signature & Date Completed: Jessica click Date: 16-Jul-19

JLC

FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Jessica click				
Date:	16-Jul-2019	**Usage Start Time:**	11:20	**Usage End Time:**	11:20
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Quatro
Serial Number:	17m100413	Serial Number:	14k100940
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13100c028843	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	24.40	**Standard: 240 mV**	
Bar Pres (mmHg):	753.6	Temperature (°C):	23.60
Initial O2 Saturation (%):	98.5	Initial (mV):	224.5
Initial Reading (mg/L):	8.22	Reset to (mV):	233.7
Final O2 Saturation (%):	98.9	Lot No. (240mV):	9ge1169
Meter Reset to (mg/L):	8.25	Exp. Date:	16-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	19.6	20	A8079	16-Mar-2020
100/	99.1	100	A6229	16-Aug-2019
800/	781	800	A8080	16-Mar-2020
10/	9.5	-	A8061	16-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.53 mS/cmc	1.53 mS/cmc	1.53 mS/cmc	22.5 deg C	8gi651/09-16-2019
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	11:22	23.10	3.88	147.7	4.00	9gd684/04-16-2021
10.00	11:23	22.90	10.11	-195.7	10.02	9gd483/04-16-2021
7.00 Check	11:26	23.40	7.02	-27.1	N/A	9ge435/05-16-2021

Analyst Name/Signature & Date Completed: Jessica click Date: 16-Jul-19

JLC

FIELD CALIBRATION LOG SHEET

Site/Project/Location:	Burlington				
Personnel:	Jessica click				
Date:	17-Jul-2019	**Usage Start Time:**	07:17	**Usage End Time:**	07:17
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Quatro
Serial Number:	17m100413	Serial Number:	14k100940
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13100c28843	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	18.80	**Standard: 240 mV**	
Bar Pres (mmHg):	751.0	Temperature (°C):	18.20
Initial O2 Saturation (%):	96.5	Initial (mV):	215.8
Initial Reading (mg/L):	8.94	Reset to (mV):	140.8
Final O2 Saturation (%):	99.0	Lot No. (240mV):	9ge1169
Meter Reset to (mg/L):	9.18	Exp. Date:	17-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	20.3	20	A8079	17-Mar-2020
100/	100	100	A6229	17-Aug-2019
800/	795	800	A8080	17-Mar-2020
10/	9.7	10	A8061	17-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.47 mS/cmc	1.47 mS/cmc	1.47 mS/cmc	20.2 deg C	8gi651/09-17-2019
5 Point Calibration Check (Instrument Readings within +/- 10%)				No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	07:22	20.20	3.94	144.2	4.00	9gd684/04-17-2021
10.00	07:23	20.10	10.02	-191.1	10.06	9gd483/04-17-2021
7.00 Check	07:26	20.60	7.10	-27.1	N/A	9ge435/05-17-2021

Analyst Name/Signature & Date Completed: Jessica click Date: 17-Jul-2019

JLC

FIELD CALIBRATION LOG SHEET

Site/Project/Location:					
Personnel:	Jessica click				
Date:	17-Jul-2019	**Usage Start Time:**	10:47	**Usage End Time:**	10:47
					Usage = Time instrument used in field

INSTRUMENT ID NUMBERS		**METER ID NUMBERS**	
Make:	YSI	Make:	YSI
Model:	Quatro	Model:	Quatro
Serial Number:	17m1004413	Serial Number:	14k100940
ID Number:	-	ID Number:	-

TURBIDITY METER ID NUMBERS		**DO METER ID NUMBERS**	
Make:	Hach	Make:	-
Model:	2100Q	Model:	-
Serial Number:	13100c028843	Serial Number:	-
ID Number:	-	ID Number:	-

Dissolved Oxygen Calibration		**ORP Calibration**	
Water Temp (°C):	21.30	**Standard: 240 mV**	
Bar Pres (mmHg):	250.9	Temperature (°C):	21.20
Initial O2 Saturation (%):	104.3	Initial (mV):	270.1
Initial Reading (mg/L):	9.22	Reset to (mV):	236.9
Final O2 Saturation (%):	98.5	Lot No. (240mV):	9ge1169
Meter Reset to (mg/L):	8.76	Exp. Date:	17-Feb-2020

Turbidity Calibration

Standard (NTU)	Initial (NTU)	Reset to (NTU)	Lot No. (0.0 NTU)	Exp. Date
20/	20	20	A8079	01-Mar-2020
100/	98.7	100	A6229	01-Aug-2019
800/	793	800	A8080	01-Mar-2020
10/Blank	9.6	-	A8061	01-Mar-2020

Specific Conductance Calibration

	Concentration	Initial Reading	Reset To	Temperature	Lot No. & Exp. Date
Standard # 1	1.47 mS/cmc	1.47 mS/cmc	1.47 mS/cmc	20.9 deg C	8gi651/09-17-2019
	5 Point Calibration Check (Instrument Readings within +/- 10%)			No	

pH Calibration (* Record to two decimal places)

7.00 Buffer Check -- Immediately After Initial Calibration -- MUST BE within +/- 0.1 units of 7.00

7.00 Buffer Check -- Every 3 Hours After Initial Calibration -- MUST BE within +/- 0.2 units of 7.00

Buffer	Time	Temperature (oC)	Initial Reading	Input Reading	Reset To	Lot No. & Exp. Date
4.00	10:50	21.30	4.01	145.8	4.00	9gd684/04-17-2021
10.00	10:50	21.30	9.99	-188.6	10.04	9gd483/04-17-2021
7.00 Check	10:53	21.00	7.10	-24.7	N/A	9ge435/05-17-2021

Analyst Name/Signature & Date Completed: Jessica Click Date: 17-Jul-2019

JLC

APPENDIX D Land Survey Report

LAT: N44°29'03.6"
LON: W73°09'54.0"

200
285.21
MW AASF06-MW02S
202
285.49
COLLAR AASF06-MW02S
201
285.28
GROUND AASF06-MW02S

LAT: N44°28'59.0"
LON: W73°09'49.1"

206
267.06
MW AASF06-MW03S
207
267.33
COLLAR AASF06-MW03S
208
267.41
GROUND AASF06-MW03S

LAT: N44°28'54.8"
LON: W73°09'58.9"

203
298.07
MW AASF06-MW01S
204
298.46
COLLAR AASF06-MW01S
205
298.39
GROUND AASF06-MW01S

LAT: N44°28'51.2"
LON: W73°09'42.4"

219
284.17
MW BRLTNDG-MW01S
220
284.43
COLLAR BRLTNDG-MW01S
221
284.37
GROUND BRLTNDG-MW01S

LAT: N44°28'51.2"
LON: W73°09'42.3"

216
284.29
MW BRLTNDG-MW01D
217
284.53
COLLAR BRLTNDG-MW01D
218
284.40
GROUND BRLTNDG-MW01D

LAT: N44°28'53.3"
LON: W73°09'09.0"

258
221.92
MW BRLTNDG-MW04D
259
222.36
COLLAR BRLTNDG-MW04D
260
222.32
GROUND BRLTNDG-MW04D

LAT: N44°28'53.3"
LON: W73°09'09.0"

255
222.08
MW BRLTNDG-MW04S
256
222.46
COLLAR BRLTNDG-MW04S
257
222.46
GROUND BRLTNDG-MW04S

LAT: N44°28'48.5"
LON: W73°09'07.6"

261
296.16
MW BRLTNDG-MW02S
262
296.68
COLLAR BRLTNDG-MW02S
263
296.47
GROUND BRLTNDG-MW02S

LAT: N44°28'47.9"
LON: W73°09'02.3"

249
296.38
MW BRLTNDG-MW03D
250
296.76
COLLAR BRLTNDG-MW03D
254
296.60
GROUND BRLTNDG-MW03S

LAT: N44°28'47.8"
LON: W73°09'02.3"

252
296.38
MW BRLTNDG-MW03S
253
296.70
COLLAR BRLTNDG-MW03S
251
296.56
GROUND BRLTNDG-MW03D

LAT: N44°28'53.9"
LON: W73°08'48.1"

246
247.28
MW BRLTNDG-MW05S
247
247.77
COLLAR BRLTNDG-MW05S
248
247.65
GROUND BRLTNDG-MW05S

LAT: N44°28'53.9"
LON: W73°08'48.1"

243
247.48
MW BRLTNDG-MW05D
244
247.89
COLLAR BRLTNDG-MW05D
245
247.84
GROUND BRLTNDG-MW05D

240
282.44
MW MW-401
241
282.61
COLLAR MW-401
242
282.56
GROUND MW-401

LAT: N44°28'37.6"
LON: W73°08'44.8"

237
282.49
MW MW-405
238
282.69
COLLAR MW-405
239
282.64
GROUND MW-405

LAT: N44°28'34.0"
LON: W73°08'47.2"

228
323.79
MW BRLTN03-MW01D
229
324.02
COLLAR BRLTN03-MW01D
230
323.91
GROUND BRLTN03-MW01D

LAT: N44°28'34.5"
LON: W73°09'02.3"

225
323.67
MW BRLTN03-MW01S
226
323.91
COLLAR BRLTN03-MW01S
227
323.90
GROUND BRLTN03-MW01S

LAT: N44°28'34.5"
LON: W73°09'02.3"

LAT: N44°28'31.4"
LON: W73°08'57.8"

231
325.21
MW BRLTN02-MW01S
232
325.55
COLLAR BRLTN02-MW01S
233
325.33
GROUND BRLTN02-MW01S

LAT: N44°28'31.4"
LON: W73°08'57.9"

234
324.90
MW BRLTN02-MW01D
235
325.19
COLLAR BRLTN02-MW01D
236
325.13
GROUND BRLTN02-MW01D

LAT: N44°28'28.9"
LON: W73°09'03.7"

209
324.09
MW BRLTN04-MW01S
211
324.33
COLLAR BRLTN04-MW01S
212
324.20
GROUND BRLTN04-MW01S

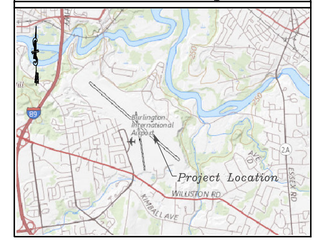
213
323.93
MW BRLTN04-MW01D
214
324.32
COLLAR BRLTN04-MW01D
215
324.25
GROUND BRLTN04-MW01D

LAT: N44°28'28.9"
LON: W73°09'03.6"

222
326.78
MW BRLTNUP-MW01D
223
327.11
COLLAR BRLTNUP-MW01D
224
327.03
GROUND BRLTNUP-MW01D

LAT: N44°28'23.6"
LON: W73°09'06.6"

Location Map



SURVEY	NY
DESIGNED	
DRAWN	DAS
CHECKED	DFH
SCALE	

SUMMIT ENGINEERING, INC
Engineers • Surveyors • Planners • Landscape Architects
1233 Shelburne Road C2
South Burlington, VT 05403
(802) 658-5588

SITE PLAN

(PFAS) MONITOR WELLS
PARSONS GOVERMENT SERVICES INC.
Burlington Air National Gaurd Base
South Burlington, Vermont

©

DATE	7/30/19
DRAWING NO.	S2
PROJECT NO.	8433

APPENDIX E Well Development Logs

WELL DEVELOPMENT LOG

Well ID:	AASF06-MW01S		
Date:	06/24/2019	Field Personnel:	Kylah Wyatt
Site Name:	Burlington	Contractor:	Parsons
AOC:	6	Evacuation Method	submersible pump|surge block
Project No.:	30001		

Weather

Temperature °F	Precipitation	Wind Speed mph	Wind Direciton	Sky
70	None	5	N	Sunny

Depth to Bottom (Initial):	14.8 ft.	Date(s) Installed:	06/14/2019-06/15/2019	Driller:	Cascade
Depth to Bottom (Final):	14.84 ft.			Well Diameter:	2 in.
Depth to Water (Initial)	7.38 ft.	Date(s) Developed:			
Depth to Water (Final):	14.84 ft.	06/24/2019 to 06/27/2019		Development Times	
Measuring Point:	Top of Casing			Start	05:55*
Pump Setting (Intake):	9			Stop:	06:28*
Water Column Volume:	1.21 gal.			Total:	67 min.

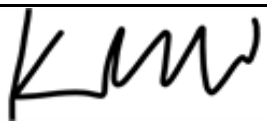
Reading #	Volume Removed Gallons	Temp. °C	pH s.u.	Conductivity mS/cm	Turbidity NTU	Approximate Flow Rate gal/min	DTW ft.	Appearance of Water Color	Odor
Start		-	-	-	-	1	7.45	white	none
1	3.7	-	-	-	-	-	14.2	white	Slightly
2	3.7	-	-	-	-	-	12.13	-	-
3	4	10.6	8.24	0.316	395	0.3	13.14	white	-
4	4.3	10.8	8.92	0.306	549	0.3	13.83	white	none
5	4.8	10.2	9.3	0.305	9999999	0.3	14.55	white	none
6	5	9.9	7.63	0.321	9999999	0.3	14.5	white	none

Total volume of Development water removed: (gallons) 5

Development Water Characteristics:

Physical Appearance at start		Physical Appearance at end	
Color:	white	Color:	white
Odor:	none	Odor:	none
Sheen/Free Product:	-	Sheen/Free Product:	No

WELL DEVELOPMENT LOG

Notes:	Soft bottom. Surged for 10 mins. 190 gal added during drilling. Cannot achieve flow rate to remove water added during drilling. 6/24/19: purged dry (3.7 gal removed) @9:05. DTW @ 13:58 is 12.47 ft btoc - not sufficiently recovered. 6/25/19: DTW at 8:33 is 12.13 ft btoc. DTW observed on 6/24 (7.38 ft btoc) is likely a product of water added during drilling. Purged well dry (first time). 8:45. Attempt low flow pump test. 80 mL/min. Pump on 8:48 DTW 12.53 ft btoc. 8:54 DTW 12.80 ft btoc. 80 mL/min 9:24 DTW 24.2 FT btoc. 100 mL/ min 9:40 well dry (second time). TD 14.83 FT BTOC. 6/26/19 13:00: DTW 14.20 ft btoc. Did not purge due to low volume. 6/27/19 8 am: DTW 14.11 ft btoc. Purged dry (third time). Development complete. *Development took place over multiple days, causing Start/Stop times to calculate incorrectly
Geologist Signature:	

WELL DEVELOPMENT LOG

Well ID:	AASF06-MW02S		
Date:	06/12/2019	Field Personnel:	Dan Chamberland, Kylah Wyatt
Site Name:	Burlington	Contractor:	Cascade
AOC:	6	Evacuation Method	surge block
Project No.:	30001		

Weather

Temperature °F	Precipitation	Wind Speed mph	Wind Direciton	Sky
72	None	5	NE	Sunny

Depth to Bottom (Initial):	14.74 ft.	Date(s) Installed:	Driller:	Cascade	
Depth to Bottom (Final):	14.8 ft.	06/02/2019	Well Diameter:	2	in.
Depth to Water (Initial)	8.15 ft.	Date(s) Developed:			
Depth to Water (Final):	13.4 ft.	06/12/2019 to 06/13/2019	Development Times		
Measuring Point:	Top of Casing		Start:	09:18	
Pump Setting (Intake):	14.6		Stop:	10:00	
Water Column Volume:	1.07 gal.		Total:	42 min.	

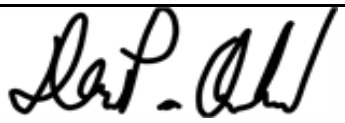
Well Volumes	Volume Removed Gallons	Temp. °C	pH s.u.	Conductivity mS/cm	Turbidity NTU	Approximate Flow Rate gal/min	DTW ft.	Appearance of Water Color	Odor
Start	0	15.2	8.16	0.72	9999	0.2	13.15	grey	none
1	0	17.1	8.15	0.88	9999	0.2	13.4	grey	none

Total volume of Development water removed: (gallons) 4

Development Water Characteristics:

Physical Appearance at start		Physical Appearance at end	
Color:	grey	Color:	grey
Odor:	none	Odor:	none
Sheen/Free Product:	No	Sheen/Free Product:	No

Notes: Purged just over a gallon before well went dry. After surging and pumping the second time it was noted there is a lot of sand in the well. A broken screen is suspected.

Geologist Signature: 

WELL DEVELOPMENT LOG

Well ID:	AASF06-MW03S		
Date:	06/12/2019	Field Personnel:	Dan Chamberland
Site Name:	Burlington	Contractor:	Cascade
AOC:	6	Evacuation Method:	-
Project No.:	30001		

Weather

Temperature °F	Precipitation	Wind Speed mph	Wind Direciton	Sky
70	None	5	E	Sunny

Depth to Bottom (Initial):	15.66 ft.	Date(s) Installed:	Driller:	Cascade	
Depth to Bottom (Final):	15.66 ft.	06/01/2019	Well Diameter:	2	in.
Depth to Water (Initial)	6.76 ft.	Date(s) Developed:			
Depth to Water (Final):	15.5 ft.	06/12/2019 to 06/13/2019	Development Times		
Measuring Point:	Top of Casing		Start	07:29	
Pump Setting (Intake):	15.5		Stop:	09:19	
Water Column Volume:	1.45 gal.		Total:	156.6* min.	

Well Volumes	Volume Removed Gallons	Temp. °C	pH s.u.	Conductivity mS/cm	Turbidity NTU	Approximate Flow Rate gal/min	DTW ft.	Appearance of Water Color	Odor
Start	0	11	7.29	0.61	9999	0.2	7	white	none
1	0	10.8	7.44	0.6	358		7.48	clear	none
2	0	12	7.53	0.84	9999	0.2	7.11	grey	none
3	0	12.2	7.69	0.82	9999	0.22	15.6	grey	none
4	0	-	-	-	-	-	-	-	-

Total volume of Development water removed: (gallons) 12

Development Water Characteristics:

Physical Appearance at start		Physical Appearance at end	
Color:	white	Color:	grey
Odor:	none	Odor:	none
Sheen/Free Product:	-	Sheen/Free Product:	-

Notes:

120 gallons of water added to this well during installation, attempting to purge out three times that volume.
7 gallons purged before the well went dry, will mobilize to a different well and come back later.
5 more gallons were purged by 13:30. The level of recovery I reflected in the water level on the first volume water level.
06/13 well surged for 15 minutes before pumping out water.
*Development spanned multiple days, causing the times and duration to be calculated incorrectly

Geologist Signature:



WELL DEVELOPMENT LOG

Well ID:	BRLTN02-MW01D		
Date:	06/18/2019	Field Personnel:	Kylah Wyatt
Site Name:	Burlington	Contractor:	Parsons
AOC:	2	Evacuation Method	submersible pump|surge block
Project No.:	30001		

Weather

Temperature °F	Precipitation	Wind Speed mph	Wind Direciton	Sky
69	None	5	N	Partly Cloudy

Depth to Bottom (Initial):	60 ft.	Date(s) Installed:	Driller:	Cascade	
Depth to Bottom (Final):	60.1 ft.	06/15/2019	Well Diameter:	2	in.
Depth to Water (Initial)	22.45 ft.	Date(s) Developed:			
Depth to Water (Final):	26.37 ft.	06/18/2019	Development Times		
Measuring Point:	Top of Casing		Start	06:04	
Pump Setting (Intake):	57.5		Stop:	07:19	
Water Column Volume:	6.12 gal.		Total:	74.2	min.

Reading #	Volume Removed Gallons	Temp. °C	pH s.u.	Conductivity mS/cm	Turbidity NTU	Approximate Flow Rate gal/min	DTW ft.	Appearance of Water Color	Odor
Start	0	-	-	-	-	-	28.62	grey	none
1	30	8.3	7.83	0.179	181	1.2	38.43	grey	none
2	37	7.9	7.47	0.149	68.6	1	38.56	grey	none
3	48	7.9	7.84	0.19	43	1	38.5	grey	none
4	60	7.9	8.08	0.2	38.6	1	38.67	clear	none

Total volume of Development water removed: (gallons) 60

Development Water Characteristics:

Physical Appearance at start		Physical Appearance at end	
Color:	grey	Color:	clear
Odor:	none	Odor:	none
Sheen/Free Product:	-	Sheen/Free Product:	No

Notes:
10 gal PFAS-FREE water added during drilling. 3x added volume removed.
10 mins of surging prior to pumping.
Removed >3 well volumes. Development complete.

Geologist Signature:



WELL DEVELOPMENT LOG

Well ID:	BRLTN02-MW01S		
Date:	06/18/2019	Field Personnel:	Kylah Wyatt
Site Name:	Burlington	Contractor:	Parsons
AOC:	2	Evacuation Method	submersible pump|surge block
Project No.:	30001		

Weather

Temperature °F	Precipitation	Wind Speed mph	Wind Direciton	Sky
7	None	7	NE	Sunny

Depth to Bottom (Initial):	34.71 ft.	Date(s) Installed:	Driller:	Cascade	
Depth to Bottom (Final):	35.06 ft.	06/15/2019	Well Diameter:	2	in.
Depth to Water (Initial)	21.73 ft.	Date(s) Developed:			
Depth to Water (Final):	21.81 ft.	06/18/2019	Development Times		
Measuring Point:	Top of Casing		Start	08:04	
Pump Setting (Intake):	29		Stop:	09:07	
Water Column Volume:	2.11 gal.		Total:	63 min.	

Reading #	Volume Removed Gallons	Temp. °C	pH s.u.	Conductivity mS/cm	Turbidity NTU	Approximate Flow Rate gal/min	DTW ft.	Appearance of Water Color	Odor
Start	0	-	-	-	-	1.2	21.49	brown	organic
1	76	7.8	6.65	0.259	29.9	1.5	24.95	clear	none
2	80	7.4	6.63	0.256	50.3	1.5	24.95	clear	none
3	83	7.6	6.61	0.215	40.1	1.5	24.96	clear	none

Total volume of Development water removed: (gallons) 83

Development Water Characteristics:

Physical Appearance at start		Physical Appearance at end	
Color:	brown	Color:	clear
Odor:	organic	Odor:	none
Sheen/Free Product:	-	Sheen/Free Product:	No

Notes:
25 gal of PFAS-FREE water added during drilling. Removed 3x volumes added.
Surged well screen for 10 mins.
Removed >3well volumes

Geologist Signature: KMW

WELL DEVELOPMENT LOG

Well ID:	BRLTN03-MW01D		
Date:	06/14/2019	Field Personnel:	Dan Chamberland
Site Name:	Burlington	Contractor:	Cascade- bill lindsey
AOC:	3	Evacuation Method	surge block|air lift
Project No.:	30001		

Weather

Temperature °F	Precipitation	Wind Speed mph	Wind Direciton	Sky
65	None	20	S	Partly Cloudy

Depth to Bottom (Initial):	78.45 ft.	Date(s) Installed:	Driller:	Cascade	
Depth to Bottom (Final):	80.45 ft.	06/03/2019-06/05/2019	Well Diameter:	2	in.
Depth to Water (Initial)	58 ft.	Date(s) Developed:			
Depth to Water (Final):	78.95 ft.	06/14/2019 to 06/16/2019	Development Times		
Measuring Point:	Top of Casing		Start	08:25	
Pump Setting (Intake):	78		Stop:	07:48	
Water Column Volume:	3.33 gal.		Total:	158* min.	

Well Volumes	Volume Removed Gallons	Temp. °C	pH s.u.	Conductivity mS/cm	Turbidity NTU	Approximate Flow Rate gal/min	DTW ft.	Appearance of Water Color	Odor
Start	3	14.2	8.89	0.182	9999	0.1	76.5	brown	none
1	14	12.7	7.95	0.096	9999	0.25	78.1	brown	none
2	13.9	12.3	8.83	0.13	9999	0.25	62.72	brown	none

Total volume of Development water removed: (gallons) 33.9

Development Water Characteristics:

Physical Appearance at start		Physical Appearance at end	
Color:	brown	Color:	brown
Odor:	none	Odor:	none
Sheen/Free Product:	-	Sheen/Free Product:	-

WELL DEVELOPMENT LOG

Notes:

20 gallons of water was added while drilling, we will remove 60 gallons before purging 3 well volumes. Surge well for 15 minutes before purging. Begin airlifting at 10:05. Air lift was not working, we will switch over to using the waterra.

Purged well dry a second time @ 1710 on 6/14/19. Second purge yielded ~2 gallons of water. Initial DtW: 61.31 ft from TOC. Final DtW: 71.73 ft from TOC. End of day edit: Did not realize that well wasn't purged completely dry this afternoon. Going to purge dry in the morning and purge dry again tomorrow afternoon.

Purged well with Waterra @ 810 on 6/15/19. Purged ~4.5 gallons with Waterra, then switched to the Hurricane SS pump to purge well dry. Purged ~6.5 gallons with Hurricane pump. ~11 gallons total. Initial DtW: 61.25 ft from TOC. Final DtW: 78.1 ft from TOC.
purge parameters:
Flow rate: 1000
pH: 7.95
ORP: -426.9
DO: 0.63
C: 0.096
T: 12.7
Water extremely turbid.

Began purge @ 10:48 on 6/15/19. Initial DtW: 62.72 ft from TOC. Purged ~7 gallons via submersible Hurricane SS pump.
Purge parameters:
Flow rate: 1000 mL/min
pH: 8.83
ORP: -242.5
DO: 1.25
C: 0.130
T: 12.3
Water extremely turbid.

Geologist Signature:



WELL DEVELOPMENT LOG

Well ID:	BRLTN03-MW01S		
Date:	06/13/2019	Field Personnel:	Dan Chamberland, Aaron Sutton
Site Name:	Burlington	Contractor:	Cascade
AOC:	3	Evacuation Method	surge block|waterra
Project No.:	30001		

Weather

Temperature °F	Precipitation	Wind Speed mph	Wind Direciton	Sky
65	None	15	E	Partly Cloudy

Depth to Bottom (Initial):	21.99 ft.	Date(s) Installed:	Driller:	Cascade	
Depth to Bottom (Final):	22.29 ft.	06/05/2019	Well Diameter:	2	in.
Depth to Water (Initial)	13.89 ft.	Date(s) Developed:			
Depth to Water (Final):	14.96 ft.	06/13/2019	Development Times		
Measuring Point:	Top of Casing		Start	13:47	
Pump Setting (Intake):	21.9		Stop:	14:53	
Water Column Volume:	1.32 gal.		Total:	65.4 min.	

Well Volumes	Volume Removed Gallons	Temp. °C	pH s.u.	Conductivity mS/cm	Turbidity NTU	Approximate Flow Rate gal/min	DTW ft.	Appearance of Water Color	Odor
Start	0	11.9	6.85	0.99	9999	2	16	brown	none
1	0.7	11.1	7.31	0.442	999999	0.5	15.82	brown	none
2	1.4	10.6	6.31	0.59	99999	2	16.33	brown	none
3	2.1	10.7	6.4	0.61	99999	2	14.96	brown	none

Total volume of Development water removed: (gallons) 49.2

Development Water Characteristics:

Physical Appearance at start		Physical Appearance at end	
Color:	brown	Color:	brown
Odor:	none	Odor:	none
Sheen/Free Product:	No	Sheen/Free Product:	No

Notes: Begin surging well at 13:55, complete surging at 14:10. 15 gallons were added to this well so we will purge 45 gallons and then begin collecting parameters on three well volumes.

Geologist Signature:

WELL DEVELOPMENT LOG

Well ID:	BRLTN04-MW01D		
Date:	06/27/2019	Field Personnel:	Dan Chamberland, Kylah Wyatt
Site Name:	Burlington	Contractor:	Cascade
AOC:	4	Evacuation Method	submersible pump|surge block|waterra
Project No.:	30001		

Weather

Temperature °F	Precipitation	Wind Speed mph	Wind Direciton	Sky
74	None	10	N	Partly Cloudy

Depth to Bottom (Initial):	71.2 ft.	Date(s) Installed:		Driller:	Cascade
Depth to Bottom (Final):	74.24 ft.	6/24/2019		Well Diameter:	2 in.
Depth to Water (Initial)	15.34 ft.	Date(s) Developed:			
Depth to Water (Final):	73.2 ft.	06/27/2019 to 07/02/2019		Development Times	
Measuring Point:	Top of Casing			Start:	09:55
Pump Setting (Intake):	70			Stop:	14:32
Water Column Volume:	9.11 gal.			Total:	32.4* min.

Reading #	Volume Removed Gallons	Temp. °C	pH s.u.	Conductivity mS/cm	Turbidity NTU	Approximate Flow Rate gal/min	DTW ft.	Appearance of Water Color	Odor
Start	15	15.6	10.94	0.495	9999	1	51.35	brown	none
1	-	-	-	-	-	-	-	-	-
2	22	20.6	9.9	0.235	1E+08	0.5	63.42	grey	none
3	27	18.13	11.57	1.23	99999	1	73	grey	none

Total volume of Development water removed: (gallons) 27

Development Water Characteristics:

Physical Appearance at start		Physical Appearance at end	
Color:	brown	Color:	grey
Odor:	none	Odor:	none
Sheen/Free Product:	-	Sheen/Free Product:	No

Notes:

We added 75 gallons of water to the screen interval during drilling. Will attempt to purge 225 gallons before 3 well volumes.
25 gallons purged before well went dry the first time.
6/28/19 12:10: DTW 23.97 FT BTOC, 85% recovered. Purged until dry, for the second time.
6/30/19 7:30: DTW 69.12 ft BTOC, TD 74.30 ft btoc
7/2/19 8:05: DTW 63.25 FT BTOC. WATTERRA PUMP ON
8:10 DTW 73.20, DRY FOR 3RD TIME
*Development spanned multiple days, causing times and duration to be calculated incorrectly

Geologist Signature:



WELL DEVELOPMENT LOG

Well ID:	BRLTN04-MW01S		
Date:	06/27/2019	Field Personnel:	Dan Chamberland
Site Name:	Burlington	Contractor:	Cascade
AOC:	4	Evacuation Method:	submersible pump|surge block
Project No.:	30001		

Weather

Temperature °F	Precipitation	Wind Speed mph	Wind Direciton	Sky
75	None	10	N	Partly Cloudy

Depth to Bottom (Initial):	24.1 ft.	Date(s) Installed:		Driller:	Cascade
Depth to Bottom (Final):	24.85 ft.	6/25/2019		Well Diameter:	2 in.
Depth to Water (Initial)	13.4 ft.	Date(s) Developed:			
Depth to Water (Final):	12.15 ft.	06/27/2019		Development Times	
Measuring Point:	Top of Casing			Start:	10:42
Pump Setting (Intake):	24			Stop:	11:17
Water Column Volume:	1.74 gal.			Total:	35.2 min.

Reading #	Volume Removed Gallons	Temp. °C	pH s.u.	Conductivity mS/cm	Turbidity NTU	Approximate Flow Rate gal/min	DTW ft.	Appearance of Water Color	Odor
Start	0	12.7	12.9	4.74	9999	1	14.5	brown	none
1	2.5	8	13.15	4.43	460	1.5	13.4	clear	none
2	5	5.9	13.2	4	15.2	1.5	17.1	clear	none
3	9	7.7	13.16	3.75	21.6	1.5	15.8	clear	none

Total volume of Development water removed: (gallons) 9

Development Water Characteristics:

Physical Appearance at start		Physical Appearance at end	
Color:	brown	Color:	clear
Odor:	none	Odor:	none
Sheen/Free Product:	No	Sheen/Free Product:	No

Notes: Surged for ten minutes before purging. Purged extra volume to account for drawdown.

Geologist Signature:



WELL DEVELOPMENT LOG

Well ID:	BRLTNDG-MW01D		
Date:	06/16/2019	Field Personnel:	Dan Chamberland, Aaron Sutton, Kylah Wyatt
Site Name:	Burlington	Contractor:	Cascade
AOC:	Downgradient	Evacuation Method:	surge block | submersible pump
Project No.:	30001		

Weather

Temperature °F	Precipitation	Wind Speed mph	Wind Direciton	Sky
71	None	5	N	Sunny

Depth to Bottom (Initial):	75.33 ft.	Date(s) Installed:		Driller:	Cascade
Depth to Bottom (Final):	75.44 ft.	6/13/2019		Well Diameter:	2 in.
Depth to Water (Initial)	53.72 ft.	Date(s) Developed:			
Depth to Water (Final):	54.76 ft.	06/16/2019		Development Times	
Measuring Point:	Top of Casing			Start	10:17
Pump Setting (Intake):	72.8			Stop:	13:52
Water Column Volume:	3.52 gal.			Total:	215.3 min.

Well Volumes	Volume Removed Gallons	Temp. °C	pH s.u.	Conductivity mS/cm	Turbidity NTU	Approximate Flow Rate gal/min	DTW ft.	Appearance of Water Color	Odor
Start	0	-	-	-	-	-	-	-	-
1	20	13.1	7.03	0.64	518	1.5	54.61		none
2	45	13	7.16	0.64	57.9	1.2	54.7	brown	none
3	60	13	7.74	0.496	25.4	1.5	54.72	brown	none
4	65	13.6	7.35	0.64	70.9	1	54.45	brown	none
5	70	13.1	7.35	0.65	20.9	1	54.73	brown	none
6	75	13.3	7.4	0.6	22.9	1	54.6	brown	none

Total volume of Development water removed: (gallons) 75

Development Water Characteristics:

Physical Appearance at start		Physical Appearance at end	
Color:	-	Color:	brown
Odor:	-	Odor:	none
Sheen/Free Product:	-	Sheen/Free Product:	No

Notes: 20 gallons of PFAS-FREE water from Base added to well during drilling. 5 ft screen. Surged screen interval for 10 mins.
Purged 15 gal with waterra, minor amount of sediment. DTW post waterra: 53.75 ft btoc
Switching to hurricane pump for remainder of development. Initial pump rate 1.2 L/min.

Geologist Signature: KMW

WELL DEVELOPMENT LOG

Well ID:	BRLTNDG-MW01S		
Date:	06/16/2019	Field Personnel:	Dan Chamberland, Aaron Sutton
Site Name:	Burlington	Contractor:	Cascade
AOC:	Downgradient	Evacuation Method	submersible pump
Project No.:	30001		

Weather

Temperature °F	Precipitation	Wind Speed mph	Wind Direciton	Sky
70	None	5	N	Partly Cloudy

Depth to Bottom (Initial):	59.63 ft.	Date(s) Installed:		Driller:	Cascade
Depth to Bottom (Final):	59.8 ft.	6/13/2019		Well Diameter:	2 in.
Depth to Water (Initial)	53.64 ft.	Date(s) Developed:			
Depth to Water (Final):	54.6 ft.	06/16/2019		Development Times	
Measuring Point:	Top of Casing			Start	12:50
Pump Setting (Intake):	59			Stop:	15:15
Water Column Volume:	0.98 gal.			Total:	144.6 min.

Well Volumes	Volume Removed Gallons	Temp. °C	pH s.u.	Conductivity mS/cm	Turbidity NTU	Approximate Flow Rate gal/min	DTW ft.	Appearance of Water Color	Odor
Start	0	13.5	7.26	0.276	9999	2	54.85	brown	none
1	25	12.5	7.13	0.449	20.7	0.8	56.76	clear	none
2	25	12.4	6.61	0.439	9999	0.8	56.55	brown	none
3	25	12.3	6.43	0.449	21.9	0.8	57.34	clear	none
4	1.6	12.4	6.43	0.449	18.6	0.8	57.48	clear	none
5	1.6	12.4	6.43	0.449	17.4	0.8	57.41	clear	none
6	1.6	12.4	6.44	0.449	16.8	0.8	57.42	clear	none

Total volume of Development water removed: (gallons) 79.8

Development Water Characteristics:

Physical Appearance at start		Physical Appearance at end	
Color:	brown	Color:	clear
Odor:	none	Odor:	none
Sheen/Free Product:	Yes	Sheen/Free Product:	-

Notes: 25 gallons added by drilling operations, will purge 75 gallons before our three well volumes. VERY light sheen.

Geologist Signature:



WELL DEVELOPMENT LOG

Well ID:	BRLTNDG-MW02S		
Date:	07/08/2019	Field Personnel:	Dan Chamberland, Jessica Click
Site Name:	Burlington	Contractor:	Parsons
AOC:	Downgradient	Evacuation Method:	surge block|waterra
Project No.:	30001		

Weather

Temperature °F	Precipitation	Wind Speed mph	Wind Direciton	Sky
65	None	0	Variable	Sunny

Depth to Bottom (Initial):	14.23 ft.	Date(s) Installed:		Driller:	Cascade
Depth to Bottom (Final):	14.89 ft.	6/28/2019		Well Diameter:	2 in.
Depth to Water (Initial)	11.98 ft.	Date(s) Developed:			
Depth to Water (Final):	13.71 ft.	07/08/2019 to 07/10/2019		Development Times	
Measuring Point:	Top of Casing			Start:	07:04
Pump Setting (Intake):	14			Stop:	04:58
Water Column Volume:	0.37 gal.			Total:	0* min.

Reading #	Volume Removed Gallons	Temp. °C	pH s.u.	Conductivity mS/cm	Turbidity NTU	Approximate Flow Rate gal/min	DTW ft.	Appearance of Water Color	Odor
Start	2	13.1	7.1	0.246	9999	1	13.52	brown	none
1	1	13.4	6.83	0.231	9999	1	13.43	brown	none
2	1.5	12.7	7.16	0.251	9999	1	13.71	brown	none

Total volume of Development water removed: (gallons) 4.5

Development Water Characteristics:

Physical Appearance at start		Physical Appearance at end	
Color:	brown	Color:	brown
Odor:	none	Odor:	none
Sheen/Free Product:	-	Sheen/Free Product:	No

Notes: 25 gallons added during drilling, will remove 75 gallons and then 3 well volumes. Well surged for 15 minutes. Well purged dry after two gallons of pumping. Well recovered the morning of 7/9, purged dry after 1 gallon. 7/10: well has recovered sufficiently, purge 1.5 gallons for the third purge volume. *Development spanned multiple days, causing the times and duration to be calculated incorrectly

Geologist Signature:



WELL DEVELOPMENT LOG

Well ID:	BRLTNDG-MW03D		
Date:	07/08/2019	Field Personnel:	Dan Chamberland
Site Name:	Burlington	Contractor:	Parsons
AOC:	Downgradient	Evacuation Method:	surge block|waterra
Project No.:	30001		

Weather

Temperature °F	Precipitation	Wind Speed mph	Wind Direciton	Sky
75	None	0	Variable	Sunny

Depth to Bottom (Initial):	33.13 ft.	Date(s) Installed:		Driller:	Cascade
Depth to Bottom (Final):	33.14 ft.	07/01/2019		Well Diameter:	2 in.
Depth to Water (Initial)	10.9 ft.	Date(s) Developed:			
Depth to Water (Final):	30.57 ft.	07/08/2019 to 07/10/2019		Development Times	
Measuring Point:	Top of Casing			Start:	13:49
Pump Setting (Intake):	33			Stop:	06:34
Water Column Volume:	3.6 gal.			Total:	0* min.

Reading #	Volume Removed Gallons	Temp. °C	pH s.u.	Conductivity mS/cm	Turbidity NTU	Approximate Flow Rate gal/min	DTW ft.	Appearance of Water Color	Odor
Start	18	16.4	8.35	0.323	9999	1.5	29.61	brown	none
1	11	13.3	7.43	0.357	9999	2	29.92	brown	none
2	13	15.2	7.74	0.491	9999	3	30.57	brown	none

Total volume of Development water removed: (gallons) 42

Development Water Characteristics:

Physical Appearance at start		Physical Appearance at end	
Color:	brown	Color:	brown
Odor:	none	Odor:	none
Sheen/Free Product:	-	Sheen/Free Product:	No

Notes: Surge for 15 minutes. 125 gallons purged during drilling, purge 375 gallons. Pump at 1.5 gpm starting at 16:30. Well recovered to 11.82 feet 07/09 AM. 7/10: water recovered to 11.97, well purged dry 3 times.
*Development spanned multiple days, causing times and duration to be calculated incorrectly

Geologist Signature:

WELL DEVELOPMENT LOG

Well ID:	BRLTNDG-MW03S		
Date:	07/08/2019	Field Personnel:	Dan Chamberland, Jessica Click
Site Name:	Burlington	Contractor:	Parsons
AOC:	Downgradient	Evacuation Method:	surge block|waterra
Project No.:	30001		

Weather

Temperature °F	Precipitation	Wind Speed mph	Wind Direciton	Sky
75	None	5	W	Sunny

Depth to Bottom (Initial):	11.63 ft.	Date(s) Installed:	Driller:	Cascade.	
Depth to Bottom (Final):	12.02 ft.	07/02/2019	Well Diameter:	2	in.
Depth to Water (Initial)	2.03 ft.	Date(s) Developed:			
Depth to Water (Final):	11.45 ft.	07/08/2019 to 07/11/2019	Development Times		
Measuring Point:	Top of Casing		Start:	14:22	
Pump Setting (Intake):	11		Stop:	06:22	
Water Column Volume:	1.57 gal.		Total:	0* min.	

Reading #	Volume Removed Gallons	Temp. °C	pH s.u.	Conductivity mS/cm	Turbidity NTU	Approximate Flow Rate gal/min	DTW ft.	Appearance of Water Color	Odor
Start	2.5	18.6	7.99	0.344	9999	1.5	10.25	brown	none
1	2.5	15.8	7.83	0.392	9999	2	10.68	brown	none
2	1	20	7.74	0.384	9999	1	11.45	brown	none

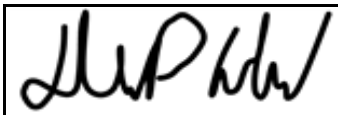
Total volume of Development water removed: (gallons) 6

Development Water Characteristics:

Physical Appearance at start		Physical Appearance at end	
Color:	brown	Color:	brown
Odor:	none	Odor:	none
Sheen/Free Product:	-	Sheen/Free Product:	No

Notes: Well not recovered after 36 hours, will purge dry anyway. 7/11 well under pressure, has recovered to 10.04.
*Development spanned multiple days, causing times and duration to be calculated incorrectly

Geologist Signature:



WELL DEVELOPMENT LOG

Well ID:	BRLTNDG-MW04D		
Date:	07/01/2019	Field Personnel:	Kylah Wyatt
Site Name:	Burlington	Contractor:	Cascade
AOC:	Downgradient	Evacuation Method:	surge block|waterra
Project No.:	30001		

Weather

Temperature °F	Precipitation	Wind Speed mph	Wind Direciton	Sky
80	None	10	N	Sunny

Depth to Bottom (Initial):	24.32 ft.	Date(s) Installed:		Driller:	Cascade
Depth to Bottom (Final):	24.35 ft.	06/28/2019		Well Diameter:	2 in.
Depth to Water (Initial)	9.34 ft.	Date(s) Developed:			
Depth to Water (Final):	12.47 ft.	07/01/2019		Development Times	
Measuring Point:	Top of Casing			Start:	13:45
Pump Setting (Intake):	23.7			Stop:	14:29
Water Column Volume:	2.44 gal.			Total:	42.7 min.

Reading #	Volume Removed Gallons	Temp. °C	pH s.u.	Conductivity mS/cm	Turbidity NTU	Approximate Flow Rate gal/min	DTW ft.	Appearance of Water Color	Odor
Start	-	-	-	-	-	-	-	-	-
1	3	19.7	6.71	2.63	9999999	2	-	black	organic
2	78	14.3	7.1	0.68	1E+08	2	-	clear	none
3	84	13.6	6.74	0.61	1E+08	2	-	brown	none
4	90	13.5	6.68	0.6	9999999	2	14.7	brown	none

Total volume of Development water removed: (gallons) 90

Development Water Characteristics:

Physical Appearance at start		Physical Appearance at end	
Color:	-	Color:	brown
Odor:	-	Odor:	none
Sheen/Free Product:	No	Sheen/Free Product:	-

Notes: 25 gal added during development. Attempt to purge 3x volume added prior to development.
Surge 15 mins prior to pumping.
Pump with waterra.

Geologist Signature: KMW

WELL DEVELOPMENT LOG

Well ID: BRLTNDG-MW04S

Date:	07/01/2019	Field Personnel:	Kylah Wyatt
Site Name:	Burlington	Contractor:	Cascade
AOC:	Downgradient	Evacuation Method:	surge block|waterra
Project No.:	30001		

Weather

Temperature °F	Precipitation	Wind Speed mph	Wind Direciton	Sky
80	None	7	NE	Sunny

Depth to Bottom (Initial):	14.55 ft.	Date(s) Installed:		Driller:	Cascade
Depth to Bottom (Final):	14.57 ft.	06/28/2019		Well Diameter:	2 in.
Depth to Water (Initial)	2.8 ft.	Date(s) Developed:			
Depth to Water (Final):	13.85 ft.	07/01/2019		Development Times	
Measuring Point:	Top of Casing			Start:	11:00
Pump Setting (Intake):	14.5			Stop:	13:34
Water Column Volume:	1.92 gal.			Total:	155 min.

Reading #	Volume Removed Gallons	Temp. °C	pH s.u.	Conductivity mS/cm	Turbidity NTU	Approximate Flow Rate gal/min	DTW ft.	Appearance of Water Color	Odor
Start	-	-	-	-	-	-	-	-	-
1	7	21.3	6.53	2.24	9999999	1	-	black	organic
2	18	29.7	6.73	3.5	1E+08	1	-	black	organic
3	25	19.5	6.68	2.9	999999	1	-	brown	organic

Total volume of Development water removed: (gallons) 25

Development Water Characteristics:

Physical Appearance at start		Physical Appearance at end	
Color:	-	Color:	brown
Odor:	-	Odor:	organic
Sheen/Free Product:	No	Sheen/Free Product:	-

Notes:

25 gal water added in screen interval during drilling. Attempt to remove 3x water added prior to well development.
Surge for 10 mins prior to purge.
Waterra pump on at 7/1/19 14:00. Well dry at 14:20, DTW 12.98 FT BTOC (1st dry out)
14:55, DTW 4.75 ft btoc (>80% recovered), pump on
15:15, DTW 13.2 ft btoc (2nd dry out)
16:10, DTW 4.79 ft btoc, pump on
16:37 DTW 13.6 ft btoc, wellmis dry x3

Geologist Signature: KMW

WELL DEVELOPMENT LOG

Well ID:	BRLTNDG-MW05D		
Date:	07/08/2019	Field Personnel:	Dan Chamberland
Site Name:	Burlington	Contractor:	Parsons
AOC:	Downgradient	Evacuation Method:	surge block|waterra
Project No.:	30001		

Weather

Temperature °F	Precipitation	Wind Speed mph	Wind Direciton	Sky
70	None	5	Variable	Sunny

Depth to Bottom (Initial):	32.13 ft.	Date(s) Installed:		Driller:	Cascade
Depth to Bottom (Final):	35.6 ft.	07/02/2019		Well Diameter:	2 in.
Depth to Water (Initial)	20.36 ft.	Date(s) Developed:			
Depth to Water (Final):	34.8 ft.	07/08/2019 to 07/11/2019		Development Times	
Measuring Point:	Top of Casing			Start	10:07
Pump Setting (Intake):	32			Stop:	06:09
Water Column Volume:	1.92 gal.			Total:	15.7* min.

Reading #	Volume Removed Gallons	Temp. °C	pH s.u.	Conductivity mS/cm	Turbidity NTU	Approximate Flow Rate gal/min	DTW ft.	Appearance of Water Color	Odor
Start	3	28.4	10.55	0.386	9999	1	30.83	brown	none
1	2	28.8	9.76	0.251	9999	1	31.9	brown	none
2	4	13.9	8.24	0.276	99999	-	34.8	brown	none
3	4	15.2	7.87	0.262	9999	2	34.95	brown	none

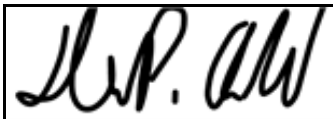
Total volume of Development water removed: (gallons) 13

Development Water Characteristics:

Physical Appearance at start		Physical Appearance at end	
Color:	brown	Color:	brown
Odor:	none	Odor:	none
Sheen/Free Product:	-	Sheen/Free Product:	-

Notes: Well went dry after two well volumes. 7/10: well has recovered to 20.74, will purge dry. 7/11 well has recovered to 22.62 will purge dry and finish development.
*Development spanned multiple days, causing times and duration to be calculated incorrectly

Geologist Signature:



WELL DEVELOPMENT LOG

Well ID:	BRLTNDG-MW05S		
Date:	07/08/2019	Field Personnel:	Dan Chamberland, Jessica Click
Site Name:	Burlington	Contractor:	Parsons
AOC:	Downgradient	Evacuation Method:	waterra
Project No.:	30001		

Weather

Temperature °F	Precipitation	Wind Speed mph	Wind Direciton	Sky
80	None	2	W	Sunny

Depth to Bottom (Initial):	16.67 ft.	Date(s) Installed:		Driller:	Cascade
Depth to Bottom (Final):	16.67 ft.	07/02/2019		Well Diameter:	2 in.
Depth to Water (Initial)	15.1 ft.	Date(s) Developed:			
Depth to Water (Final):	15.1 ft.	07/08/2019		Development Times	
Measuring Point:	Top of Casing			Start:	08:52
Pump Setting (Intake):	16			Stop:	09:11
Water Column Volume:	0.26 gal.			Total:	19.7 min.

Reading #	Volume Removed Gallons	Temp. °C	pH s.u.	Conductivity mS/cm	Turbidity NTU	Approximate Flow Rate gal/min	DTW ft.	Appearance of Water Color	Odor
Start	6	15.3	7.24	0.66	9999	1	15.08	brown	none
1	2	13.7	6.66	0.62	9999	2	15.05	brown	none
2	2	12.8	6.73	0.61	9999	1	15.05	brown	none
3	2	12.9	6.9	0.6	944	1	15.1	brown	none

Total volume of Development water removed: (gallons) 12

Development Water Characteristics:

Physical Appearance at start		Physical Appearance at end	
Color:	brown	Color:	brown
Odor:	none	Odor:	none
Sheen/Free Product:	No	Sheen/Free Product:	-

Notes: Added 2 gallons lab water to well with little change to water level. Surged well for 15 minutes. Purged out 3x the volume of water added then collected readings and well volumes.

Geologist Signature:



WELL DEVELOPMENT LOG

Well ID:	BRLTNUP-MW01D		
Date:	06/29/2019	Field Personnel:	Dan Chamberland, Kylah Wyatt
Site Name:	Burlington	Contractor:	Parsons
AOC:	Upgradient	Evacuation Method	surge block|waterra
Project No.:	30001		

Weather

Temperature °F	Precipitation	Wind Speed mph	Wind Direciton	Sky
65	None	5	NW	Mostly Cloudy

Depth to Bottom (Initial):	58.55 ft.	Date(s) Installed:		Driller:	Cascade
Depth to Bottom (Final):	57.43 ft.	06/26/2019		Well Diameter:	2 in.
Depth to Water (Initial)	10.43 ft.	Date(s) Developed:			
Depth to Water (Final):	15.45 ft.	06/29/2019		Development Times	
Measuring Point:	Top of Casing			Start	08:53
Pump Setting (Intake):	58			Stop:	11:24
Water Column Volume:	7.84 gal.			Total:	151.6 min.

Reading #	Volume Removed Gallons	Temp. °C	pH s.u.	Conductivity mS/cm	Turbidity NTU	Approximate Flow Rate gal/min	DTW ft.	Appearance of Water Color	Odor
Start	5	14.8	9.96	0.199	9999	1	32.5	brown	none
1	165	15	8.66	0.489	9999	1.06	42.7	brown	none
2	175	13.1	8.47	0.473	9999	1.06	34.24	brown	none
3	185	15.2	8.38	0.325	9999	1.06	40.57	brown	none
4	195	15.8	8.41	0.481	9999	1.06	35.72	brown	none

Total volume of Development water removed: (gallons) 195

Development Water Characteristics:

Physical Appearance at start		Physical Appearance at end	
Color:	brown	Color:	brown
Odor:	none	Odor:	none
Sheen/Free Product:	No	Sheen/Free Product:	No

Notes: 55 gallons of water added during drilling into the screened interval. Will purge 165 gallons before purging three well volumes. Using mechanical waterra pump. Surged for 15 minutes before pumping.

Geologist Signature:



WELL DEVELOPMENT LOG

Well ID:	BTV-MW-5		
Date:	06/04/2019	Field Personnel:	Dan Chamberland, Aaron Sutton
Site Name:	Burlington	Contractor:	Parsons
AOC:	4	Evacuation Method	submersible pump
Project No.:	30001		

Weather

Temperature °F	Precipitation	Wind Speed mph	Wind Direciton	Sky
66	None	6	E	Mostly Cloudy

Depth to Bottom (Initial):	14.23 ft.	Date(s) Installed:		Driller:	N/A
Depth to Bottom (Final):	- ft.	Unknown - Exisiting Well		Well Diameter:	2 in.
Depth to Water (Initial)	10.23 ft.	Date(s) Developed:			
Depth to Water (Final):	11.48 ft.	06/04/2019		Development Times	
Measuring Point:	Top of Casing			Start:	13:37
Pump Setting (Intake):	13.7			Stop:	13:48
Water Column Volume:	0.65			Total:	11.7 min.

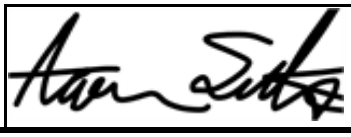
Well Volumes	Volume Removed Gallons	Temp. °C	pH s.u.	Conductivity mS/cm	Turbidity NTU	Approximate Flow Rate gal/min	DTW ft.	Appearance of Water Color	Odor
Start	1	11.1	7.58	0.063	122	1	12.15	clear	none
1	2.5	9.2	7.22	0.048	80.7	1	12.1	clear	none
2	4	9.4	6.77	0.048	9999999	1	12	brown	none
3	5.5	9.5	6.3	0.048	1E+08	1	11.5	brown	none
4	7	9.6	6.07	0.049	9999999	1	11.48	brown	none

Total volume of Development water removed: (gallons) 7

Development Water Characteristics:

Physical Appearance at start		Physical Appearance at end	
Color:	clear	Color:	brown
Odor:	none	Odor:	none
Sheen/Free Product:	No	Sheen/Free Product:	No

Notes: Clear for first 4 gallons, then excessively turbid for the next 3.5 gallons.

Geologist Signature: 

WELL DEVELOPMENT LOG

Well ID:	BTV-MW-9		
Date:	06/05/2019	Field Personnel:	Dan Chamberland, Aaron Sutton
Site Name:	Burlington	Contractor:	Parsons
AOC:	5	Evacuation Method	submersible pump
Project No.:	30001		

Weather

Temperature °F	Precipitation	Wind Speed mph	Wind Direciton	Sky
65	None	5	E	Mostly Cloudy

Depth to Bottom (Initial):	32.88 ft.	Date(s) Installed:	Unknown - Existing Well	Driller:	N/A
Depth to Bottom (Final):	32.88 ft.			Well Diameter:	2 in.
Depth to Water (Initial)	21.6 ft.	Date(s) Developed:			
Depth to Water (Final):	22.54 ft.	06/05/2019		Development Times	
Measuring Point:	Top of Casing			Start	11:40
Pump Setting (Intake):	32.4			Stop:	11:49
Water Column Volume:	1.84 gal.			Total:	8.9 min.

Well Volumes	Volume Removed Gallons	Temp. °C	pH s.u.	Conductivity mS/cm	Turbidity NTU	Approximate Flow Rate gal/min	DTW ft.	Appearance of Water Color	Odor
Start	0	9.2	8.01	0.355	44.9	1	24.13	clear	none
1	1.1	8.2	7.18	0.348	43.5	1	25.73	clear	none
2	2.2	7.6	6.9	0.397	24.2	1	26.74	clear	none
3	3.3	7.3	6.91	0.255	10.2	1	27.22	clear	none

Total volume of Development water removed: (gallons) 3.3

Development Water Characteristics:

Physical Appearance at start		Physical Appearance at end	
Color:	clear	Color:	clear
Odor:	none	Odor:	none
Sheen/Free Product:	No	Sheen/Free Product:	No

Notes: -

Geologist Signature: Aaron Sutton

WELL DEVELOPMENT LOG

Well ID:	BTV-MW-14		
Date:	06/05/2019	Field Personnel:	Kylah Wyatt
Site Name:	Burlington	Contractor:	Parsons
AOC:	1	Evacuation Method	submersible pump
Project No.:	30001		

Weather

Temperature °F	Precipitation	Wind Speed mph	Wind Direciton	Sky
68	None	5	NE	Partly Cloudy

Depth to Bottom (Initial):	22.97 ft.	Date(s) Installed:		Driller:	N/A
Depth to Bottom (Final):	23.03 ft.	06/05/2019-06/05/2019		Well Diameter:	2 in.
Depth to Water (Initial)	12.92 ft.	Date(s) Developed:			
Depth to Water (Final):	13.13 ft.	06/05/2019		Development Times	
Measuring Point:	Top of Casing			Start:	11:23
Pump Setting (Intake):	20			Stop:	11:38
Water Column Volume:	1.64 gal.			Total:	14.5 min.

Well Volumes	Volume Removed Gallons	Temp. °C	pH s.u.	Conductivity mS/cm	Turbidity NTU	Approximate Flow Rate gal/min	DTW ft.	Appearance of Water Color	Odor
Start	0	-	-	-	-	-	-	-	-
1	2	10.1	7.51	0.09	176	1	15.2	brown	-
2	3.5	10.1	6.85	0.049	218	0.5	15.45	brown	-
3	3	9.4	6.59	0.029	19.6	0.5	16.35	brown	none

Total volume of Development water removed: (gallons) 5.25

Development Water Characteristics:

Physical Appearance at start		Physical Appearance at end	
Color:	-	Color:	brown
Odor:	-	Odor:	none
Sheen/Free Product:	-	Sheen/Free Product:	No

Notes: Pump cut off a couple times
Bailer in well was removed, placed on clean trash bag, and replaced following development

Geologist Signature: 

WELL DEVELOPMENT LOG

Well ID:	MCW109		
Date:	05/30/2019	Field Personnel:	Kylah Wyatt
Site Name:	Burlington	Contractor:	Parsons
AOC:	2	Evacuation Method	submersible pump
Project No.:	30001		

Weather

Temperature °F	Precipitation	Wind Speed mph	Wind Direciton	Sky
65	None	5	N	Sunny

Depth to Bottom (Initial):	24.59 ft.	Date(s) Installed:		Driller:	N/A
Depth to Bottom (Final):	- ft.	Unknown - Existing Well		Well Diameter:	2 in.
Depth to Water (Initial)	24.44 ft.	Date(s) Developed:			
Depth to Water (Final):	- ft.	6/5/2019		Development Times	
Measuring Point:	Top of Casing			Start	-
Pump Setting (Intake):	0			Stop:	-
Water Column Volume:	0.024 gal.			Total:	- min.

Well Volumes	Volume Removed Gallons	Temp. °C	pH s.u.	Conductivity mS/cm	Turbidity NTU	Approximate Flow Rate gal/min	DTW ft.	Appearance of Water Color	Odor

Total volume of Development water removed: (gallons) 0

Development Water Characteristics:

Physical Appearance at start		Physical Appearance at end	
Color:	-	Color:	-
Odor:	-	Odor:	-
Sheen/Free Product:	-	Sheen/Free Product:	-

Notes: No water in well screen interval. Water is located in well sump and well is effectively dry.

Geologist Signature:



WELL DEVELOPMENT LOG

Well ID:	MW-101		
Date:	06/05/2019	Field Personnel:	Kylah Wyatt
Site Name:	Burlington	Contractor:	Parsons
AOC:	1	Evacuation Method	submersible pump
Project No.:	30001		

Weather

Temperature °F	Precipitation	Wind Speed mph	Wind Direciton	Sky
55	Rain	5	NE	Overcast

Depth to Bottom (Initial):	12.9 ft.	Date(s) Installed:	Driller:	N/A	
Depth to Bottom (Final):	12.98 ft.	Unknown - Existing Well	Well Diameter:	2	in.
Depth to Water (Initial)	3.65 ft.	Date(s) Developed:			
Depth to Water (Final):	5.85 ft.	06/05/2019	Development Times		
Measuring Point:	Top of Casing		Start	08:37	
Pump Setting (Intake):	10		Stop:	08:40	
Water Column Volume:	1.51 gal.		Total:	3.8 min.	

Well Volumes	Volume Removed Gallons	Temp. °C	pH s.u.	Conductivity mS/cm	Turbidity NTU	Approximate Flow Rate gal/min	DTW ft.	Appearance of Water Color	Odor
Start	0	-	-	-	-	-	-	-	-
1	4	10.1	6.88	1.33	138	2	5.85	brown	none

Total volume of Development water removed: (gallons) 6

Development Water Characteristics:

Physical Appearance at start		Physical Appearance at end	
Color:	-	Color:	brown
Odor:	-	Odor:	none
Sheen/Free Product:	-	Sheen/Free Product:	No

Notes: Fast purge watercolor was an orange brown appears to be a spring to the west of the well. Top of casing is approximately 9 inches below the stick up casing top - is difficult to reach

Geologist Signature: 

WELL DEVELOPMENT LOG

Well ID:	MW-105		
Date:	05/31/2019	Field Personnel:	Aaron Sutton, Kylah Wyatt
Site Name:	Burlington	Contractor:	Parsons
AOC:	1	Evacuation Method:	submersible pump
Project No.:	30001		

Weather

Temperature °F	Precipitation	Wind Speed mph	Wind Direciton	Sky
65	None	5	NE	Partly Cloudy

Depth to Bottom (Initial):	97.6 ft.	Date(s) Installed:		Driller:	N/A
Depth to Bottom (Final):	98.12 ft.	Unknown - Existing Well		Well Diameter:	2 in.
Depth to Water (Initial):	10.12 ft.	Date(s) Developed:			
Depth to Water (Final):	60.92 ft.	05/31/2019 to 06/01/2019		Development Times	
Measuring Point:	Top of Casing			Start:	08:43*
Pump Setting (Intake):	-			Stop:	07:10*
Water Column Volume:	1.19			Total:	347.2* min.

Well Volumes	Volume Removed Gallons	Temp. °C	pH s.u.	Conductivity mS/cm	Turbidity NTU	Approximate Flow Rate gal/min	DTW ft.	Appearance of Water Color	Odor
Start	0								
1	15	8	6.87	0.8	1E+09	0.2	10.12	brown	none
2	30	8.5	7.12	0.79	999	0.25	-	grey	none
3	47	10.8	7.04	0.78	-	0.5	-	grey	none

Total volume of Development water removed: (gallons) 47

Development Water Characteristics:

Physical Appearance at start		Physical Appearance at end	
Color:	-	Color:	grey
Odor:	-	Odor:	none
Sheen/Free Product:	No	Sheen/Free Product:	-

Notes:

One WV is 14.3. // 3 WV IS 43 GAL

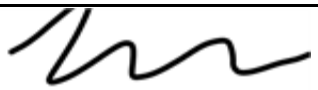
On 5/31/19 purged 30 gallons from well, well is very silty and jammed pump multiple times which required pulling the pump from the well for cleaning. Finished Purge at 17:00 with a depth to water was 84.62 feet below top of casing. Will return June 1st to allow well to recharge add finish development.

Turbidity change from Orange to Brown to gray

June 1st 2019 at 10 a.m. depth to water 16.97 ft btoc pump on at 10:07.

*Development took place over multiple days, causing Start/Stop times to calculate incorrectly

Geologist Signature:



WELL DEVELOPMENT LOG

Well ID:	MW-401		
Date:	06/01/2019	Field Personnel:	Dan Chamberland
Site Name:	Burlington	Contractor:	Parsons
AOC:	2	Evacuation Method	submersible pump
Project No.:	30001		

Weather

Temperature °F	Precipitation	Wind Speed mph	Wind Direciton	Sky
70	None	5	Variable	Sunny

Depth to Bottom (Initial):	36.65 ft.	Date(s) Installed:		Driller:	N/A
Depth to Bottom (Final):	36.65 ft.	Unknown - Existing Well		Well Diameter:	2 in.
Depth to Water (Initial)	25.25 ft.	Date(s) Developed:			
Depth to Water (Final):	25.3 ft.	06/01/2019 to 06/03/2019		Development Times	
Measuring Point:	Top of Casing			Start:	09:18
Pump Setting (Intake):	36			Stop:	04:32
Water Column Volumn:	1.86			Total:	0* min.

Well Volumes	Volume Removed Gallons	Temp. °C	pH s.u.	Conductivity mS/cm	Turbidity NTU	Approximate Flow Rate gal/min	DTW ft.	Appearance of Water Color	Odor
Start	0	-	-	-	-	-	-	clear	none
1	1.8	8.5	6.67	0.85	13.3	0.12	25.25	clear	none
2	3.7	8.3	7.28	0.67	12.5	0.12	25.27	clear	none
3	5.4	8.4	6.88	0.68	2.39	0.12	25.3	clear	none

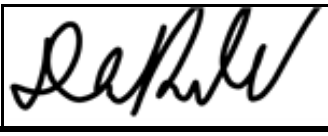
Total volume of Development water removed: (gallons) 5.4

Development Water Characteristics:

Physical Appearance at start		Physical Appearance at end	
Color:	clear	Color:	clear
Odor:	none	Odor:	none
Sheen/Free Product:	-	Sheen/Free Product:	-

Notes: *Development spanned multiple days, causing times and duration to be calculated incorrectly

Geologist Signature:



WELL DEVELOPMENT LOG

Well ID:	MW-403		
Date:	06/01/2019	Field Personnel:	Dan Chamberland
Site Name:	Burlington	Contractor:	Parsons
AOC:	2	Evacuation Method	submersible pump
Project No.:	30001		

Weather

Temperature °F	Precipitation	Wind Speed mph	Wind Direciton	Sky
68	None	5	NW	Sunny

Depth to Bottom (Initial):	36.28 ft.	Date(s) Installed:		Driller:	N/A
Depth to Bottom (Final):	36.3 ft.	Unknown - Existing Well		Well Diameter:	2 in.
Depth to Water (Initial):	20.82 ft.	Date(s) Developed:			
Depth to Water (Final):	22.63 ft.	06/01/2019		Development Times	
Measuring Point:	Top of Casing			Start:	07:35
Pump Setting (Intake):	36.2			Stop:	08:20
Water Column Volume:	2.52			Total:	25* min.

Well Volumes	Volume Removed Gallons	Temp. °C	pH s.u.	Conductivity mS/cm	Turbidity NTU	Approximate Flow Rate gal/min	DTW ft.	Appearance of Water Color	Odor
Start	0	-	-	-	-	-	-	-	-
1	1.8	7.9	7.21	1.02	2.11	500	20.85	clear	none
2	3.5	8.1	6.8	0.92	1.94	500	21	clear	none
3	5.3	7.6	6.75	0.75	0.8	0.13	21.05	clear	none

Total volume of Development water removed: (gallons) 5.3

Development Water Characteristics:

Physical Appearance at start		Physical Appearance at end	
Color:	-	Color:	clear
Odor:	-	Odor:	none
Sheen/Free Product:	-	Sheen/Free Product:	-

Notes: *Time calculated incorrectly

Geologist Signature:



WELL DEVELOPMENT LOG

Well ID:	MW-405		
Date:	06/01/2019	Field Personnel:	Dan Chamberland
Site Name:	Burlington	Contractor:	Parsons
AOC:	2	Evacuation Method	submersible pump
Project No.:	30001		

Weather

Temperature °F	Precipitation	Wind Speed mph	Wind Direciton	Sky
65	None	5	NW	Sunny

Depth to Bottom (Initial):	21.95 ft.	Date(s) Installed:	Driller:	N/A	
Depth to Bottom (Final):	22.28 ft.	Unknown - Existing Well	Well Diameter:	1	in.
Depth to Water (Initial)	15.15 ft.	Date(s) Developed:			
Depth to Water (Final):	18.65 ft.	06/02/2019	Development Times		
Measuring Point:	Top of Casing		Start:	19:22*	
Pump Setting (Intake):	18.5		Stop:	19:27*	
Water Column Volume:	1.11		Total:	56 min.	

Well Volumes	Volume Removed Gallons	Temp. °C	pH s.u.	Conductivity mS/cm	Turbidity NTU	Approximate Flow Rate gal/min	DTW ft.	Appearance of Water Color	Odor
Start	0.3	6.6	6.49	1.29	138	0.13	16.35	black	petrocarbon
1	0.6	6.9	6.84	1.28	22.4	0.13	17.3	black	petrocarbon
2	0.8	6.5	6.8	1.22	18.6	0.13	18.1	clear	petrocarbon

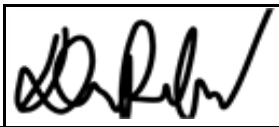
Total volume of Development water removed: (gallons) 0.8

Development Water Characteristics:

Physical Appearance at start		Physical Appearance at end	
Color:	black	Color:	clear
Odor:	petrocarbon	Odor:	petrocarbon
Sheen/Free Product:		Sheen/Free Product:	No

Notes:
*Well development started 06/01/2019 @ 08:55
*Finished at 09:51
1" dia well

Geologist Signature:



WELL DEVELOPMENT LOG

Well ID:	V1-BR-06		
Date:	06/03/2019	Field Personnel:	Dan Chamberland
Site Name:	Burlington	Contractor:	Parsons
AOC:	1	Evacuation Method	submersible pump
Project No.:	30001		

Weather

Temperature °F	Precipitation	Wind Speed mph	Wind Direciton	Sky
65	None	5	W	Partly Cloudy

Depth to Bottom (Initial):	60.94 ft.	Date(s) Installed:	Driller:	N/A	
Depth to Bottom (Final):	60.94 ft.	Unknown - Existing Well	Well Diameter:	6	in.
Depth to Water (Initial)	3.61 ft.	Date(s) Developed:			
Depth to Water (Final):	59.55 ft.	6/3/2019	Development Times		
Measuring Point:	Top of Casing		Start:	21:17	
Pump Setting (Intake):	60		Stop:	21:19	
Water Column Volume:	84.16 gal.		Total:	1.4*	min.

Well Volumes	Volume Removed Gallons	Temp. °C	pH s.u.	Conductivity mS/cm	Turbidity NTU	Approximate Flow Rate gal/min	DTW ft.	Appearance of Water Color	Odor
Start	0	-	-	-	-	0.13	3.61	clear	none
1	85	10.8	12.47	2.64	39.4	0.13	59.55	clear	none

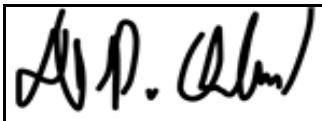
Total volume of Development water removed: (gallons) 85

Development Water Characteristics:

Physical Appearance at start		Physical Appearance at end	
Color:	clear	Color:	clear
Odor:	none	Odor:	none
Sheen/Free Product:	-	Sheen/Free Product:	No

Notes: All water purged from well. No signs of recovery.
*Form created after development activities, time entries not reflective of time spent developing

Geologist Signature:



WELL DEVELOPMENT LOG

Well ID:	V1-BR-08		
Date:	06/05/2019	Field Personnel:	Dan Chamberland, Aaron Sutton
Site Name:	Burlington	Contractor:	Parsons
AOC:	1	Evacuation Method	submersible pump
Project No.:	30001		

Weather

Temperature °F	Precipitation	Wind Speed mph	Wind Direciton	Sky
65	None	0	E	Partly Cloudy

Depth to Bottom (Initial):	49.36 ft.	Date(s) Installed:		Driller:	N/A
Depth to Bottom (Final):	49.36 ft.	Unknown - Existing Well		Well Diameter:	2 in.
Depth to Water (Initial)	28.56 ft.	Date(s) Developed:			
Depth to Water (Final):	28.56 ft.	06/05/2019		Development Times	
Measuring Point:	Top of Casing			Start	10:33
Pump Setting (Intake):	49			Stop:	10:33
Water Column Volume:	3.4 gal.			Total:	0 min.

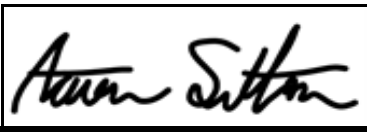
Well Volumes	Volume Removed Gallons	Temp. °C	pH s.u.	Conductivity mS/cm	Turbidity NTU	Approximate Flow Rate gal/min	DTW ft.	Appearance of Water Color	Odor
Start	0	-	-	-	-	0.03	-	clear	none

Total volume of Development water removed: (gallons) 0

Development Water Characteristics:

Physical Appearance at start		Physical Appearance at end	
Color:	clear	Color:	clear
Odor:	none	Odor:	none
Sheen/Free Product:	-	Sheen/Free Product:	-

Notes: Well development stopped due to extremely low flow and an inability to get a submersible pump down the well. Will discuss and come back later.

Geologist Signature: 

WELL DEVELOPMENT LOG

Well ID:	V1-MW1		
Date:	06/04/2019	Field Personnel:	Dan Chamberland, Kylah Wyatt
Site Name:	Burlington	Contractor:	Parsons
AOC:	1	Evacuation Method	submersible pump
Project No.:	30001		

Weather

Temperature °F	Precipitation	Wind Speed mph	Wind Direciton	Sky
66	None	5	NE	Sunny

Depth to Bottom (Initial):	17.52 ft.	Date(s) Installed:		Driller:	N/A
Depth to Bottom (Final):	17.54 ft.	Unknown - Existing Well		Well Diameter:	2 in.
Depth to Water (Initial)	8.11 ft.	Date(s) Developed:			
Depth to Water (Final):	8.11 ft.	06/04/2019		Development Times	
Measuring Point:	Top of Casing			Start:	09:41
Pump Setting (Intake):	15			Stop:	10:02
Water Column Volume:	1.53			Total:	21.9 min.

Well Volumes	Volume Removed Gallons	Temp. °C	pH s.u.	Conductivity mS/cm	Turbidity NTU	Approximate Flow Rate gal/min	DTW ft.	Appearance of Water Color	Odor
Start	0	-	-	-	-	-	-	-	-
1	4	10.1	7.6	0.309	24.5	2	-	brown	none
2	1.9	14.3	6.49	0.339	9999	0.1	-	brown	none

Total volume of Development water removed: (gallons) 5.5

Development Water Characteristics:

Physical Appearance at start		Physical Appearance at end	
Color:	-	Color:	brown
Odor:	-	Odor:	none
Sheen/Free Product:	-	Sheen/Free Product:	No

Notes:

1 wv is 1.53 gal. 3 wv is 4.59 gal

Well ran dry at 3 gal purged, waited 30 mins to recharge for final parameter collection

Fine roots in well

Geologist Signature:

WELL DEVELOPMENT LOG

Well ID:	V1-MW12		
Date:	06/05/2019	Field Personnel:	Dan Chamberland, Aaron Sutton
Site Name:	Burlington	Contractor:	Parsons
AOC:	1	Evacuation Method	submersible pump
Project No.:	30001		

Weather

Temperature °F	Precipitation	Wind Speed mph	Wind Direciton	Sky
60	Rain	3	SW	Overcast

Depth to Bottom (Initial):	25.02 ft.	Date(s) Installed:		Driller:	N/A
Depth to Bottom (Final):	25.02 ft.	Unknown - Existing Well		Well Diameter:	2 in.
Depth to Water (Initial)	13.03 ft.	Date(s) Developed:			
Depth to Water (Final):	20.68 ft.	06/05/2019		Development Times	
Measuring Point:	Top of Casing			Start	06:50
Pump Setting (Intake):	25			Stop:	07:09
Water Column Volume:	0.7 gal.			Total:	19.1 min.

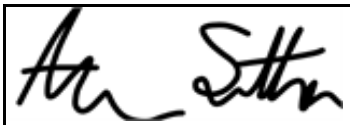
Well Volumes	Volume Removed Gallons	Temp. °C	pH s.u.	Conductivity mS/cm	Turbidity NTU	Approximate Flow Rate gal/min	DTW ft.	Appearance of Water Color	Odor
Start	0	5.3	7.11	0.177	5.3	1	20.5	clear	none
1	4	5.5	5.79	0.259	1.37	1	21.15	clear	none
2	3	5.5	5.87	0.199	1.14	0.7	23	clear	none
3	2	6.5	6.32	0.186	47.4	0.5	24	clear	none

Total volume of Development water removed: (gallons) 9

Development Water Characteristics:

Physical Appearance at start		Physical Appearance at end	
Color:	clear	Color:	clear
Odor:	none	Odor:	none
Sheen/Free Product:	No	Sheen/Free Product:	No

Notes: -

Geologist Signature: 

WELL DEVELOPMENT LOG

Well ID:	V1-MW14		
Date:	06/01/2019	Field Personnel:	Dan Chamberland
Site Name:	Burlington	Contractor:	Parsons
AOC:	1	Evacuation Method	submersible pump
Project No.:	30001		

Weather

Temperature °F	Precipitation	Wind Speed mph	Wind Direciton	Sky
70	None	5	W	Sunny

Depth to Bottom (Initial):	11.85 ft.	Date(s) Installed:		Driller:	N/A
Depth to Bottom (Final):	11.85 ft.	Unknown - Existing Well		Well Diameter:	2 in.
Depth to Water (Initial)	8.45 ft.	Date(s) Developed:			
Depth to Water (Final):	8.42 ft.	6/1/2019		Development Times	
Measuring Point:	Top of Casing			Start	11:10
Pump Setting (Intake):	25			Stop:	11:37
Water Column Volume:	0.6 gal.			Total:	20 min.

Well Volumes	Volume Removed Gallons	Temp. °C	pH s.u.	Conductivity mS/cm	Turbidity NTU	Approximate Flow Rate gal/min	DTW ft.	Appearance of Water Color	Odor
Start	0	-	-	-	-	-	8.45	clear	none
1	0.4	5.5	7.3	0.621	2.6	0.13	8.44	clear	none
2	0.8	5.3	6.34	0.602	1.8	0.13	8.43	clear	none
3	1.2	5.2	6.5	0.594	1.02	0.13	8.42	clear	none

Total volume of Development water removed: (gallons) 1.8

Development Water Characteristics:

Physical Appearance at start		Physical Appearance at end	
Color:	clear	Color:	clear
Odor:	none	Odor:	none
Sheen/Free Product:	No	Sheen/Free Product:	No

Notes: -

Geologist Signature:



WELL DEVELOPMENT LOG

Well ID:	V1-MW-106		
Date:	06/04/2019	Field Personnel:	Dan Chamberland, Kylah Wyatt
Site Name:	Burlington	Contractor:	Parsons
AOC:	1	Evacuation Method	submersible pump
Project No.:	30001		

Weather

Temperature °F	Precipitation	Wind Speed mph	Wind Direciton	Sky
63	None	5	N	Sunny

Depth to Bottom (Initial):	18.02 ft.	Date(s) Installed:	Driller:	N/A	
Depth to Bottom (Final):	18.1 ft.	Unknown - Existing Well	Well Diameter:	2	in.
Depth to Water (Initial)	5.72 ft.	Date(s) Developed:			
Depth to Water (Final):	5.76 ft.	06/04/2019	Development Times		
Measuring Point:	Top of Casing		Start:	08:36	
Pump Setting (Intake):	15		Stop:	08:41	
Water Column Volume:	2		Total:	4.7*	min.

Well Volumes	Volume Removed Gallons	Temp. °C	pH s.u.	Conductivity mS/cm	Turbidity NTU	Approximate Flow Rate gal/min	DTW ft.	Appearance of Water Color	Odor
Start	0	-	-	-	-	-	-	-	-
1	1.3	14.8	7.54	0.846	878	2	-	brown	none
2	4.2	13.4	7.2	0.64	8.15	3	-	clear	none
3	9	14.2	7.31	0.64	4.94	3	5.78	clear	none

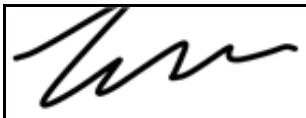
Total volume of Development water removed: (gallons) 9

Development Water Characteristics:

Physical Appearance at start		Physical Appearance at end	
Color:	-	Color:	clear
Odor:	-	Odor:	none
Sheen/Free Product:	-	Sheen/Free Product:	-

Notes: *Actual development time was longer, this time reflects how long it took to fill out the form

Geologist Signature:



WELL DEVELOPMENT LOG

Well ID:	V1-MW-107		
Date:	05/31/2019	Field Personnel:	Aaron Sutton, Kylah Wyatt
Site Name:	Burlington	Contractor:	Parsons
AOC:	1	Evacuation Method:	submersible pump
Project No.:	30001		

Weather

Temperature °F	Precipitation	Wind Speed mph	Wind Direciton	Sky
60	None	0	NW	Partly Cloudy

Depth to Bottom (Initial):	19.4 ft.	Date(s) Installed:		Driller:	N/A
Depth to Bottom (Final):	19.43 ft.	Unknown - Existing Well		Well Diameter:	2 in.
Depth to Water (Initial):	12.16 ft.	Date(s) Developed:			
Depth to Water (Final):	12.7 ft.	05/31/2019		Development Times	
Measuring Point:	Top of Casing			Start:	7:25
Pump Setting (Intake):	17			Stop:	7:25
Water Column Volume:	1.18			Total:	3.5* min.

Well Volumes	Volume Removed Gallons	Temp. °C	pH s.u.	Conductivity mS/cm	Turbidity NTU	Approximate Flow Rate gal/min	DTW ft.	Appearance of Water Color	Odor
Start	4	5.3	6.04	0.45	1E+09	1.25	12.16	brown	none

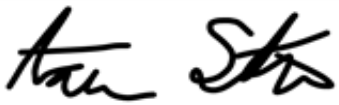
Total volume of Development water removed: (gallons) 4

Development Water Characteristics:

Physical Appearance at start		Physical Appearance at end	
Color:	brown	Color:	brown
Odor:	none	Odor:	none
Sheen/Free Product:	No	Sheen/Free Product:	No

Notes:
Initial PID: 0.02
Well Volume: 1.1584
3 Well Volumes: 3.4752
*First log, figuring out how to input information

Geologist Signature:



WELL DEVELOPMENT LOG

Well ID:	V1-RFW2		
Date:	06/05/2019	Field Personnel:	Dan Chamberland, Aaron Sutton
Site Name:	Burlington	Contractor:	Parsons
AOC:	1	Evacuation Method	submersible pump
Project No.:	30001		

Weather

Temperature °F	Precipitation	Wind Speed mph	Wind Direciton	Sky
60	None	4	SW	Overcast

Depth to Bottom (Initial):	24.72 ft.	Date(s) Installed:		Driller:	N/A
Depth to Bottom (Final):	24.5 ft.	Unknown - Existing Well		Well Diameter:	2 in.
Depth to Water (Initial)	8.48 ft.	Date(s) Developed:			
Depth to Water (Final):	14.2 ft.	06/05/2019		Development Times	
Measuring Point:	Top of Casing			Start:	08:18
Pump Setting (Intake):	24.5			Stop:	09:37
Water Column Volume:	2.65 gal.			Total:	79.4 min.

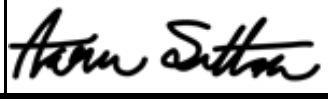
Well Volumes	Volume Removed Gallons	Temp. °C	pH s.u.	Conductivity mS/cm	Turbidity NTU	Approximate Flow Rate gal/min	DTW ft.	Appearance of Water Color	Odor
Start	0	8.9	7.36	0.496	145	1	11.99	grey	none
1	1.1	7.8	7.24	0.499	51	1	17.8	grey	none
2	2.2	8.6	7.53	0.518	58.5	0.16	18	grey	none
3	3.3	11.6	7.82	0.58	9999999	0.06	14.2	grey	none
4	4.4	8.8	7.41	0.469	473	0.5	21.5	grey	none
5	5.5	12.6	7.88	0.359	9999999	0.16	25.02	brown	none

Total volume of Development water removed: (gallons) 5.5

Development Water Characteristics:

Physical Appearance at start		Physical Appearance at end	
Color:	grey	Color:	brown
Odor:	none	Odor:	none
Sheen/Free Product:	No	Sheen/Free Product:	No

Notes: Very low and intermittent flow after first well volume. Had to troubleshoot pump. Pumped the well dry twice. Fast recharge, but pump issues slowed development

Geologist Signature: 

WELL DEVELOPMENT LOG

Well ID:	V4-BR03		
Date:	06/01/2019	Field Personnel:	Aaron Sutton, Kylah Wyatt
Site Name:	Burlington	Contractor:	Parsons
AOC:	4	Evacuation Method	submersible pump
Project No.:	30001		

Weather

Temperature °F	Precipitation	Wind Speed mph	Wind Direciton	Sky
68	None	7	NE	Partly Cloudy

Depth to Bottom (Initial):	118.58 ft.	Date(s) Installed:	Driller:	N/A	
Depth to Bottom (Final):	- ft.	Unknown - Existing Well	Well Diameter:	-	in.
Depth to Water (Initial):	33.69 ft.	Date(s) Developed:			
Depth to Water (Final):	- ft.	06/01/2019 - 06/03/2019	Development Times		
Measuring Point:	TOC		Start:	12:27	
Pump Setting (Intake):	115		Stop:	13:55	
Water Column Volume:	13.84		Total:	0*	min.

Well Volumes	Volume Removed Gallons	Temp. °C	pH s.u.	Conductivity mS/cm	Turbidity NTU	Approximate Flow Rate gal/min	DTW ft.	Appearance of Water Color	Odor
Start	0	-	-	-	-	-	-	-	-
1	40	-	-	-	-	-	-	-	-
2	50	-	-	-	-	-	-	-	-
3	90	11.5	10.57	0.35	786	0.5	107.86	grey	none

Total volume of Development water removed: (gallons) 90

Development Water Characteristics:

Physical Appearance at start		Physical Appearance at end	
Color:	-	Color:	grey
Odor:	-	Odor:	none
Sheen/Free Product:	-	Sheen/Free Product:	No

Notes:

1 WV IS 86.58. 3 WV is 260 gallons
End of day June 1st 2019 purged 40 gallons from well . Depth to water 63.70 btoc at end of pumping, considerable draw down observed.
June 2, 2019 10:20 return to BR03, DTW 56.09 FT BTOC. Purged 10 gal (50 gal total). PUMP FOULED, motor wet. Pull pump to allow to dry out.
June 3, 2019 11:50 DTW 56.18 ft BTOC, difficult flow, 13:51 DTW is 102.73 ft BTOC. Pulled pump, intake caked with bentonite.
Discussed situation with Dan Griffiths (tech lead), he stated that due to the drawdown observed we were pulling water from the formation and had evacuated the casing and well can be considered fully developed despite not reaching three-well volumes as designated in the work plan.
*Development spanned multiple days, causing times and duration to be calculated incorrectly

WELL DEVELOPMENT LOG

Geologist Signature:	

WELL DEVELOPMENT LOG

Well ID:	V4-MW-5		
Date:	06/04/2019	Field Personnel:	Dan Chamberland, Kylah Wyatt
Site Name:	Burlington	Contractor:	Parsons
AOC:	2	Evacuation Method	submersible pump
Project No.:	30001		

Weather

Temperature °F	Precipitation	Wind Speed mph	Wind Direciton	Sky
59	None	5	N	Sunny

Depth to Bottom (Initial):	46.75 ft.	Date(s) Installed:	Driller:	N/A	
Depth to Bottom (Final):	46.81 ft.	Unknown - Existing Well	Well Diameter:	2	in.
Depth to Water (Initial)	28.87 ft.	Date(s) Developed:			
Depth to Water (Final):	28.9 ft.	06/04/2019	Development Times		
Measuring Point:	Top of Casing		Start	06:48	
Pump Setting (Intake):	42		Stop:	07:28	
Water Column Volume:	2.91		Total:	37.9 min.	

Well Volumes	Volume Removed Gallons	Temp. °C	pH s.u.	Conductivity mS/cm	Turbidity NTU	Approximate Flow Rate gal/min	DTW ft.	Appearance of Water Color	Odor
Start	0	-	-	-	-	-	-	-	-
1	1.9	13.4	7.52	0.79	518	0.5	32.8	grey	none
2	3.8	13.6	7.72	0.87	142	0.5	29.1	grey	none
3	5.7	13.4	7.69	0.86	29.4	0.5	29.15	grey	none

Total volume of Development water removed: (gallons) 5.7

Development Water Characteristics:

Physical Appearance at start		Physical Appearance at end	
Color:	-	Color:	grey
Odor:	-	Odor:	none
Sheen/Free Product:	-	Sheen/Free Product:	No

Notes:
1 WV: 2.98 GAL. 3WV IS 9 GAL
Pump issues caused 10 min down time

Geologist Signature: 

WELL DEVELOPMENT LOG

Well ID:	V4-MW413		
Date:	06/01/2019	Field Personnel:	Kylah Wyatt
Site Name:	Burlington	Contractor:	Parsons
AOC:	4	Evacuation Method	submersible pump
Project No.:	30001		

Weather

Temperature °F	Precipitation	Wind Speed mph	Wind Direciton	Sky
63	None	5	NE	Partly Cloudy

Depth to Bottom (Initial):	41.56 ft.	Date(s) Installed:	Driller:	N/A	
Depth to Bottom (Final):	41.57 ft.	Unknown - Existing Well	Well Diameter:	2	in.
Depth to Water (Initial)	17.22 ft.	Date(s) Developed:			
Depth to Water (Final):	17.23 ft.	06/01/2019	Development Times		
Measuring Point:	Top of Casing		Start:	10:52	
Pump Setting (Intake):	-		Stop:	11:29	
Water Column Volume:	3.97		Total:	36.3 min.	

Well Volumes	Volume Removed Gallons	Temp. °C	pH s.u.	Conductivity mS/cm	Turbidity NTU	Approximate Flow Rate gal/min	DTW ft.	Appearance of Water Color	Odor
Start	0	-	-	-	-	-	-	-	-
1	4	11.4	7.85	0.62	1E+08	0.5	-	grey	none
2	8	11.2	7.85	0.38	999999	0.5	-	grey	none
3	12	11.3	7.92	0.59	337	0.5	-	grey	-

Total volume of Development water removed: (gallons) 12

Development Water Characteristics:

Physical Appearance at start		Physical Appearance at end	
Color:	-	Color:	grey
Odor:	-	Odor:	-
Sheen/Free Product:	-	Sheen/Free Product:	-

Notes: 1WV : 4// 3WV : 12

Geologist Signature:



WELL DEVELOPMENT LOG

Well ID:	V4-MW414		
Date:	06/01/2019	Field Personnel:	Aaron Sutton, Kylah Wyatt
Site Name:	Burlington	Contractor:	Parsons
AOC:	4	Evacuation Method	submersible pump
Project No.:	30001		

Weather

Temperature °F	Precipitation	Wind Speed mph	Wind Direciton	Sky
61	None	6	NE	Mostly Cloudy

Depth to Bottom (Initial):	70.5 ft.	Date(s) Installed:		Driller:	N/A
Depth to Bottom (Final):	69.31 ft.	Unknown - Existing Well		Well Diameter:	2 in.
Depth to Water (Initial)	42.79 ft.	Date(s) Developed:			
Depth to Water (Final):	62.62 ft.	06/01/2019		Development Times	
Measuring Point:	Top of Casing			Start:	09:17
Pump Setting (Intake):	-			Stop:	09:54
Water Column Volume:	4.52			Total:	38.9 min.

Well Volumes	Volume Removed Gallons	Temp. °C	pH s.u.	Conductivity mS/cm	Turbidity NTU	Approximate Flow Rate gal/min	DTW ft.	Appearance of Water Color	Odor
Start	0	-	-	-	-	-	-	-	-
1	4.3	11.6	8.3	0.16	151	0.5	-	grey	none
2	9.1	11.5	8.31	0.18	99999	-	-	grey	none
3	14.5	11.8	8.39	0.18	422	0.75	62.62	grey	none

Total volume of Development water removed: (gallons) 14.5

Development Water Characteristics:

Physical Appearance at start		Physical Appearance at end	
Color:	-	Color:	grey
Odor:	-	Odor:	none
Sheen/Free Product:	-	Sheen/Free Product:	No

Notes: 1 wv: 4.57. // 3wv: 13.71

Not sure how the initial reading for TD was missed order, likely was 68.5 ft btoc

Geologist Signature:



APPENDIX F Groundwater Sampling Logs

Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN		AOC:	6	Date:	071/01/2019		
Well ID:	AASF06-MW01S		Samplers:	Kylah Wyatt							
Purge Start Date:	7/1/2019		Time:	11:20	Purge End Date:		7/1/2019	Time:	11:20		
Weather:	Wind:	5 mph, N	Precipitation:	None		Sky:	Sunny		Temperature °F:	90	
Well Labeled:	Yes		Well Secured:	Yes		Comments:	-				
PID SN:	-			Well Headspace (PID mu):			-		Odor:	none	
Water Level Instrument:		Solinst					Serial No.:		251927		
SWL beginning (BTOC):		14.31		WL After pump install (BTOC):			14.31		Max Drawdown (in.):	0	
Well Casing (inches):		2			Borehole diameter:		6		Sandpack length (ft.):	11	
Screen Length:	5 - 15				Parameters Measured With:				YSI 18h100703		
Water Column height (ft.):		0.69	Total Purge Volume (gallons):			0.099			Purge Method:	Low Flow	
Max Purge Rate mL/min.:			50		Sampling Flow Rate mL/min:				50		
Pump Type:	peristaltic		Pump Vol.:		0			Tubing Material:		HDPE	
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	14.81		Total Pump + Tubing + Flow Cell Vol.:			0.0502	
Well Casing Vol. (gallons):		2.45		Sandpack Vol. (gal.):	0.27		Total Well Volume (gal.):			2.72	
Depth of pump inlet (BTOC):		14.8		Rationale:			Just up from bottom due to very low water level				

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
11:20	0	0	-	-	-	-	-	-	-	-	Direct sample. Only able to collect 375 mL, no parameters.

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
11:20	0	-	-	-	-	-	-	-	-	-	0

Sample Type:	MW	Sample Number:	AASF06-MW01S-01	Sample Equipment:	peristaltic and HDPE
Duplicate:	-			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:		Date:	-	By:	-
Discharge Water Dispostion:	-				
Comments:	-			Drum No.:	-
Prepared by:	Kylah Wyatt				
Date Prepared:	01-Jul-2019				



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN		AOC:	6	Date:	07/15/2019		
Well ID:	AASF06-MW01S		Samplers:	Aaron Sutton, Jessica click							
Purge Start Date:	07/17/2019		Time:	13:52	Purge End Date:		07/17/2019	Time:	10:24		
Weather:	Wind:	3 mph, N	Precipitation:	None		Sky:	Sunny	Temperature °F:	80		
Well Labeled:	Yes		Well Secured:	Yes		Comments:	-				
PID SN:	110-014589			Well Headspace (PID mu):		0		Odor:	none		
Water Level Instrument:	Solinst					Serial No.:	306670				
SWL beginning (BTOC):	14.32			WL After pump install (BTOC):		14.32		Max Drawdown (in.):	4.2		
Well Casing (inches):	2			Borehole diameter:		6		Sandpack length (ft.):	11		
Screen Length:	5 - 15			Parameters Measured With:		YSI 14k100940					
Water Column height (ft.):	0.68		Total Purge Volume (gallons):		0		Purge Method:	Low Flow			
Max Purge Rate mL/min.:			50	Sampling Flow Rate mL/min:		50					
Pump Type:	peristaltic		Pump Vol.:	0			Tubing Material:	HDPE			
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	15	Total Pump + Tubing + Flow Cell Vol.:		0.0502			
Well Casing Vol. (gallons):	2.45			Sandpack Vol. (gal.):	0.266	Total Well Volume (gal.):		2.716			
Depth of pump inlet (BTOC):	14.5			Rationale:		Hardly any water in well, have to set intake at bottom of well					

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
13:52	0	0	-	-	-	-	-	-	-	-	Pump on.
13:53	1	0	14.54	16.5	8.37	1.24	59	0.498	-	241	
13:56	3	0	14.67	14.3	8.76	1.11	-80.9	0.421	-	384	Purged well dry. Will revisit tomorrow.

Low-Flow Groundwater Purge And Sample Log

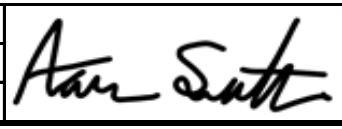
10:24	-212	0	14.54	-	-	-	-	-	-	-	Pump on. Collecting sample first. Filled one bottle 3/4 full. Well is completely dry. No parameters taken.

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
10:24	-212	0	14.54	-	-	-	-	-	-	-	0

Sample Type:	MW	Sample Number:	AASF06-MW01S-02	Sample Equipment:	peristaltic and HDPE
Duplicate:	-			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:		Date:	-	By:	-
Discharge Water Dispostion:	dumped on				
Comments:	-			Drum No.:	-
Prepared by:	Aaron Sutton				
Date Prepared:	17-Jul-2019				



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN		AOC:	6	Date:	06/24/2019		
Well ID:	AASF06-MW02S		Samplers:	Dan Chamberland							
Purge Start Date:	06/24/2019		Time:	08:20	Purge End Date:		06/25/2019	Time:	10:00		
Weather:	Wind:	5 mph, E	Precipitation:	None		Sky:	Sunny		Temperature °F:	70	
Well Labeled:	No		Well Secured:	Yes		Comments:	-				
PID SN:	592-919025			Well Headspace (PID mu):			0		Odor:	none	
Water Level Instrument:	Solinst						Serial No.:		3010-1123		
SWL beginning (BTOC):	12.03			WL After pump install (BTOC):			12.03		Max Drawdown (in.):	33.48	
Well Casing (inches):	2				Borehole diameter:		4		Sandpack length (ft.):	14	
Screen Length:	6 - 16				Parameters Measured With:				YSI		
Water Column height (ft.):	3.97		Total Purge Volume (gallons):			0.8			Purge Method:	Low Flow	
Max Purge Rate mL/min.:			150		Sampling Flow Rate mL/min:				80		
Pump Type:	peristaltic		Pump Vol.:		0			Tubing Material:		HDPE	
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	15		Total Pump + Tubing + Flow Cell Vol.:			0.0502	
Well Casing Vol. (gallons):	2.61			Sandpack Vol. (gal.):		0.58		Total Well Volume (gal.):		3.19	
Depth of pump inlet (BTOC):	12.2			Rationale:			Avoiding sediment on the bottom while still being in the water.				

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
08:20	0	0	12.03	8.3	6.75	3.73	192.6	1.01	-	268	-
08:25	5	0.2	13	8.4	7.04	4.13	207.8	1.05	-	9999	-
08:30	5	0.2	13.27	8.3	7.2	3.4	186.5	1.06	-	9999	-
08:35	5	0.1	13.65	8.8	7.55	2.93	-161.3	1.07	-	9999	-
08:40	5	0.1	13.88	8.3	7.59	2.62	157	1.06	-	9999	-
08:45	5	0.1	14.36	8.6	7.67	1.62	133.4	160.1	-	9999	-
08:50	5	0.1	14.82	8.7	59.61		105.7	0.99	-	9999	Water is silty Gray
08:55	5	0							-		Well purged dry at 14.90

Low-Flow Groundwater Purge And Sample Log

10:00	65		12.08	10.4	8.31	9.81	50	1.02	-	283	06/25 after being purged dry the previous day.

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
10:00	65	0.8	12.08	10.4	8.31	9.81	50	1.02	-	283	0

Sample Type:	MW	Sample Number:	AASF06-MW02S-01	Sample Equipment:	peristaltic and HDPE
Duplicate:	-			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:		Date:	-	By:	-
Discharge Water Dispostion:	-				
Comments:	No decon required. Dedicated tubing and peristaltic pump.			Drum No.:	-
Prepared by:	Dan Chamberland				
Date Prepared:	26-Jun-2019				



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN		AOC:	6	Date:	07/15/2019		
Well ID:	AASF06-MW02S		Samplers:	Aaron Sutton, Jessica click							
Purge Start Date:	07/15/2019		Time:	12:23	Purge End Date:		07/15/2019	Time:	09:53		
Weather:	Wind:	2 mph, N	Precipitation:	None		Sky:	Sunny		Temperature °F:	80	
Well Labeled:	Yes		Well Secured:	Yes		Comments:	-				
PID SN:	110-104589			Well Headspace (PID mu):			0		Odor:	none	
Water Level Instrument:		Solinst					Serial No.:		306670		
SWL beginning (BTOC):		12.06		WL After pump install (BTOC):			12.06		Max Drawdown (in.):	30.6	
Well Casing (inches):		2			Borehole diameter:		6		Sandpack length (ft.):	12	
Screen Length:	6 - 16				Parameters Measured With:				YSI 14k100940		
Water Column height (ft.):		3.94		Total Purge Volume (gallons):			2.3		Purge Method:	Low Flow	
Max Purge Rate mL/min.:				125			Sampling Flow Rate mL/min:		100		
Pump Type:	peristaltic			Pump Vol.:	0				Tubing Material:	HDPE	
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	14		Total Pump + Tubing + Flow Cell Vol.:			0.0502	
Well Casing Vol. (gallons):		2.61		Sandpack Vol. (gal.):	1.54		Total Well Volume (gal.):			4.15	
Depth of pump inlet (BTOC):		14		Rationale:			Middle of water column				

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
12:23	0	0	-	-	-	-	-	-	-	-	Pump on
12:25	2	0.1	12.28	14.3	7.31	2.54	68.6	1.49	-	191	No TDS
12:28	3	0.1	12.39	14.2	7.38	1.66	-1	1.48	-	132	-
12:31	3	0.1	12.53	14.2	7.44	1.41	-55.5	1.48	-	114	No TDS
12:34	3	0.1	12.7	14.1	7.46	1.21	-66.8	1.49	-	103	No TDS
12:37	3	0.1	12.79	14.04	7.46	0.97	-65.4	1.51	-	79.2	No TDS
12:40	3	0.1	12.94	13.9	7.48	0.89	-66.1	1.51	-	83.3	No TDS
12:43	3	0.1	13.1	13.9	7.49	0.82	-66.4	1.51	-	95.9	No TDS
12:46	3	0.1	13.16	14	7.5	0.77	-66	1.51	-	110	No TDS
12:49	3	0.1	13.33	14.1	7.52	0.73	-65	1.52	-	121	No TDS
12:52	3	0.1	13.46	14.1	7.53	0.7	-63.8	1.52	-	125	No TDS
12:55	3	0.1	13.62	14.2	7.55	0.65	-63.3	1.51	-	135	No TDS
12:58	3	0.1	13.74	14.1	7.57	0.62	-62.9	1.49	-	145	No TDS
13:01	3	0.1	13.88	14.1	7.6	0.59	-65.1	1.48	-	229	No TDS

Low-Flow Groundwater Purge And Sample Log

13:04	3	0.1	14.04	14	7.61	0.57	-69.2	1.47	-	268	No TDS
13:07	3	0.1	14.23	14.1	7.63	0.55	-72.9	1.47	-	423	No TDS
13:10	3	0.1	14.36	14.2	7.66	0.51	-82.9	1.46	-	531	No TDS
13:13	3	0.1	14.54	14.1	7.7	0.48	-117.2	1.42	-	9999999	No TDS
13:16	3	0.1	14.61	15.3	7.7	1.48	-124.9	1.44	-	9999999	No TDS
09:37	-	0	12.17	-	-	-	-	-	-	-	Initial dtw. Pump on at 0937. Collected sample first then began parameter readings on 7-15-19.
09:47	10	0.3	12.72	15.3	6.88	4.24	167.3	1.33	-	99	-
09:50	3	0.1	12.84	14.6	7.15	3.11	171.3	1.29	-	85	-
09:53	3	0.1	12.98	14.7	7.18	2.1	173.1	1.3	-	103	Collected three readings. Pump off.

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
09:37	-	0	12.17	-	-	-	-	-	-	-	-

Sample Type:	MW	Sample Number:	AASF06-MW02S-02	Sample Equipment:	peristaltic and HDPE		
Duplicate:	-			MS/MSD:	-		
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-		
Sample Equipment Decon:		Date:	-	By:	-	Discharge Water Dispostion:	dumped on
Comments:	-					Drum No.:	-
Prepared by:	Aaron Sutton						
Date Prepared:	16-Jul-2019						

Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN	AOC:	6	Date:	06/16/2019			
Well ID:	AASF06-MW03S		Samplers:	Dan Chamberland, Aaron Sutton							
Purge Start Date:	06/16/2019		Time:	10:10	Purge End Date:	06/16/2019	Time:	11:35			
Weather:	Wind:	5 mph, W	Precipitation:	None	Sky:	Mostly Cloudy	Temperature °F:	65			
Well Labeled:	No		Well Secured:	Yes	Comments:	-					
PID SN:	110-014589		Well Headspace (PID mu):		0.1		Odor:	none			
Water Level Instrument:	Heron				Serial No.:	3010-1078					
SWL beginning (BTOC):	7.25		WL After pump install (BTOC):		7.25		Max Drawdown (in.):	14.16			
Well Casing (inches):	2		Borehole diameter:		6		Sandpack length (ft.):	12			
Screen Length:	5.66 - 15.66		Parameters Measured With:		YSI 12100493						
Water Column height (ft.):	8.41		Total Purge Volume (gallons):		2.5		Purge Method:	Low Flow			
Max Purge Rate mL/min.:	150		Sampling Flow Rate mL/min:		150						
Pump Type:	peristaltic		Pump Vol.:	0	Tubing Material:	HDPE					
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	28	Total Pump + Tubing + Flow Cell Vol.:		0.0505			
Well Casing Vol. (gallons):	2.55		Sandpack Vol. (gal.):		3.43	Total Well Volume (gal.):		5.98			
Depth of pump inlet (BTOC):	10		Rationale:		Middle of screen						

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
10:10	0	0	7.25	10.4	7.12	2.53	116.6	0.96	-	7.39	-
10:15	5	0.19813	7.62	7.6	7.02	1.64	103.6	0.86	-	13.3	No TDS
10:20	5	0.19813	7.79	7.7	7.07	1.56	87.6	0.86	-	33.5	-
10:25	5	0.19813	1.9	7.5	7.12	1.51	79.6	0.85	-	28.5	No TDS
10:30	5	0.19813	8.04	7.8	7.12	1.52	74.8	0.86	-	31.1	No TDS
10:35	5	0.19813	8.25	8.1	7.19	1.52	67.7	0.87	-	30.1	No TDS
10:40	5	0.132086	8.28	8.4	7.27	1.37	61.7	0.88	-	22.5	No TDS
10:45	5	0.165108	8.33	8.4	7.31	1.35	56.9	0.87	-	21.7	No TDS
10:50	5	0.132086	8.35	8.3	7.31	1.24	55.3	0.87	-	16.1	No TDS
10:55	5	0.132086	8.38	8.3	7.3	1.23	52.9	0.88	-	15.7	No TDS
11:00	5	0.132086	8.41	8.6	7.3	1.25	50.3	0.89	-	14.8	No TDS
11:05	5	0.132086	8.44	8.4	7.34	1.24	46.1	0.89	-	12.7	No TDS
11:10	5	0.112273	8.43	8.8	7.33	1.25	45.7	0.89	-	9.67	No TDS

Low-Flow Groundwater Purge And Sample Log

11:15	5	0.118878	8.4	9.3	7.35	1.32	42.6	0.91	-	8.98	No TDS
11:20	5	0.118878	8.41	8.8	7.39	1.26	39.9	0.9	-	7.93	No TDS
11:25	5	0.125482	8.42	9.3	7.34	1.39	40.4	0.91	-	5.59	No TDS
11:30	5	0.118878	8.425	9.2	7.38	1.27	37.9	0.92	-	5.91	No TDS
11:35	5	0.125482	8.43	8.8	7.37	1.27	39.1	0.91	-	6.04	No TDS

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
11:35	5	2.536059	8.43	8.8	7.37	1.27	39.1	0.91	-	6.04	0

Sample Type:		Sample Number:	AASF06-MW03S-01	Sample Equipment:	peristaltic and HDPE
Duplicate:	-			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:	Date:	16-Jun-2019	By: Dan Chamberland	Discharge Water Dispostion:	-
Comments:	Purge water placed in tote.			Drum No.:	-
Prepared by:	Dan Chamberland				
Date Prepared:	16-Jun-2019				

Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN		AOC:	6	Date:	07/12/2019		
Well ID:	AASF06-MW03S		Samplers:	Dan Chamberland							
Purge Start Date:	07/12/2019		Time:	16:20	Purge End Date:		07/12/2019	Time:	17:41		
Weather:	Wind:	10 mph, SE	Precipitation:	Rain		Sky:	Overcast	Temperature °F:	79		
Well Labeled:	Yes		Well Secured:	Yes		Comments:	-				
PID SN:	110-014589				Well Headspace (PID mu):		0	Odor:	none		
Water Level Instrument:		Solinst					Serial No.:	3010-1133			
SWL beginning (BTOC):		7.26			WL After pump install (BTOC):		6.77	Max Drawdown (in.):	12		
Well Casing (inches):		2			Borehole diameter:		6	Sandpack length (ft.):	12		
Screen Length:	6 - 16				Parameters Measured With:		YSI				
Water Column height (ft.):		9.23	Total Purge Volume (gallons):			3.5	Purge Method:		low-flow		
Max Purge Rate mL/min.:			200		Sampling Flow Rate mL/min:		135				
Pump Type:	peristaltic		Pump Vol.:		0		Tubing Material:	HDPE			
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	20	Total Pump + Tubing + Flow Cell Vol.:			0.0503		
Well Casing Vol. (gallons):		2.61		Sandpack Vol. (gal.):		3.62	Total Well Volume (gal.):		6.23		
Depth of pump inlet (BTOC):		11		Rationale:		Middle of screen					

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
16:20	0	0	6.77	12.2	6.77	3.62	110.2	1.92	-	9999	-
16:25	5	0.3	7.51	12.2	7.23	8.14	110.1	1.92	-	9999	-
16:30	5	0.3	7.58	12.2	7.28	7.11	108.8	1.92	-	9999	-
16:35	5	0.3	7.65	12	7.3	6.65	108.8	1.91	-	9999	-
16:40	5	0.2	7.71	12.4	7.33	5.6	109.2	1.92	-	9999	-
16:45	5	0.2	7.71	12.5	7.34	5.1	109.4	1.93	-	9999	-
16:50	5	0.2	7.72	12.5	7.36	4.76	109.4	1.92	-	9999	-
16:55	5	0.2	7.74	12.6	7.37	4.62	108.9	1.92	-	9999	-
17:00	5	0.2	7.76	12.8	7.37	4.62	108.1	1.93	-	325	-
17:05	5	0.2	7.75	12.8	7.39	4.61	107.6	1.93	-	247	-
17:10	5	0.2	7.76	12.9	7.39	4.82	106.8	1.95	-	149	-
17:15	5	0.2	7.76	12.9	7.41	4.97	106.3	1.96	-	95.7	-
17:20	5	0.2	7.77	12.9	7.41	4.81	105.5	1.97	-	72.6	-

Low-Flow Groundwater Purge And Sample Log

17:25	5	0.2	7.76	12.9	7.42	4.71	104.4	1.96	-	57.5	-
17:30	5	0.2	7.76	12.9	7.42	4.35	103.6	1.95	-	51.5	-
17:35	5	0.2	7.76	12.8	7.43	4.34	102.9	1.93	-	48.5	-
17:40	5	0.2	7.76	12.7	7.43	4.37	101.8	1.93	-	47.8	-
17:41	1	0	7.76	12.7	7.43	4.37	101.7	1.92	-	45.6	-

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
17:41	1	0	7.76	12.7	7.43	4.37	101.7	1.92	-	45.6	0

Sample Type:	MW	Sample Number:	AASF06-MW03S-02	Sample Equipment:	-
Duplicate:	-			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:	Date:	-	By:	-	Discharge Water Dispostion: dumped on
Comments:	-			Drum No.:	-
Prepared by:	Dan Chamberland				
Date Prepared:	12-Jul-2019				



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN		AOC:	2	Date:	06/19/2019		
Well ID:	BRLTN02-MW01D		Samplers:	Aaron Sutton							
Purge Start Date:	06/19/2019		Time:	10:40	Purge End Date:	06/19/2019		Time:	11:25		
Weather:	Wind:	4 mph, N	Precipitation:	None		Sky:	Sunny		Temperature °F:	70	
Well Labeled:	No		Well Secured:	Yes		Comments:	-				
PID SN:	-			Well Headspace (PID mu):		-			Odor:	none	
Water Level Instrument:	Solinst					Serial No.:	251927				
SWL beginning (BTOC):	23.73			WL After pump install (BTOC):		23.73			Max Drawdown (in.):	7.6	
Well Casing (inches):	2				Borehole diameter:	6			Sandpack length (ft.):	17	
Screen Length:	55 - 60				Parameters Measured With:		YSI 14K100940				
Water Column height (ft.):	36.27		Total Purge Volume (gallons):		2.7		Purge Method:		Low Flow		
Max Purge Rate mL/min.:			225		Sampling Flow Rate mL/min:		225				
Pump Type:	peristaltic		Pump Vol.:		0		Tubing Material:		HDPE		
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	64	Total Pump + Tubing + Flow Cell Vol.:			0.051		
Well Casing Vol. (gallons):	9.79			Sandpack Vol. (gal.):	2.74	Total Well Volume (gal.):			12.53		
Depth of pump inlet (BTOC):	57.5			Rationale:		Middle of screen					

PURGE CYCLE

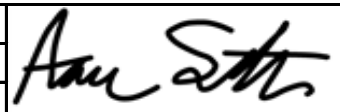
Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
10:40	0	0	24.46	14.8	9.04	3.84	121.5	0.229	-	89.3	No TDS
10:45	5	0.3	24.92	14.3	8.66	1.78	-76.1	0.219	-	59.7	No TDS
10:50	5	0.3	25.02	14.7	8.65	1.35	-140.1	0.218	-	44	No TDS
10:55	5	0.3	25.03	14.6	8.7	1.09	-185.9	0.217	-	36.8	No TDS
11:00	5	0.3	25.06	14.6	8.65	0.86	-234.2	0.219	-	31.5	No TDS
11:05	5	0.3	25.08	14.2	8.6	0.65	-282.4	0.214	-	28.3	No TDS
11:10	5	0.3	25.07	14.5	8.66	0.54	-309.3	0.216	-	19.6	No TDS
11:15	5	0.3	25.08	14.7	8.64	0.46	-333.2	0.216	-	17	No TDS
11:20	5	0.3	25.08	14.7	8.68	0.5	-332.5	0.216	-	17.1	No TDS
11:25	5	0.3	25.09	14.6	8.68	0.48	-331.3	0.215	-	17	No TDS

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
11:25	5	2.7	25.09	14.6	8.68	0.48	-331.3	0.215	-	17	0

Sample Type:	MW	Sample Number:	BRLTN02-MW01D-01	Sample Equipment:	peristaltic and HDPE
Duplicate:	BRLTN02-MW01D-91			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:		Date:	-	By:	-
Discharge Water Dispostion:	55-gallon				
Comments:	-			Drum No.:	-
Prepared by:	Aaron Sutton				
Date Prepared:	19-Jun-2019				



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN		AOC:	2	Date:	07/10/2019		
Well ID:	BRLTN02-MW01D		Samplers:	Kylah Wyatt							
Purge Start Date:	07/10/2019		Time:	10:22	Purge End Date:	07/10/2019		Time:	11:02		
Weather:	Wind:	5 mph, N	Precipitation:	None		Sky:	Sunny		Temperature °F:	75	
Well Labeled:	Yes		Well Secured:	Yes		Comments:	-				
PID SN:	110-014589			Well Headspace (PID mu):		0			Odor:	none	
Water Level Instrument:	Solinst					Serial No.:	16820				
SWL beginning (BTOC):	23.63			WL After pump install (BTOC):		23.63			Max Drawdown (in.):	13.44	
Well Casing (inches):	2			Borehole diameter:		6			Sandpack length (ft.):	7	
Screen Length:	55.1 - 60.1			Parameters Measured With:		YSI 14h100036					
Water Column height (ft.):	36.47		Total Purge Volume (gallons):		2.5			Purge Method:		Low Flow	
Max Purge Rate mL/min.:			208	Sampling Flow Rate mL/min:		150					
Pump Type:	peristaltic		Pump Vol.:	0				Tubing Material:	HDPE		
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	70	Total Pump + Tubing + Flow Cell Vol.:			0.051		
Well Casing Vol. (gallons):	9.8			Sandpack Vol. (gal.):	2.39	Total Well Volume (gal.):			12.19		
Depth of pump inlet (BTOC):	58			Rationale:		5 ft screen. Midscreen.					

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
10:22	0	0	-	-	-	-	-	-	-	-	Pump on
10:26	4	0.2	24.56	14.3	8.16	0.85	114.2	0.177	-	32.8	-
10:29	3	0.2	24.64	14.6	8.16	0.51	111.7	0.179	-	31.3	-
10:32	3	0.2	24.68	14.6	8.17	0.56	110.7	0.179	-	28.7	-
10:35	3	0.2	24.71	14.8	8.1	0.33	106	0.179	-	20	-
10:38	3	0.2	24.71	14.7	8.12	0.3	101.7	0.179	-	16.4	-
10:41	3	0.2	24.72	14.9	8.13	0.33	98.7	0.18	-	9.33	-
10:45	4	0.2	24.72	15.2	8.11	0.24	93.5	0.183	-	9.37	-
10:48	3	0.2	24.72	15.3	8.07	0.45	88.4	0.183	-	8.32	-
10:51	3	0.2	24.74	15.3	8.11	0.46	86.3	0.183	-	4.75	-
10:56	5	0.3	24.73	15.3	8.13	0.32	82	0.182	-	3.63	-
10:59	3	0.2	24.74	15.1	8.12	0.26	78.2	0.182	-	3	-
11:02	3	0.2	24.75	15	8.12	0.24	76.6	0.181	-	2.82	Turbidity +/-

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
11:02	3	2.5	24.75	15	8.12	0.24	76.6	0.181	0	2.82	0

Sample Type:	MW	Sample Number:	BRLTN02-MW01D-02	Sample Equipment:	peristaltic and HDPE
Duplicate:	-			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:		Date:	-	By:	-
Discharge Water Dispostion:	dumped on				
Comments:	Dedicated equipment			Drum No.:	-
Prepared by:	Kylah Wyatt				
Date Prepared:	10-Jul-2019				



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN		AOC:	2	Date:	06/19/2019		
Well ID:	BRLTN02-MW01S		Samplers:	Aaron Sutton							
Purge Start Date:	06/19/2019		Time:	12:14	Purge End Date:	06/19/2019		Time:	13:19		
Weather:	Wind:	4 mph, E	Precipitation:	None		Sky:	Sunny		Temperature °F:	75	
Well Labeled:	No		Well Secured:	Yes		Comments:	-				
PID SN:	-			Well Headspace (PID mu):		-			Odor:	none	
Water Level Instrument:	Solinst					Serial No.:	251927				
SWL beginning (BTOC):	21.73			WL After pump install (BTOC):		21.73			Max Drawdown (in.):	0.1	
Well Casing (inches):	2				Borehole diameter:	6			Sandpack length (ft.):	12	
Screen Length:	25 - 35				Parameters Measured With:		YSI 14K100940				
Water Column height (ft.):	13.27		Total Purge Volume (gallons):		3.9		Purge Method:		Low Flow		
Max Purge Rate mL/min.:			250		Sampling Flow Rate mL/min:		250				
Pump Type:	peristaltic		Pump Vol.:		0		Tubing Material:		HDPE		
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	39	Total Pump + Tubing + Flow Cell Vol.:			0.0506		
Well Casing Vol. (gallons):	5.71			Sandpack Vol. (gal.):	4.7	Total Well Volume (gal.):			10.41		
Depth of pump inlet (BTOC):	32			Rationale:		Middle of screen					

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
12:14	0	0	21.85	14.5	7.13	7.14	128.1	0.381	-	185	No TDS
12:19	5	0.3	21.85	14.3	6.78	6.53	135.3	0.393	-	46.4	No TDS
12:24	5	0.3	21.86	13.9	6.8	6.02	139.3	0.384	-	30.3	No TDS
12:29	5	0.3	21.86	14	6.87	5.41	138	0.372	-	17.8	No TDS
12:34	5	0.3	21.86	13.6	6.9	5.06	140	0.367	-	11.9	No TDS
12:39	5	0.3	21.86	13.7	6.84	4.54	139.8	0.359	-	8.03	No TDS
12:44	5	0.3	21.86	13.6	6.91	4.02	128.6	0.356	-	5.54	No TDS
12:49	5	0.3	21.86	13.5	6.91	3.71	122.7	0.352	-	3.93	No TDS
12:54	5	0.3	21.86	13.6	6.9	3.22	114.9	0.349	-	3.13	No TDS
12:59	5	0.3	21.86	13.6	6.93	2.93	110	0.348	-	2.2	No TDS
13:04	5	0.3	21.86	13.9	6.97	2.63	103	0.344	-	2.14	No TDS
13:09	5	0.3	21.86	13.7	6.93	2.53	104	0.343	-	2.19	No TDS
13:14	5	0.3	21.86	13.4	6.9	2.47	103.6	0.336	-	1.79	No TDS
13:19	5	0.3	21.86	13.3	6.89	2.45	100.6	0.337	-	1.47	No TDS

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
13:19	5	3.9	21.86	13.3	6.89	2.45	100.6	0.337	-	1.47	0

Sample Type:	MW	Sample Number:	BRLTN02-MW01S-01	Sample Equipment:	peristaltic and HDPE
Duplicate:	-			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:		Date:	-	By:	-
Discharge Water Dispostion:	55-gallon				
Comments:	-			Drum No.:	-
Prepared by:	Aaron Sutton				
Date Prepared:	19-Jun-2019				



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN		AOC:	2	Date:	07/10/2019		
Well ID:	BRLTN02-MW01S		Samplers:	Kylah Wyatt							
Purge Start Date:	07/10/2019		Time:	09:12	Purge End Date:	07/10/2019		Time:	09:35		
Weather:	Wind:	5 mph, N	Precipitation:	None		Sky:	Sunny		Temperature °F:	75	
Well Labeled:	Yes		Well Secured:	Yes		Comments:	-				
PID SN:	110-014589			Well Headspace (PID mu):		0			Odor:	none	
Water Level Instrument:	Solinst					Serial No.:	16820				
SWL beginning (BTOC):	21.58			WL After pump install (BTOC):		21.58			Max Drawdown (in.):	1.56	
Well Casing (inches):	2			Borehole diameter:		6			Sandpack length (ft.):	12	
Screen Length:	25.05-35.05			Parameters Measured With:		YSI 14h100036					
Water Column height (ft.):	13.47		Total Purge Volume (gallons):	1.4				Purge Method:	Low Flow		
Max Purge Rate mL/min.:	220			Sampling Flow Rate mL/min:		220					
Pump Type:	peristaltic		Pump Vol.:	0				Tubing Material:	HDPE		
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	38	Total Pump + Tubing + Flow Cell Vol.:			0.0506		
Well Casing Vol. (gallons):	5.72			Sandpack Vol. (gal.):	4.72	Total Well Volume (gal.):			10.44		
Depth of pump inlet (BTOC):	30			Rationale:		10 ft screen. Midscreen.					

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
09:12	0	0	-	-	-	-	-	-	-	-	Pump on
09:21	9	0.5	21.71	13.2	6.58	10.14	144.3	0.271	-	5.91	-
09:24	3	0.2	21.7	13	6.72	10.07	140.1	0.275	-	4.72	-
09:27	3	0.2	21.71	13	6.66	9.86	139	0.272	-	3.07	-
09:30	3	0.2	21.72	13	6.68	10	138.5	0.266	-	3.25	-
09:35	5	0.3	21.71	13	6.67	10.19	137.7	0.265	-	2.87	Turbidity is stable at plus/minus 1 NTU

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
09:35	5	1.4	21.71	13	6.67	10.19	137.7	0.265	-	2.87	0

Sample Type:	MW	Sample Number:	BRLTN02-MW01S-02	Sample Equipment:	peristaltic and HDPE
Duplicate:	BRLTN02-MW01S-92			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:	Date:	-	By:	-	Discharge Water Dispostion: dumped on
Comments:	Dedicated equipment			Drum No.:	-
Prepared by:	Kylah Wyatt				
Date Prepared:	10-Jul-2019				



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN		AOC:	3	Date:	06/17/2019		
Well ID:	BRLTN03-MW01D		Samplers:	Aaron Sutton							
Purge Start Date:	06/18/2019		Time:	08:37	Purge End Date:		06/18/2019	Time:	11:19		
Weather:	Wind:	2 mph, SW	Precipitation:	None		Sky:	Sunny		Temperature °F:	60	
Well Labeled:	No		Well Secured:	Yes		Comments:	-				
PID SN:	-			Well Headspace (PID mu):			-		Odor:	none	
Water Level Instrument:	Solinst						Serial No.:	251927			
SWL beginning (BTOC):	61.29			WL After pump install (BTOC):			60.7		Max Drawdown (in.):	61.7	
Well Casing (inches):	2				Borehole diameter:		6		Sandpack length (ft.):	12	
Screen Length:	70.45 - 80.45				Parameters Measured With:			YSI 10D101384			
Water Column height (ft.):	19.16		Total Purge Volume (gallons):			9.4		Purge Method:		Low Flow	
Max Purge Rate mL/min.:			400		Sampling Flow Rate mL/min:			400			
Pump Type:	submersible		Pump Vol.:		0.01		Tubing Material:		HDPE		
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	81	Total Pump + Tubing + Flow Cell Vol.:			0.051		
Well Casing Vol. (gallons):	13.12			Sandpack Vol. (gal.):	4.88		Total Well Volume (gal.):		18		
Depth of pump inlet (BTOC):	77.95			Rationale:		Aimed for middle of screen					

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
08:37	0	0	63.39	8.2	7.57	0.76	78.2	0.152	-	9999999	No TDS
08:42	5	0.3	64.8	8.6	7	0.48	52.7	0.164	-	9999999	No TDS
08:47	5	0.3	65.28	8.8	7.4	0.39	-10	0.165	-	9999999	No TDS
08:52	5	0.3	65.78	9	7.72	0.36	-39.8	0.166	-	99999	No TDS
08:57	5	0.3	66.2	9.1	7.87	0.33	-54.7	0.165	-	9999999	No TDS
09:02	5	0.4	66.57	9.2	8.06	0.31	-70.4	0.167	-	999999	No TDS
09:07	5	0.2	66.79	9.7	7.98	0.27	-70.1	0.169	-	99999	No TDS
09:12	5	0.3	66.88	9.5	8.19	0.28	-86.4	0.168	-	99999999	No TDS
09:17	5	0.3	67.07	9.5	8.19	0.26	-90.9	0.167	-	818	No TDS
09:22	5	0.3	67.71	9.7	8.25	0.25	-97.2	0.167		643	No TDS
09:27	5	0.3	67.95	9.4	8.52	0.23	-110	0.164	-	475	No TDS
09:32	5	0.2	68.17	9.7	8.52	0.22	-109.6	0.163	-	393	No TDS
09:37	5	0.5	68.01	9.4	8.54	0.22	-111.5	0.16	-	313	No TDS

Low-Flow Groundwater Purge And Sample Log

09:42	5	0.2	68.2	9.8	8.46	0.21	-108.5	0.16	-	280	No TDS
09:47	5	0.3	67.74	9.8	8.73	0.19	-122.6	0.158	-	253	No TDS
09:51	4	0.2	67.8	9.6	8.68	0.2	-120.9	0.166	-	225	No TDS
09:57	6	0.2	68.26	10.2	8.53	0.19	-114.4	0.156	-	195	No TDS
10:02	5	0.4	67.85	9.8	8.77	0.19	-126.3	0.155	-	182	No TDS
10:07	5	0.3	67.9	10.1	8.68	0.19	-121.4	0.154	-	151	No TDS
10:12	5	0.3	67.77	10.1	8.64	0.16	-119.7	0.152	-	134	No TDS
10:17	5	0.3	67.89	9.8	8.61	0.16	-118.4	0.149	-	112	No TDS
10:22	5	0.3	67.75	9.9	8.61	0.18	-120	0.149	-	104	No TDS
10:25	3	0.2	67.78	9.9	8.65	0.17	-121.4	0.148	-	96.7	No TDS
10:30	5	0.3	67.72	9.6	8.64	0.16	-120.7	0.147	-	77.2	No TDS
10:35	5	0.3	67.92	9.6	8.52	0.16	-115.2	0.146	-	71.1	No TDS
10:40	5	0.2	68.03	10.2	8.45	0.16	-112	0.147	-	63	No TDS
10:45	5	0.3	67.98	10.2	8.68	0.15	-124.2	0.147	-	57.1	No TDS
10:50	5	0.3	68.4	9.8	8.67	0.15	-123.5	0.145	-	53.1	No TDS
10:55	5	0.3	68.39	10.3	8.58	0.14	-119.8	0.147		46.4	No TDS
11:00	5	0.2	68.39	10.6	8.64	0.14	-122.8	0.147	-	39.7	No TDS
11:05	5	0.4	68.18	10.4	8.66	0.14	-124.6	0.145	-	41.1	No TDS
11:10	5	0.3	68.5	10.2	8.58	0.14	-122.2	0.145	-	35.6	No TDS
11:13	3	0.2	68.53	10.3	8.6	0.14	-123.6	0.146	-	32.1	No TDS
11:16	3	0.2	68.48	10.4	8.64	0.12	-125.8	0.146	-	30.2	No TDS
11:19	3	0	68.45	10.4	8.66	0.14	-127	0.146	-	29.2	No TDS

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
11:19	3	9.4	68.45	10.4	8.66	0.14	-127	0.146	-	29.2	0

Sample Type:	MW	Sample Number:	BRLTN03-MW01D-01	Sample Equipment:	submersible and HDPE
Duplicate:	-			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	BRLTN-061719-EB
Sample Equipment Decon:		Date:	18-Jun-2019	By:	Aaron Sutton
Discharge Water Dispostion:	55-gallon				
Comments:	Water extremely turbid. Conducted longer purge to get turbidity to stabilize			Drum No.:	-
Prepared by:	Aaron Sutton				
Date Prepared:	18-Jun-2019				



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN	AOC:	3	Date:	07/12/2019			
Well ID:	BRLTN03-MW01D		Samplers:	Dan Chamberland							
Purge Start Date:	07/12/2019		Time:	11:15	Purge End Date:	07/12/2019	Time:	13:46			
Weather:	Wind:	10 mph, SE	Precipitation:	None	Sky:	Sunny	Temperature °F:	79			
Well Labeled:	Yes		Well Secured:	Yes	Comments:	In front of fire hall.					
PID SN:	110-014589		Well Headspace (PID mu):		0		Odor:	none			
Water Level Instrument:	Heron				Serial No.:	3010-1133					
SWL beginning (BTOC):	61.45		WL After pump install (BTOC):		60.64		Max Drawdown (in.):	62.6			
Well Casing (inches):	2		Borehole diameter:		6		Sandpack length (ft.):	12			
Screen Length:	69.3 - 79.3		Parameters Measured With:		YSI 17M100413						
Water Column height (ft.):	18.4		Total Purge Volume (gallons):		5.93		Purge Method:	Low Flow			
Max Purge Rate mL/min.:	200		Sampling Flow Rate mL/min:		200						
Pump Type:	submersible		Pump Vol.:	0.1	Tubing Material:	HDPE					
Flow Cell Vol.:	0.02	Vol./ft.: 0.01	Total ft.:	83	Total Pump + Tubing + Flow Cell Vol.:		0.95				
Well Casing Vol. (gallons):	12.94		Sandpack Vol. (gal.):	4.7	Total Well Volume (gal.):		17.64				
Depth of pump inlet (BTOC):	74.3		Rationale:	In middle of screen							

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
11:15	0	0	60.64	21.9	10.16	2.36	59.92	0.326	-	257	-
11:20	5	0.3	63.72	16.8	8.61	0.46	60.4	0.24	-	9999	-
11:25	5	0.3	64.23	18.5	8.04	0.35	17.5	0.249	-	9999	-
11:30	5	0.2	64.37	17.8	8.14	0.32	-8.7	0.246	-	9999	-
11:35	5	0.2	64.42	18.4	8.19	0.31	-44.1	0.247	-	9999	-
11:40	5	0.2	64.49	19	8.23	0.3	-58.7	0.25	-	9999	-
11:45	5	0.2	64.59	17.6	8.27	0.29	-82.4	0.243	-	9999	-
11:50	5	0.2	64.69	17.1	8.32	0.28	-92.7	0.238	-	9999	-
11:55	5	0.2	64.75	19.3	8.34	0.26	-102.2	0.244	-	9999	-
12:00	5	0.2	64.68	19.2	8.43	0.27	-106	0.243	-	9999	-
12:05	5	0.2	64.64	19.8	8.54	0.25	-108.7	0.242	-	9999	-
12:10	5	0.2	64.65	19.7	8.66	0.28	-105.1	0.237	-	9999	-
12:15	5	0.2	64.8	16.9	8.76	0.22	-104.1	0.214	-	9999	-

Low-Flow Groundwater Purge And Sample Log

12:20	5	0.2	64.81	17.5	8.81	0.23	-105.2	0.214	-	9999	-
12:25	5	0.2	64.83	17.2	9.01	0.21	-109.8	0.213	-	9999	-
12:30	5	0.2	65.86	17.2	9.05	0.22	-108.8	0.216	-	586	-
12:35	5	0.1	64.85	17.5	9.08	0.21	-107.8	0.219	-	332	-
12:40	5	0.2	64.87	17.3	9.06	0.2	-99.4	0.196	-	236	-
12:45	5	0.2	64.89	17.5	9.22	0.21	-105.9	0.208	-	172	-
12:50	5	0.2	64.91	17.5	9.23	0.2	-103.1	0.207	-	143	-
12:55	5	0.2	64.92	17.5	9.21	0.19	-101.3	0.206	-	121	-
13:00	5	0.2	64.94	17.6	9.18	0.19	-98.1	0.206	-	102	-
13:05	5	0.2	64.93	17.2	9.15	0.19	-96.1	0.19	-	98.4	-
13:10	5	0.2	64.96	17.3	9.14	0.18	-96.4	0.189	-	90.3	-
13:15	5	0.2	64.96	17.5	9.12	0.17	-91.6	0.178	-	98	-
13:20	5	0.2	65	16.8	8.88	0.11	-84.7	0.184	-	80.2	-
13:25	5	0.2	65	16.2	9.2	0.11	-98.9	0.187	-	49.9	-
13:30	5	0.2	65	16.6	9.24	0.11	-102.7	0.19	-	59.9	-
13:35	5	0.2	65.05	16.9	9.27	0.11	-105.8	0.191	-	59.4	-
13:40	5	0.2	65.08	16.8	9.19	0.1	-104.6	0.187	-	55.4	-
13:46	6	0.1	65.1	16.6	9.17	0.1	-103.9	0.186	-	54.3	-

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
13:46	6	0.1	65.1	16.6	9.17	0.1		0.186	-	54.3	0

Sample Type:	MW	Sample Number:	BRLTN03-MW01D-02	Sample Equipment:	submersible and HDPE
Duplicate:	-			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:		Date:	-	By:	-
Discharge Water Dispostion:	dumped on				
Comments:	-			Drum No.:	-
Prepared by:	Dan Chamberland				
Date Prepared:	12-Jul-2019				



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN		AOC:	3	Date:	06/15/2019		
Well ID:	BRLTN03-MW01S		Samplers:	Aaron Sutton							
Purge Start Date:	06/15/2019		Time:	09:40	Purge End Date:		06/15/2019	Time:	10:15		
Weather:	Wind:	6 mph, W	Precipitation:	None		Sky:	Mostly Cloudy	Temperature °F:	60		
Well Labeled:	No		Well Secured:	Yes		Comments:	-				
PID SN:	-		Well Headspace (PID mu):			-		Odor:	none		
Water Level Instrument:	Solinst					Serial No.:	288002				
SWL beginning (BTOC):	14.78		WL After pump install (BTOC):			14.78		Max Drawdown (in.):	0.5		
Well Casing (inches):	2		Borehole diameter:			6		Sandpack length (ft.):	14.5		
Screen Length:	12.5 - 22.5		Parameters Measured With:			YSI 14K100940					
Water Column height (ft.):	7.72		Total Purge Volume (gallons):			0.92		Purge Method:	Low Flow		
Max Purge Rate mL/min.:	100		Sampling Flow Rate mL/min:			100					
Pump Type:	peristaltic		Pump Vol.:	0		Tubing Material:	HDPE				
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	26.5	Total Pump + Tubing + Flow Cell Vol.:			0.0504		
Well Casing Vol. (gallons):	3.67		Sandpack Vol. (gal.):	4		Total Well Volume (gal.):			6.69		
Depth of pump inlet (BTOC):	17.2		Rationale:	Middle of screen							

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
09:40	0	0	14.94	12.3	6.06	4.94	91.9	2.98	-	20.1	-
09:45	5	0.132086	14.98	12.8	6.01	4.82	92.1	2.99	-	11.3	-
09:49	4	0.105669	14.95	12.5	6.01	4.58	87.4	2.96	-	11.3	-
09:55	6	0.158504	14.95	12.5	6.01	4.48	81.5	2.91	-	10.6	-
10:00	5	0.132086	14.95	12.5	6	4.55	79.9	2.9	-	8.37	-
10:05	5	0.132086	14.95	12.5	5.89	4.51	75.1	2.89	-	7.72	-
10:10	5	0.132086	14.95	12.6	6.02	4.5	72.9	2.89	-	7.09	-
10:15	5	0.132086	14.94	12.6	5.98	4.53	68.8	2.88	-	7.55	-

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
10:15	5	0.924603	14.94	12.6	5.98	4.53	68.8	2.88	-	7.55	0

Sample Type:		Sample Number:	BRLTN03-MW01S-01	Sample Equipment:	peristaltic and HDPE
Duplicate:	-			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:		Date:	-	By:	-
Discharge Water Dispostion:	55-gallon				
Comments:	-			Drum No.:	-
Prepared by:	Aaron Sutton				
Date Prepared:	16-Jun-2019				



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN		AOC:	3	Date:	07/10/2019		
Well ID:	BRLTN03-MW01S		Samplers:	Aaron Sutton							
Purge Start Date:	07/10/2019		Time:	10:22	Purge End Date:	07/10/2019		Time:	10:48		
Weather:	Wind:	2 mph, W	Precipitation:	None		Sky:	Partly Cloudy		Temperature °F:	78	
Well Labeled:	No		Well Secured:	Yes		Comments:	Well name on j plug				
PID SN:	592-919025			Well Headspace (PID mu):		0			Odor:	none	
Water Level Instrument:	Solinst					Serial No.:	251927				
SWL beginning (BTOC):	15.13			WL After pump install (BTOC):		15.13			Max Drawdown (in.):	0.6	
Well Casing (inches):	2			Borehole diameter:		6			Sandpack length (ft.):	14.5	
Screen Length:	12.5 - 22.5			Parameters Measured With:		YSI 16J101780					
Water Column height (ft.):	7.37		Total Purge Volume (gallons):		1.6		Purge Method:		Low Flow		
Max Purge Rate mL/min.:			215	Sampling Flow Rate mL/min:		215					
Pump Type:	peristaltic		Pump Vol.:	0		Tubing Material:	HDPE				
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	23	Total Pump + Tubing + Flow Cell Vol.:			0.0504		
Well Casing Vol. (gallons):	3.7			Sandpack Vol. (gal.):	3.96	Total Well Volume (gal.):			7.66		
Depth of pump inlet (BTOC):	17.2			Rationale:		Middle of water column					

PURGE CYCLE

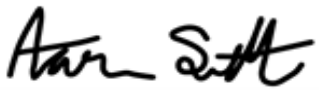
Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
10:22	0	0	15.21	13.8	6.56	3.61	113.8	1.62	-	20.4	No TDS
10:27	5	0.3	15.26	13.5	6.15	3.64	134.3	1.6	-	4.02	No TDS
10:32	6	0.3	15.26	12.7	6.06	3.7	142	1.64	-	4.11	No TDS
10:37	5	0.3	15.26	12.8	6.02	3.55	143.4	1.64	-	3.29	No TDS
10:42	5	0.3	15.26	12.8	6.01	3.35	145.2	1.64	-	4.71	No TDS
10:45	3	0.2	15.26	12.9	5.96	3.28	146.1	1.64	-	4.49	No TDS
10:48	3	0.2	15.26	12.8	5.97	3.18	146.2	1.62	-	5.34	No TDS

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
10:48	3	0.2	15.26	12.8	5.97	3.18	146.2	1.62	-	5.34	0

Sample Type:	MW	Sample Number:	BRLTN03-MW01S-02	Sample Equipment:	peristaltic and HDPE
Duplicate:	-			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:		Date:	-	By:	-
Discharge Water Dispostion:	dumped on				
Comments:	-			Drum No.:	-
Prepared by:	Aaron Sutton				
Date Prepared:	10-Jul-2019				



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN	AOC:	4	Date:	07/10/2019			
Well ID:	BRLTN04-MW01D		Samplers:	Dan Chamberland, Jessica Click							
Purge Start Date:	07/12/2019		Time:	14:05	Purge End Date:	07/12/2019	Time:	17:15			
Weather:	Wind:	10 mph, NE	Precipitation:	None	Sky:	Sunny	Temperature °F:	75			
Well Labeled:	Yes		Well Secured:	Yes	Comments:	-					
PID SN:	110-902597		Well Headspace (PID mu):		0		Odor:	none			
Water Level Instrument:	Solinst				Serial No.:	3010-1133					
SWL beginning (BTOC):	55.88		WL After pump install (BTOC):		55.15		Max Drawdown (in.):	161.88			
Well Casing (inches):	2		Borehole diameter:		6		Sandpack length (ft.):	14			
Screen Length:	64.24 - 74.24		Parameters Measured With:		YSI 17M100413						
Water Column height (ft.):	19.09		Total Purge Volume (gallons):		9.66		Purge Method:	Low Flow			
Max Purge Rate mL/min.:	300		Sampling Flow Rate mL/min:		300						
Pump Type:	submersible		Pump Vol.:	0.05	Tubing Material:	HDPE					
Flow Cell Vol.:	0.05	Vol./ft.: 0.01	Total ft.:	78.24	Total Pump + Tubing + Flow Cell Vol.:		0.101				
Well Casing Vol. (gallons):	12.11		Sandpack Vol. (gal.):	5.19	Total Well Volume (gal.):		17.3				
Depth of pump inlet (BTOC):	69		Rationale:		Halfway up the screen						

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
14:05	0	0	55.18	14.1	12.23	4.41	8.6	2.26	-	317	-
14:10	5	0.3	58.52	13.4	12.07	4.69	3.8	2.16	-	282	-
14:15	5	0.1	59.84	15.4	12.06	42.9	-6.9	2.2	-	263	-
14:20	5	0.1	60.35	15.4	12.1	4.15	-15.3	2.15	-	212	-
14:25	5	0.2	61.4	13.9	12.16	4.56	-21.7	1.99	-	225	-
14:30	5	0.3	62.31	15.5	12.12	4.15	-24.1	1.97	-	158	-
14:35	5	0.1	63.4	15.3	12.13	4.18	-24.8	1.94	-	126	-
14:40	5	0.3	64.14	14.5	12.16	4.31	-29.3	1.93	-	118	Issues maintaining flow rate
14:45	5	0.2	64.95	14.7	12.15	4.13	-30.3	1.9	-	104	-
14:50	5	0.4	65.47	14.4	12.12	4.07	-32.4	1.87	-	149	-
14:55	5	0.4	66.32	14.9	12.12	3.54	-33.9	1.58		313	-

Low-Flow Groundwater Purge And Sample Log

15:00	5	0.1	66.99	14.9	12.05	3.32	-33.7	1.45	-	356	Issues with keeping a constant flow rate
15:05	5	0.4	67.4	14.2	12.04	3.31	-33.6	1.48	-	386	-
15:10	5	0.3	68.02	14.4	12.09	3.27	-32.8	1.43	-	400	-
15:15	5	0.3	68.64		12.01	2.86	-33.5	1.29	-	297	-
15:20	5	0	-	-	11.96	2.84	-	-	-	-	Well ran dry at pump intake. Lowered pump and proceeded to pump dry. No sample taken.
17:09	109	5.8	71.81	15	11.43	4.9	-33.3	0.59	-	9999	Collected sample before readings due to minimal water volume.
17:12	3	0.2	72.33	12.8	11.65	5.08	-55.3	0.56	-	9999	-
17:15	3	0.2	73.1	14	11.42	4.27	-61.7	0.51	-	9999	-

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
17:15	3	0.2	73.1	14	11.42	4.27	-61.7	0.51	-	9999	0

Sample Type:	MW	Sample Number:	BRLTN04-MW01D-01	Sample Equipment:	submersible and HDPE
Duplicate:	-			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:		Date:	12-Jul-2019	By:	Dan Chamberland
Discharge Water Dispostion:	dumped on				
Comments:	Minimal recovery after being purged dry.			Drum No.:	-
Prepared by:	Dan Chamberland				
Date Prepared:	10-Jul-2019				

Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN		AOC:	4	Date:	07/14/2019		
Well ID:	BRLTN04-MW01D		Samplers:	Aaron Sutton, Jessica click							
Purge Start Date:	07/14/2019		Time:	10:54	Purge End Date:		07/14/2019	Time:	17:08		
Weather:	Wind:	5 mph, N	Precipitation:	None		Sky:	Partly Cloudy	Temperature °F:	78		
Well Labeled:	Yes		Well Secured:	Yes		Comments:	Well cap under slight pressure.				
PID SN:	110-014589				Well Headspace (PID mu):		0	Odor:	none		
Water Level Instrument:		Solinst					Serial No.:	306670			
SWL beginning (BTOC):		67.94			WL After pump install (BTOC):		67.9	Max Drawdown (in.):	66.36		
Well Casing (inches):		2			Borehole diameter:		6	Sandpack length (ft.):	14		
Screen Length:	64.5 - 74.5				Parameters Measured With:		YSI 14k100940				
Water Column height (ft.):		6.56	Total Purge Volume (gallons):		4.3		Purge Method:	Low Flow			
Max Purge Rate mL/min.:			400		Sampling Flow Rate mL/min:		400				
Pump Type:	submersible		Pump Vol.:		0.05		Tubing Material:	HDPE			
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	78.5	Total Pump + Tubing + Flow Cell Vol.:		0.101			
Well Casing Vol. (gallons):		12.15		Sandpack Vol. (gal.):	2.59	Total Well Volume (gal.):		14.74			
Depth of pump inlet (BTOC):		72		Rationale:		Middle of water column within well screen					

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
10:54	0	0	-	-	-	-	-	-	-	-	Pump on.
11:08	14	1.5	69.5	14	10.9	6.83	94.5	0.63	-	626	-
11:11	3	0.2	69.65	14.2	10.56	5.1	85.5	0.55	-	690	-
11:14	3	0.3	70.02	14.4	10.56	4.24	63.3	0.59	-	587	-
11:17	3	0.3	70.67	14.7	10.74	4.25	47.3	0.65	-	479	Difficulty with flow rate.
11:20	3	0.2	70.95	16.1	10.89	4.32	34	0.69	-	422	-
11:23	3	0.2	71.15	16.1	11.01	4.32	23	0.7	-	372	-
11:26	3	0.3	71.45	15.7	11.07	4.39	16.2	0.7	-	387	Issues with flow rate.

Low-Flow Groundwater Purge And Sample Log

11:29	3	0.3	71.76	14.4	11.11	4.63	9.7	0.65	-	426	Lost flow. Lowered pump to 73.5.
11:33	4	0.4	72.24	15.2	10.92	6.17	20.9	0.6	-	443	-
11:36	3	0.2	72.87	14.9	10.89	4.23	11.8	0.54	-	656	-
11:39	3	0.2	73.04	15.6	10.84	3.59	-13.9	0.54	-	1000	-
11:44	5	0.1	73.14	17.4	10.81	3.44	-45.1	0.54	-	1000	-
11:47	3	0	73.33	16.3	10.77	2.86	-106.3	0.5	-	1000	-
11:50	3	0.1	73.43	15.3	10.7	2.57	-130.2	0.487	-	1000	-
11:53	3	0	73.43	15	10.72	1.95	-167.2	0.482	-	1000	Water level below top of pump. Pump off 1155. Will return when well has
17:00	307	0	73.23						-		-
17:05	5	0	-	-	-	-	-	-	-	-	Collecting sample here, then taking parameters. Water level is very close to pump
17:08	3	0	73.6	13.2	10.51	7.64	71.1	0.415	-	9999999	No TDS

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
17:08	3	0	73.6	13.2	10.51	7.64	71.1	0.415	-	9999999	0

Sample Type:	MW	Sample Number:	BRLTN04-MW01D-02	Sample Equipment:	submersible and HDPE
Duplicate:	-			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	EB-BRLTN04-MW01D-00
Sample Equipment Decon:		Date:	14-Jul-2019	By:	Aaron Sutton
Discharge Water Dispostion:	dumped on				
Comments:	-			Drum No.:	-
Prepared by:	Jessica Click				
Date Prepared:	15-Jul-2019				



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN		AOC:	4	Date:	06/29/2019		
Well ID:	BRLTN04-MW01S		Samplers:	Dan Chamberland, Kylah Wyatt							
Purge Start Date:	06/29/2019		Time:	09:20	Purge End Date:		06/29/2019	Time:	10:25		
Weather:	Wind:	15 mph, NW	Precipitation:	None		Sky:	Overcast	Temperature °F:	65		
Well Labeled:	No		Well Secured:	Yes		Comments:	-				
PID SN:	592-919025				Well Headspace (PID mu):		0	Odor:	none		
Water Level Instrument:	Solinst						Serial No.:	3010-1204			
SWL beginning (BTOC):	11.85				WL After pump install (BTOC):		11.85	Max Drawdown (in.):	3		
Well Casing (inches):	2				Borehole diameter:		5	Sandpack length (ft.):	12		
Screen Length:	19.28 - 24.28				Parameters Measured With:		YSI 17M100413				
Water Column height (ft.):	12.93		Total Purge Volume (gallons):		2.6		Purge Method:	Low Flow			
Max Purge Rate mL/min.:			180		Sampling Flow Rate mL/min:		180				
Pump Type:	peristaltic		Pump Vol.:		0		Tubing Material:	HDPE			
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	27	Total Pump + Tubing + Flow Cell Vol.:		0.0504			
Well Casing Vol. (gallons):	3.96			Sandpack Vol. (gal.):	3.08	Total Well Volume (gal.):		7.04			
Depth of pump inlet (BTOC):	22			Rationale:		Not getting sediment off the bottom.					

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
09:20	0	0	11.85	12.2	12.45	9.21	-44.4	8.21	-	24.6	-
09:25	5	0.2	12.07	12.4	12.72	7.69	-55.8	8.4	-	25	No TDS
09:30	5	0.2	12.06	12.3	12.72	7.41	-73.5	8.34	-	20.7	-
09:35	5	0.2	12.07	12.1	12.69	7.42	-82.1	8.2	-	24	-
09:40	5	0.2	12.07	12	12.69	7.31	-86.5	8.03	-	24	No TDS
09:45	5	0.2	12.07	12	12.69	7.32	-88	7.92	-	19.7	-
09:50	5	0.2	12.08	12	12.7	7.33	-89.6	7.8	-	21.7	No TDS
09:55	5	0.2	12.09	12	12.71	7.29	-91.1	7.71	-	14	-
10:00	5	0.2	12.09	12.2	12.72	7.22	-92.5	7.62	-	10.4	-
10:05	5	0.2	12.09	12.1	12.75	7.22	-95.6	7.47	-	11	-
10:10	5	0.2	12.09	11.9	12.79	7.21	-97.3	7.35	-	11	-
10:15	5	0.2	12.09	12	12.81	7.22	-98.1	7.21	-	6.1	-
10:20	5	0.2	12.1	11.9	12.82	7.23	-97.9	7.1	-	6	-

Low-Flow Groundwater Purge And Sample Log

10:25	5	0.2	12.1	12	12.82	7.25	-98	7.06	-	6.08	-

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (^{o}C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
10:25	5	2.6	12.1	12	12.82	7.25	-98	7.06	-	6.08	0

Sample Type:	MW	Sample Number:	BRLTN04-MW01S-01	Sample Equipment:	peristaltic and HDPE		
Duplicate:	BRLTN04-MW01S-91			MS/MSD:	-		
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-		
Sample Equipment Decon:		Date:	-	By:	-	Discharge Water Dispostion:	dumped on
Comments:	-					Drum No.:	-
Prepared by:	Dan Chamberland						
Date Prepared:	29-Jun-2019						



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN		AOC:	4	Date:	07/12/2019		
Well ID:	BRLTN04-MW01S		Samplers:	Aaron Sutton, Jessica click							
Purge Start Date:	07/12/2019		Time:	16:40	Purge End Date:		07/12/2019	Time:	17:12		
Weather:	Wind:	3 mph, N	Precipitation:	Rain		Sky:	Mostly Cloudy	Temperature °F:	75		
Well Labeled:	Yes		Well Secured:	Yes		Comments:	-				
PID SN:	-			Well Headspace (PID mu):			-	Odor:	none		
Water Level Instrument:	Heron					Serial No.:	16820				
SWL beginning (BTOC):	12.1			WL After pump install (BTOC):			12.1	Max Drawdown (in.):	2.4		
Well Casing (inches):	2				Borehole diameter:		6	Sandpack length (ft.):	12		
Screen Length:	15 - 25				Parameters Measured With:		YSI				
Water Column height (ft.):	12.9		Total Purge Volume (gallons):		1.1		Purge Method:	Low Flow			
Max Purge Rate mL/min.:			150		Sampling Flow Rate mL/min:		150				
Pump Type:	peristaltic		Pump Vol.:		0		Tubing Material:	HDPE			
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	29	Total Pump + Tubing + Flow Cell Vol.:		0.0505			
Well Casing Vol. (gallons):	4.08			Sandpack Vol. (gal.):	4.7	Total Well Volume (gal.):		8.78			
Depth of pump inlet (BTOC):	20			Rationale:	Middle of screen						

PURGE CYCLE

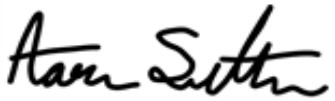
Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
16:40	0	0	-	-	-	-	-	-	-	-	Pump on
16:44	4	0.1	12.23	16.8	12.38	7.95	-1.7	4.66	-	11	No TDS
16:46	2	0.1	12.25	15.3	12.42	6.7	-9.4	4.33	-	9.09	No TDS
16:48	2	0.1	12.26	44.7	12.43	6.15	-16.1	4.22	-	9.34	No TDS
16:51	3	0.1	12.28	14.6	12.48	6.09	-20	4.6	-	7.41	No TDS
16:54	3	0.1	12.28	14.4	12.52	6.04	-24	4.3	-	7.24	No TDS
16:57	3	0.1	12.28	14.4	12.54	5.76	-28.2	4.35	-	8.2	No TDS
17:00	3	0.1	12.3	14.6	12.55	5.42	-31.7	4.38	-	4.65	No TDS
17:03	3	0.1	12.3	14.6	12.56	5.46	-34.7	4.43	-	11.8	No TDS
17:06	3	0.1	12.3	14.6	12.58	5.35	-37.1	4.43	-	7.15	No TDS
17:09	3	0.1	12.3	14.6	12.59	5.23	-39.3	4.42	-	7.63	No TDS
17:12	3	0.1	12.3	14.6	12.59	5.01	-41.2	4.4	-	7.36	No TDS

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
17:12	3	0.1	12.3	14.6	12.59	5.01	-41.2	4.4	-	7.36	0

Sample Type:	MW	Sample Number:	BRLTN04-MW01S-02	Sample Equipment:	peristaltic and HDPE
Duplicate:	BRLTN04-MW01S-92			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:	Date:	-	By:	-	Discharge Water Dispostion: dumped on
Comments:	-			Drum No.:	-
Prepared by:	Aaron Sutton				
Date Prepared:	17-Jul-2019				



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN		AOC:	Downgradient	Date:	06/18/2019		
Well ID:	BRLTNDG-MW01D		Samplers:	Aaron Sutton							
Purge Start Date:	06/18/2019		Time:	09:19	Purge End Date:	06/18/2019		Time:	11:29		
Weather:	Wind:	1 mph, W	Precipitation:	None		Sky:	Sunny		Temperature °F:	68	
Well Labeled:	No		Well Secured:	Yes		Comments:	-				
PID SN:	-			Well Headspace (PID mu):		-			Odor:	none	
Water Level Instrument:	Solinst					Serial No.:	251927				
SWL beginning (BTOC):	53.77			WL After pump install (BTOC):		53.75			Max Drawdown (in.):	2	
Well Casing (inches):	2			Borehole diameter:		6			Sandpack length (ft.):	8	
Screen Length:	70 - 75			Parameters Measured With:		YSI 14K100940					
Water Column height (ft.):	21.25		Total Purge Volume (gallons):	7.5		Purge Method:	Low Flow				
Max Purge Rate mL/min.:	450			Sampling Flow Rate mL/min:		450					
Pump Type:	submersible		Pump Vol.:	0.01		Tubing Material:	HDPE				
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	79	Total Pump + Tubing + Flow Cell Vol.:	0.061				
Well Casing Vol. (gallons):	12.89			Sandpack Vol. (gal.):	2.63	Total Well Volume (gal.):	15.52				
Depth of pump inlet (BTOC):	72.5			Rationale:		Middle of screen					

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
09:19	0	0	53.93	13.4	6.95	0.65	-224.8	0.58	-	60.3	No TDS
09:24	5	0.3	53.84	14.3	6.83	0.16	-386.5	0.62	-	140	No TDS
09:29	5	0.3	53.93	14	6.91	0.12	-414.7	0.62	-	56.6	No TDS
09:34	5	0.1	53.85	14.3	6.95	0.12	-427.3	0.63	-	59.3	No TDS
09:39	5	0.2	53.84	14.1	6.98	0.23	-402.8	0.63	-	28	No TDS
09:44	5	0.1	53.91	14.3	6.99	0.2	-432.5	0.63	-	13.3	No TDS
09:49	5	0.2	53.85	14.4	7.01	0.17	-425.6	0.64	-	11.1	No TDS
09:54	5	0.1	53.79	14.7	7.02	0.15	-399.9	0.64	-	10	No TDS
09:57	3	0.2	53.84	13.9	7.01	0.17	-405.4	0.63	-	9.15	No TDS
10:00	3	0.1	53.85	14.2	7	0.15	-413.9	0.63	-	8.75	No TDS
10:03	3	0.1	53.85	14.5	7.02	0.14	-418.3	0.64	-	8.72	No TDS
10:06	3	0.2	53.84	14.4	7.03	0.14	-423	0.64	-	9.05	No TDS

Low-Flow Groundwater Purge And Sample Log

10:33	27	2.9	53.95	13.8	7.17	0.51	-234.7	0.51	-	19.7	No TDS
10:38	5	0.3	53.95	14	7.04	0.23	-414.2	0.63	-	13.5	No TDS
10:50	12	0.6	53.8	14.2	7.11	0.27	-291	65	-	12.2	No TDS
10:55	5	0.2	53.85	15	7.05	0.15	-419.7	0.64	-	9.43	No TDS
11:00	5	0.2	53.81	15.1	7.06	0.17	-430.5	0.65	-	7.12	No TDS
11:05	5	0.2	53.83	14.6	7.06	0.15	-426.2	0.65	-	6.37	No TDS
11:10	5	0.6	53.96	14.7	7.07	0.13	-444.1	0.65	-	6.38	No TDS
11:15	5	0.1	53.8	15.2	7.08	0.12	-444.4	0.67	-	7.83	No TDS
11:20	5	0.1	53.8	14.6	7.07	0.11	-420.1	0.65	-	3.58	No TDS
11:25	5	0.1	53.8	14.9	7.05	0.11	-417.5	0.65	-	4.33	No TDS
11:29	4	0.3	53.85	14.6	7.05	0.11	-421.6	0.64	-	3.77	No TDS

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
11:29	4	7.5	53.85	14.6	7.05	0.11	-421.6	0.64	-	3.77	0

Sample Type:	MW	Sample Number:	BRLTNDG-MW01D-01	Sample Equipment:	submersible and HDPE
Duplicate:	-			MS/MSD:	MS/MSD--01
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:		Date:	18-Jun-2019	By:	Aaron Sutton
Discharge Water Dispostion:	55-gallon				
Comments:	Water level fluctuated throughout purge, but no more than 0.2 ft. Recharge seemed to interfere with the submersible pump, causing intermittent and variable flow.			Drum No.:	-
Prepared by:	Aaron Sutton				
Date Prepared:	18-Jun-2019				



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN	AOC:	Downgradient	Date:	07/12/2019			
Well ID:	BRLTNDG-MW01D		Samplers:	Dan Chamberland							
Purge Start Date:	07/12/2019		Time:	08:50	Purge End Date:	07/12/2019	Time:	09:53			
Weather:	Wind:	5 mph, NE	Precipitation:	None	Sky:	Mostly Cloudy	Temperature °F:	70			
Well Labeled:	No		Well Secured:	Yes	Comments:	-					
PID SN:	110-014589		Well Headspace (PID mu):		0		Odor:	none			
Water Level Instrument:	Solinst				Serial No.:	3010-1133					
SWL beginning (BTOC):	53.85		WL After pump install (BTOC):		53.86		Max Drawdown (in.):	1.8			
Well Casing (inches):	2		Borehole diameter:		6		Sandpack length (ft.):	8			
Screen Length:	70 - 75		Parameters Measured With:		YSI 17M100413						
Water Column height (ft.):	21.52		Total Purge Volume (gallons):		3.8		Purge Method:	Low Flow			
Max Purge Rate mL/min.:	250		Sampling Flow Rate mL/min:		250						
Pump Type:	submersible		Pump Vol.:		0.01		Tubing Material:	HDPE			
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	79	Total Pump + Tubing + Flow Cell Vol.:		0.061			
Well Casing Vol. (gallons):	12.23		Sandpack Vol. (gal.):		3.13	Total Well Volume (gal.):		15.36			
Depth of pump inlet (BTOC):	72.5		Rationale:		Halfway up screen						

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
08:50	0	0	54	14.7	6.84	1.91	129.8	0.6	-	345	-
08:55	5	0.3	54.15	12.3	6.81	0.77	-36.2	0.57	-	191	-
09:00	5	0.3	54.08	14.1	6.9	0.47	-49.7	0.61	-	57.5	-
09:05	5	0.3	54.08	13.5	6.98	0.4	-66	0.62	-	31.3	-
09:10	5	0.3	54.08	14.1	7.02	0.33	-74.7	0.63	-	19	-
09:15	5	0.3	54.05	14	7.06	0.27	-81.9	0.63	-	8.77	-
09:20	5	0.3	54.05	14.7	7.07	0.23	-83.4	0.64	-	7.34	-
09:25	5	0.3	54.05	14.9	7.08	0.2	-86.6	0.65	-	6.33	-
09:30	5	0.3	54.05	14.9	7.08	0.18	-87.9	0.65	-	5.79	-
09:35	5	0.3	54.08	15	7.09	0.16	-88.8	0.66	-	3.76	-
09:40	5	0.3	54.03	14.9	7.09	0.15	-89.6	0.66	-	3.87	-
09:45	5	0.3	54.02	15	7.1	0.13	-90.8	0.66	-	4.19	-

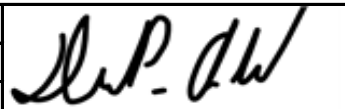
Low-Flow Groundwater Purge And Sample Log

09:50	5	0.3	54.02	15.1	7.1	0.13	-89.6	0.66	-	3.99	-
09:53	3	0.2	54.01	15	7.1	0.13	-90.2	0.67	-	3.88	-

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (^{o}C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
09:53	3	0.2	54.01	15	7.1	0.13	-90.2	0.67	-	3.88	0

Sample Type:	MW	Sample Number:	BRLTNDG-MW01D-02			Sample Equipment:	submersible and HDPE
Duplicate:	-					MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-			Equipment Rinsate Sample No.:	EB-BRLTNDG-MW01D-02
Sample Equipment Decon:		Date:	12-Jul-2019	By:	Dan Chamberland	Discharge Water Dispostion:	dumped on
Comments:	-					Drum No.:	-
Prepared by:	Dan Chamberland						
Date Prepared:	12-Jul-2019						



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN		AOC:	Downgradient	Date:	06/18/2019		
Well ID:	BRLTNDG-MW01S		Samplers:	Aaron Sutton							
Purge Start Date:	06/18/2019		Time:	13:36	Purge End Date:	06/18/2019		Time:	14:29		
Weather:	Wind:	4 mph, N	Precipitation:	None		Sky:	Sunny		Temperature °F:	77	
Well Labeled:	No		Well Secured:	Yes		Comments:	-				
PID SN:	-			Well Headspace (PID mu):		-			Odor:	none	
Water Level Instrument:	Solinst					Serial No.:	251927				
SWL beginning (BTOC):	53.63			WL After pump install (BTOC):		53.62			Max Drawdown (in.):	5.6	
Well Casing (inches):	2			Borehole diameter:		6			Sandpack length (ft.):	12.5	
Screen Length:	50.28 - 60.28			Parameters Measured With:		YSI 14K100940					
Water Column height (ft.):	6.66		Total Purge Volume (gallons):		5.2			Purge Method:		Low Flow	
Max Purge Rate mL/min.:			500	Sampling Flow Rate mL/min:		500					
Pump Type:	submersible		Pump Vol.:	0.01				Tubing Material:	HDPE		
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	64.28	Total Pump + Tubing + Flow Cell Vol.:			0.061		
Well Casing Vol. (gallons):	9.83			Sandpack Vol. (gal.):	2.61	Total Well Volume (gal.):			12.44		
Depth of pump inlet (BTOC):	57			Rationale:		Middle of water column within screened interval as screen is not fully submerged					

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
13:36	0	0	53.65	16	6.42	1.01	-126.2	0.51	-	9999999	No TDS
13:41	5	0.6	53.94	15.5	6.28	0.72	-174.7	0.51	-	765	No TDS
13:46	5	0.6	54.05	14.8	6.29	0.62	-186	0.5	-	339	No TDS
13:51	5	0.2	53.92	15.3	6.37	0.43	-208.1	0.499	-	143	No TDS
13:56	5	0.1	53.87	15.6	6.4	0.36	-231	0.51	-	60.7	No TDS
14:01	5	0.4	53.87	15.6	6.43	0.38	-231.9	0.51	-	56.9	No TDS
14:06	5	0.6	53.94	15.1	6.43	0.41	-225.1	0.51	-	41.6	No TDS
14:11	5	0.7	54.07	14.3	6.42	0.54	-197.3	0.494	-	40.7	No TDS
14:14	3	0.4	54.12	14	6.39	0.47	-209.8	0.493	-	24.2	No TDS
14:17	3	0.3	54.08	14.1	6.39	0.34	-231.7	0.496	-	16.4	No TDS
14:20	3	0.3	54.05	14.2	6.41	0.29	-249.9	0.499	-	11.3	No TDS
14:23	3	0.3	54	14.4	6.43	0.27	-251.1	0.5	-	9.15	No TDS
14:26	3	0.3	54.01	14.4	6.44	0.27	-260.8	0.5	-	8.46	No TDS

Low-Flow Groundwater Purge And Sample Log

14:29	3	0.4	54.09	14.2	6.43	0.41	-218	0.498	-	8.35	No TDS

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
14:29	3	5.2	54.09	14.2	6.43	0.41	-218	0.498	-	8.35	0

Sample Type:	MW	Sample Number:	BRLTNDG-MW01S-01	Sample Equipment:	submersible and HDPE
Duplicate:	-			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	BRLTN-061819-EB
Sample Equipment Decon:		Date:	18-Jun-2019	By:	Aaron Sutton
Discharge Water Dispostion:	55-gallon				
Comments:	EB taken between groundwater samples @ 12:38			Drum No.:	-
Prepared by:	Aaron Sutton				
Date Prepared:	18-Jun-2019				



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN	AOC:	Downgradient	Date:	07/11/2019			
Well ID:	BRLTNDG-MW01S		Samplers:	Dan Chamberland							
Purge Start Date:	07/11/2019		Time:	14:45	Purge End Date:	07/11/2019	Time:	16:01			
Weather:	Wind:	15 mph, NW	Precipitation:	None	Sky:	Mostly Cloudy	Temperature °F:	75			
Well Labeled:	Yes		Well Secured:	Yes	Comments:	-					
PID SN:	-		Well Headspace (PID mu):		-		Odor:	none			
Water Level Instrument:	Solinst				Serial No.:	3010-1204					
SWL beginning (BTOC):	54.15		WL After pump install (BTOC):		53.72		Max Drawdown (in.):	3.72			
Well Casing (inches):	2		Borehole diameter:		6		Sandpack length (ft.):	12.5			
Screen Length:	50.28 - 60.28		Parameters Measured With:		YSI 14H100036						
Water Column height (ft.):	6.56		Total Purge Volume (gallons):		4.3		Purge Method:	Low Flow			
Max Purge Rate mL/min.:	250		Sampling Flow Rate mL/min:		250						
Pump Type:	submersible		Pump Vol.:		0.01		Tubing Material:	HDPE			
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	61	Total Pump + Tubing + Flow Cell Vol.:		0.061			
Well Casing Vol. (gallons):	9.83		Sandpack Vol. (gal.):		2.57	Total Well Volume (gal.):		12.4			
Depth of pump inlet (BTOC):	57		Rationale:		Splitting the difference between the well bottom and the water level.						

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
14:45	0	0	54.1	15.1	6.69	0.64	64.5	0.42	-	357	-
14:50	5	0.3	54.03	15.4	6.63	0.36	57.5	0.424	-	381	-
14:55	5	0.3	54	15.7	6.6	0.33	51.4	0.425	-	254	-
15:00	5	0.3	54.02	15.7	6.59	0.23	47.7	0.419	-	118	-
15:05	5	0.3	54.02	15.7	6.58	0.21	46.1	0.413	-	56.5	-
15:10	5	0.3	54.01	15.6	6.6	0.16	43.3	0.412	-	25.2	-
15:15	5	0.3	54.02	15.6	6.6	0.16	42.9	0.41	-	26.7	-
15:20	5	0.3	54.01	16.1	6.6	0.14	41.1	0.415	-	22	-
15:25	5	0.3	54	16.7	6.6	0.1	39.7	0.422	-	12.7	-
15:30	4	0.3	53.99	16.6	6.61	0.11	38.5	0.423	-	9.2	-
15:35	5	0.3	53.97	16	6.61	0.1	37	0.417	-	10	-
15:40	5	0.3	53.97	16.5	6.61	0.11	35.3	0.421	-	14.9	-

Low-Flow Groundwater Purge And Sample Log

15:45	5	0.3	53.97	16.3	6.61	0.11	34.8	0.417	-	12.6	-
15:50	5	0.3	53.97	16.2	6.61	0.1	33.6	0.418	-	11.1	-
15:55	5	0	53.98	16.2	6.61	0.1	32.6	0.416	-	10.8	-
16:00	5	0.3	53.98	16.4	6.61	0.1	31.9	0.416	-	10.2	-
16:01	1	0.1	53.98	16.3	6.61	0.1	31.7	0.417	-	9.92	-

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
16:01	1	0.1	53.98	16.3	6.61	0.1	31.7	0.417	-	9.92	0

Sample Type:	MW	Sample Number:	BRLTNDG-MW01S-02	Sample Equipment:	submersible and HDPE
Duplicate:	-			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:		Date:	11-Jul-2019	By:	Dan Chamberland
Discharge Water Dispostion:	dumped on				
Comments:	-			Drum No.:	-
Prepared by:	Dan Chamberland				
Date Prepared:	11-Jul-2019				



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN		AOC:	Downgradient	Date:	07/11/2019		
Well ID:	BRLTNDG-MW02S		Samplers:	Jessica click							
Purge Start Date:	07/11/2019		Time:	14:03	Purge End Date:	07/11/2019		Time:	14:57		
Weather:	Wind:	5 mph, W	Precipitation:	None		Sky:	Mostly Cloudy	Temperature °F:	85		
Well Labeled:	Yes		Well Secured:	Yes		Comments:	-				
PID SN:	592-919025		Well Headspace (PID mu):			0		Odor:	none		
Water Level Instrument:	Solinst					Serial No.:	288002				
SWL beginning (BTOC):	12.12		WL After pump install (BTOC):			12.12		Max Drawdown (in.):	6.8		
Well Casing (inches):	2		Borehole diameter:			6		Sandpack length (ft.):	11		
Screen Length:	4.8 - 14.8		Parameters Measured With:			YSI 17M100413					
Water Column height (ft.):	2.68		Total Purge Volume (gallons):		1.3		Purge Method:	Low Flow			
Max Purge Rate mL/min.:	125		Sampling Flow Rate mL/min:			100					
Pump Type:	peristaltic		Pump Vol.:	0		Tubing Material:	HDPE				
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	18.8	Total Pump + Tubing + Flow Cell Vol.:		0.0503			
Well Casing Vol. (gallons):	2.41		Sandpack Vol. (gal.):	1.05		Total Well Volume (gal.):		3.45			
Depth of pump inlet (BTOC):	13		Rationale:	Water level at 12ft and bottom of screen is 14ft							

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
14:03	0	0	12.19	13.5	8.03	9.49	99.6	0.225	-	95.4	-
14:08	5	0	12.31	12.9	7.86	8.67	105.6	0.215	-	79.9	-
14:11	3	0.1	12.39	12.6	7.78	8.79	110.1	0.213	-	72	-
14:14	3	0.1	12.44	12.9	7.72	8.21	112.3	0.214	-	54.5	-
14:17	3	0.1	12.5	12.6	7.73	8.76	112.9	0.214	-	43.4	-
14:20	3	0.1	12.53	12.8	7.71	8.54	113.6	0.214	-	29.9	-
14:23	3	0.1	12.56	13	7.72	8.68	113.3	0.215	-	21.6	-
14:26	3	0.1	12.59	13	7.72	8.35	113.6	0.217	-	19.9	-
14:29	3	0.1	12.6	12.9	7.71	8.3	114.8	0.219	-	16.2	-
14:32	3	0.1	12.63	13.2	7.71	8.19	115.5	0.221	-	14.2	-
14:35	3	0	12.65	13.1	7.71	8.08	115.9	0.222	-	15.2	-
14:38	3	0.1	12.67	13.2	7.69	8.17	117.5	0.224	-	9.78	-

Low-Flow Groundwater Purge And Sample Log

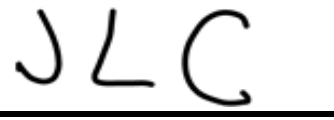
14:41	3	0.1	12.69	12.9	7.68	7.64	118.3	0.222	-	10.1	-
14:44	3	0	12.71	13	7.67	7.71	119.5	0.225	-	8.89	-
14:47	3	0.1	12.72	13	7.67	7.64	119	0.227	-	8.39	-
14:50	3	0.1	12.72	13.2	7.66	7.7	120.1	0.227	-	7.3	-
14:53	3	0.1	12.73	13.1	7.64	7.55	121.4	0.228	-	6.87	-
14:56	3	0	12.73	12.9	7.64	7.45	121.7	0.228	-	7.36	-
14:57	1	0	12.76	12.9	7.64	7.77	122.1	0.228	-	7.39	Final parameters. Sample time 1500 on 7-11-19.

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
14:57	1	0	12.76	12.9	7.64	7.77	122.1	0.228	-	7.39	0

Sample Type:	MW	Sample Number:	BRLTNDG-MW02S-01	Sample Equipment:	peristaltic and HDPE
Duplicate:	-			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:		Date:	-	By:	-
Discharge Water Dispostion:	dumped on				
Comments:	-			Drum No.:	-
Prepared by:	Jessica Click				
Date Prepared:	11-Jul-2019				



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN		AOC:	Downgradient	Date:	07/13/2019		
Well ID:	BRLTNDG-MW02S		Samplers:	Aaron Sutton							
Purge Start Date:	07/14/2019		Time:	15:01	Purge End Date:	07/14/2019		Time:	16:01		
Weather:	Wind:	1 mph, NE	Precipitation:	None		Sky:	Sunny	Temperature °F:	85		
Well Labeled:	No		Well Secured:	Yes		Comments:	Well name on j plug				
PID SN:	592-919025U4			Well Headspace (PID mu):		0		Odor:	none		
Water Level Instrument:	Heron					Serial No.:	16820				
SWL beginning (BTOC):	12.09			WL After pump install (BTOC):		12.09		Max Drawdown (in.):	13.32		
Well Casing (inches):	2			Borehole diameter:		6		Sandpack length (ft.):	11		
Screen Length:	4.8 - 14.8			Parameters Measured With:		YSI 16J101780					
Water Column height (ft.):	2.71		Total Purge Volume (gallons):	2.8		Purge Method:	Low Flow				
Max Purge Rate mL/min.:	200		Sampling Flow Rate mL/min:	200							
Pump Type:	peristaltic		Pump Vol.:	0		Tubing Material:	HDPE				
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	16.5	Total Pump + Tubing + Flow Cell Vol.:	0.0503				
Well Casing Vol. (gallons):	2.41		Sandpack Vol. (gal.):	1.06		Total Well Volume (gal.):	3.47				
Depth of pump inlet (BTOC):	13.5		Rationale:	Middle of water column							

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
15:01	0	0	-	-	-	-	-	-	-	-	Pump on
15:05	4	0.2	12.42	11.7	7.35	9.12	153.1	0.203	-	58.7	No TDS
15:10	5	0.3	12.61	11.6	7.42	8.8	154.8	0.2	-	40.2	No TDS
15:15	5	0.3	12.8	11.4	7.39	8.85	156.3	0.203	-	41.1	No TDS
15:20	5	0.3	12.95	11.5	7.4	8.29	158.3	0.207	-	38.3	No TDS
15:25	5	0.3	13.06	11.7	7.41	7.97	161.1	0.212	-	32.5	No TDS
15:30	5	0.2	13.12	11.9	7.37	7.95	162.4	0.218	-	27.2	No TDS
15:35	5	0.2	13.15	12	7.36	7.08	164.2	0.223	-	16.6	No TDS
15:40	5	0.2	13.15	11.9	7.37	7.02	164.7	0.227	-	10.8	No TDS
15:45	5	0.2	13.16	11.9	7.35	7.2	165.2	0.227	-	8.13	No TDS
15:50	5	0.2	13.17	12	7.36	6.77	165.9	0.229	-	8.39	No TDS
15:55	5	0.2	13.18	12.1	7.36	6.82	165.7	0.23	-	6.25	No TDS

Low-Flow Groundwater Purge And Sample Log

15:58	3	0.1	13.18	12.1	7.36	6.91	165.8	0.23	-	6.31	No TDS
16:01	3	0.1	13.2	12.3	7.37	6.79	165.9	0.231	-	6.95	No TDS

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
16:01	3	0.1	13.2	12.3	7.37	6.79	165.9	0.231	-	6.95	0

Sample Type:	MW	Sample Number:	BRLTNDG-MW02S-02	Sample Equipment:	peristaltic and HDPE
Duplicate:	-			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:		Date:	-	By:	-
Discharge Water Dispostion:	dumped on				
Comments:	-			Drum No.:	-
Prepared by:	Aaron Sutton				
Date Prepared:	14-Jul-2019				



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN		AOC:	Downgradient	Date:	07/11/2019		
Well ID:	BRLTNDG-MW03D		Samplers:	Jessica Click							
Purge Start Date:	07/11/2019		Time:	11:20	Purge End Date:	07/11/2019		Time:	11:59		
Weather:	Wind:	3 mph, W	Precipitation:	None		Sky:	Mostly Cloudy		Temperature °F:	80	
Well Labeled:	Yes		Well Secured:	Yes		Comments:	-				
PID SN:	592-919025		Well Headspace (PID mu):			0			Odor:	none	
Water Level Instrument:	Solinst					Serial No.:	28002				
SWL beginning (BTOC):	11.89		WL After pump install (BTOC):			11.89			Max Drawdown (in.):	14.2	
Well Casing (inches):	2				Borehole diameter:	6			Sandpack length (ft.):	13	
Screen Length:	23 - 33				Parameters Measured With:		YSI 17m100413				
Water Column height (ft.):	21.25		Total Purge Volume (gallons):		2				Purge Method:	Low Flow	
Max Purge Rate mL/min.:			175		Sampling Flow Rate mL/min:		175				
Pump Type:	peristaltic		Pump Vol.:		0				Tubing Material:	HDPE	
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	37	Total Pump + Tubing + Flow Cell Vol.:				0.0506	
Well Casing Vol. (gallons):	5.38			Sandpack Vol. (gal.):		4.7	Total Well Volume (gal.):			10.08	
Depth of pump inlet (BTOC):	28			Rationale:		Middle of screen					

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
11:20	0	0	12.55	13.9	7.65	7.87	114.6	0.448	-	16.3	-
11:25	5	0.2	12.68	14.6	7.49	5.69	120.7	0.454	-	19.6	-
11:30	5	0.2	12.64	15.2	7.52	5.06	116.7	0.464	-	17.5	-
11:33	3	0.1	12.64	15	7.52	5.54	115	0.461	-	16.6	-
11:36	3	0.1	12.65	15	7.51	5.07	113.9	0.459	-	11	-
11:39	3	0.1	12.65	14.9	7.51	5.48	113.6	0.459	-	17.3	-
11:42	3	0.1	12.67	14.9	7.51	5.46	112.9	0.457	-	10.1	-
11:45	3	0.1	12.68	15	7.51	5.17	111.4	0.459	-	13.2	-
11:48	3	0.1	12.69	14.6	7.5	4.82	110.5	0.455	-	8.72	-
11:51	3	0.1	12.71	14.7	7.51	4.87	109.8	0.455	-	9.25	-
11:54	3	0.1	12.73	14.7	7.5	4.63	109.4	0.456	-	9.76	-
11:57	3	0	12.74	14.6	7.51	5.06	108.7	0.454	-	10	-

Low-Flow Groundwater Purge And Sample Log

11:59	2	0.1	12.74	14.8	7.5	4.87	108.5	0.457	-	9.83	These are final parameters before sampling. Sample time is 12:10 on 7-11-19.

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
11:59	2	0.1	12.74	14.8	7.5	4.87	108.5	0.457	-	9.83	0

Sample Type:	MW	Sample Number:	BRLTNDG-MW03D-01	Sample Equipment:	peristaltic and HDPE
Duplicate:	-			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:		Date:	-	By:	-
Discharge Water Dispostion:	dumped on				
Comments:	-			Drum No.:	-
Prepared by:	Jessica Click				
Date Prepared:	11-Jul-2019				



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN		AOC:	Downgradient	Date:	07/13/2019		
Well ID:	BRLTNDG-MW03D		Samplers:	Jessica click							
Purge Start Date:	07/13/2019		Time:	12:48	Purge End Date:	07/13/2019		Time:	13:49		
Weather:	Wind:	3 mph, W	Precipitation:	None		Sky:	Sunny	Temperature °F:	86		
Well Labeled:	Yes		Well Secured:	Yes		Comments:	-				
PID SN:	110-014589		Well Headspace (PID mu):	0				Odor:	none		
Water Level Instrument:	Solinst					Serial No.:	251927				
SWL beginning (BTOC):	12.06		WL After pump install (BTOC):	12.06				Max Drawdown (in.):	7.2		
Well Casing (inches):	2				Borehole diameter:	6		Sandpack length (ft.):	12		
Screen Length:	23 - 33				Parameters Measured With:	YSI 14K100940					
Water Column height (ft.):	20.94		Total Purge Volume (gallons):	2				Purge Method:	Low Flow		
Max Purge Rate mL/min.:	100				Sampling Flow Rate mL/min:	100					
Pump Type:	peristaltic		Pump Vol.:	0				Tubing Material:	HDPE		
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	12.5	Total Pump + Tubing + Flow Cell Vol.:			0.0502		
Well Casing Vol. (gallons):	5.39				Sandpack Vol. (gal.):	4.7	Total Well Volume (gal.):		10.09		
Depth of pump inlet (BTOC):	27				Rationale:	Midscreen. 10 ft screen.					

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
12:48	0	0	-	-	-	-	-	-	-	-	Pump on
12:51	3	0.1	12.23	15.2	7.61	3.04	157	0.55	-	14.2	-
12:54	3	0.1	12.36	15.1	7.53	2.44	163	0.54	-	20.2	-
12:57	3	0.1	12.42	15.3	7.49	2.06	167.1	0.54	-	14	-
13:00	3	0.1	12.45	15.2	7.48	1.8	170	0.54	-	13	-
13:03	3	0.1	12.47	15.2	7.47	1.52	172.7	0.54	-	10.5	-
13:06	3	0.1	12.5	15	7.46	1.4	175.2	0.54	-	11.4	-
13:09	3	0.1	12.51	14.8	7.44	1.15	177.1	0.54	-	24.8	-
13:12	3	0.1	12.54	14.7	7.45	1.02	178.3	0.53	-	17.5	-
13:15	3	0.1	12.55	14.9	7.42	0.98	179.4	0.53	-	9.34	-
13:18	3	0.1	12.57	14.8	7.44	0.92	180.3	0.53	-	13.4	-
13:21	3	0.1	12.58	14.9	7.47	0.84	180.3	0.53	-	17.8	-

Low-Flow Groundwater Purge And Sample Log

13:24	3	0.1	12.59	14.9	7.46	0.74	180.3	0.53	-	22.3	-
13:27	3	0.1	12.6	14.9	7.48	0.73	179.4	0.53	-	10.6	-
13:30	3	0.1	12.59	15.2	7.49	0.7	178.7	0.53	-	11.8	-
13:33	3	0.1	12.59	14.8	7.51	0.68	178	0.53	-	13.6	-
13:37	4	0.1	12.6	15	7.5	0.65	178.4	0.53	-	15.1	-
13:40	3	0.1	12.61	14.6	7.52	0.66	177.5	0.53	-	9.69	-
13:43	3	0.1	12.64	14.5	7.53	0.65	177.7	0.53	-	8.2	-
13:46	3	0.1	12.65	14.6	7.53	0.65	177.3	0.53	-	7.9	-
13:49	3	0.1	12.66	14.8	7.54	0.64	177.5	0.53	-	8.87	Sampling now. Turbidity is stable within range of turbidity meter. Turbidity is below 10 NTU and within 1 NTU. All parameters are stable.

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
13:49	3	0.1	12.66	14.8	7.54	0.64	177.5	0.53	-	8.87	0

Sample Type:	MW	Sample Number:	BRLTNDG-MW03D-02	Sample Equipment:	peristaltic and HDPE
Duplicate:	-			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:		Date:	-	By:	-
Discharge Water Dispostion:	dumped on				
Comments:	Dedicated equipment			Drum No.:	-
Prepared by:	Other	JLC			
Date Prepared:	13-Jul-2019				

Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN		AOC:	Downgradient	Date:	07/12/2019		
Well ID:	BRLTNDG-MW03S		Samplers:	Jessica click							
Purge Start Date:	07/12/2019		Time:	11:45	Purge End Date:	07/10/2019		Time:	13:12		
Weather:	Wind:	1 mph, N	Precipitation:	None		Sky:	Partly Cloudy	Temperature °F:	82		
Well Labeled:	Yes		Well Secured:	Yes		Comments:	-				
PID SN:	592-919025		Well Headspace (PID mu):		0			Odor:	none		
Water Level Instrument:	Solinst					Serial No.:	251927				
SWL beginning (BTOC):	4.09		WL After pump install (BTOC):		4.09			Max Drawdown (in.):	40.8		
Well Casing (inches):	2		Borehole diameter:		6			Sandpack length (ft.):	7		
Screen Length:	7 - 12		Parameters Measured With:		YSI 17m100413						
Water Column height (ft.):	7.91		Total Purge Volume (gallons):		2.4			Purge Method:	Low Flow		
Max Purge Rate mL/min.:			100	Sampling Flow Rate mL/min:			100				
Pump Type:	peristaltic		Pump Vol.:	0				Tubing Material:	HDPE		
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	16	Total Pump + Tubing + Flow Cell Vol.:			0.0503		
Well Casing Vol. (gallons):	1.96		Sandpack Vol. (gal.):		2.74	Total Well Volume (gal.):			4.7		
Depth of pump inlet (BTOC):	9		Rationale:		5 ft screen. Midscreen.						

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
11:45	0	0	-	-	-	-	-	-	-	-	Pump on
11:49	4	0.1	4.59	18	7.84	7.6	80.9	0.339	-	29.9	-
11:52	3	0.1	5.04	17.9	7.81	6.48	76.4	0.337	-	25	-
11:55	3	0	5.38	18.4	7.76	6.68	75.8	0.339	-	24.7	Pump off. Heavy rain
11:58	3	0.1	5.71	18.6	7.73	6.82	74.8	0.336	-	28.1	-
12:01	3	0.1	6.01	18.8	7.69	6.39	75	0.332	-	26.6	-
12:04	3	0.1	6.27	19.1	7.65	6.73	75.7	0.329	-	24.1	-
12:17	13	0.3	5.91	21.4	7.62	6.04	85.5	0.338	-	33.8	Pump on
12:20	3	0.1	6.02	19.9	7.63	6.11	95	0.336	-	39.9	-
12:23	3	0.1	6.14	19.8	7.64	5.99	101	6.06	-	39.6	-
12:26	3	0.1	6.24	20.7	7.62	6.16	104.5	0.343	-	38.5	-
12:29	3	0	6.37	21.2	7.63	6.25	82.3	0.35	-	35.3	-

Low-Flow Groundwater Purge And Sample Log

12:32	3	0.1	6.48	20.8	7.65	5.72	72.5	0.351	-	31.2	-
12:35	3	0	6.62	20.6	7.65	6.17	71	0.351	-	27.7	-
12:38	3	0.1	6.75	19.7	7.65	5.52	69.2	0.345	-	25.7	-
12:41	3	0.1	6.87	19.3	7.65	6.01	69.7	0.341	-	25	-
12:44	3	0.1	6.99	20.2	7.64	6.08	71	0.344	-	21.9	-
12:47	3	0.1	7.12	20.1	7.64	5.92	70.1	0.341	-	26.8	-
12:50	3	0.1	7.15	19.9	7.64	6.31	69.2	0.339	-	33.9	-
12:53	3	0.1	7.19	20	7.6	5.88	67.7	0.341	-	33.5	-
12:56	3	0.1	7.24	19.8	7.65	6.1	67.1	0.341	-	37.6	-
12:59	3	0.1	7.29	19.4	7.64	6.38	67.9	0.341	-	44.1	-
13:02	3	0.1	7.31	19.2	7.65	6.27	68.1	0.335	-	47.4	-
13:05	3	0.1	7.39	18.6	7.65	6.45	70.3	0.333	-	56.8	-
13:08	3	0.1	7.44	18.7	7.65	6.21	72.6	0.331	-	60.1	-
13:11	3	0.1	7.47	18.5	7.66	6.2	74.7	0.327	-	59.9	-
13:12	1	0	7.49	18.5	7.65	6.17	75.2	0.326	-	64	Sample time 1312 on 7-12-19.

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
13:12	1	0	7.49	18.5	7.65	6.17	75.2	0.326	-	64	0

Sample Type:	MW	Sample Number:	BRLTNDG-MW03S-01	Sample Equipment:	peristaltic and HDPE
Duplicate:	-			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:		Date:	-	By:	-
Discharge Water Dispostion:	dumped on				
Comments:	Dedicated equipment			Drum No.:	-
Prepared by:	Jessica Click				
Date Prepared:	12-Jul-2019				



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN		AOC:	Downgradient	Date:	07/14/2019		
Well ID:	BRLTNDG-MW03S		Samplers:	Aaron Sutton, Jessica Click							
Purge Start Date:	07/14/2019		Time:	14:58	Purge End Date:	07/14/2019		Time:	15:31		
Weather:	Wind:	0 mph, E	Precipitation:	None		Sky:	Sunny	Temperature °F:	76		
Well Labeled:	Yes		Well Secured:	Yes		Comments:	-				
PID SN:	110-014589		Well Headspace (PID mu):			0		Odor:	none		
Water Level Instrument:	Solinst					Serial No.:	-				
SWL beginning (BTOC):	4.76		WL After pump install (BTOC):			4.76		Max Drawdown (in.):	28.44		
Well Casing (inches):	2		Borehole diameter:			6		Sandpack length (ft.):	7		
Screen Length:	7 - 12		Parameters Measured With:			YSI 14K100940					
Water Column height (ft.):	7.24		Total Purge Volume (gallons):			1.1		Purge Method:	Low Flow		
Max Purge Rate mL/min.:			150		Sampling Flow Rate mL/min:			150			
Pump Type:	peristaltic		Pump Vol.:		0			Tubing Material:	HDPE		
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	13	Total Pump + Tubing + Flow Cell Vol.:			0.0502		
Well Casing Vol. (gallons):	1.96		Sandpack Vol. (gal.):		2.74	Total Well Volume (gal.):			4.7		
Depth of pump inlet (BTOC):	9		Rationale:		Middle of screen						

PURGE CYCLE

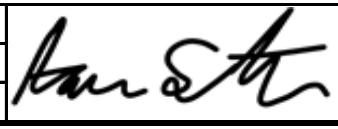
Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
14:58	0	0	-	-	-	-	-	-	-	-	Pump on
15:01	3	0.1	5.24	18.3	7.88	1.06	183.7	0.355	-	152	No TDS
15:04	3	0.1	5.43	19.5	7.58	0.87	199	0.355	-	41.6	No TDS
15:07	3	0.1	5.75	20	7.63	0.82	198	0.36	-	24.5	No TDS
15:10	3	0.1	6.01	18.2	7.67	0.88	197.3	0.386	-	33.3	No TDS
15:13	3	0.1	6.25	17.2	7.6	0.84	201.5	0.387	-	59.8	No TDS
15:16	3	0.1	6.48	16.8	7.58	0.85	203.3	0.381	-	60.6	No TDS
15:19	3	0.1	6.64	17.1	7.58	0.83	203.8	0.383	-	45.2	No TDS
15:22	3	0.1	6.9	17.2	7.54	0.81	205.3	0.378	-	42.7	No TDS
15:25	3	0.1	7.04	17.3	7.58	0.8	203.4	0.371	-	30.5	No TDS
15:28	3	0.1	7.08	17.4	7.58	0.78	202.1	0.371	-	27.9	No TDS
15:31	3	0.1	7.13	17.6	7.59	0.75	201.1	0.361	-	28.1	No TDS

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
15:31	3	0.1	7.13	17.6	7.59	0.75	201.1	0.361	-	28.1	0

Sample Type:	MW	Sample Number:	BRLTNDG-MW03S-02	Sample Equipment:	peristaltic and HDPE
Duplicate:	-			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:		Date:	-	By:	-
Discharge Water Dispostion:	dumped on				
Comments:	-			Drum No.:	-
Prepared by:	Aaron Sutton				
Date Prepared:	14-Jul-2019				



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN	AOC:	Downgradient	Date:	07/09/2019			
Well ID:	BRLTNDG-MW04D		Samplers:	Aaron Sutton							
Purge Start Date:	07/09/2019		Time:	14:09	Purge End Date:	07/09/2019	Time:	15:08			
Weather:	Wind:	0 mph, NW	Precipitation:	None	Sky:	Mostly Cloudy	Temperature °F:	87			
Well Labeled:	No		Well Secured:	Yes	Comments:	Well name on j plug					
PID SN:	-		Well Headspace (PID mu):		0		Odor:	none			
Water Level Instrument:	Solinst				Serial No.:	288002					
SWL beginning (BTOC):	9.81		WL After pump install (BTOC):		9.81		Max Drawdown (in.):	0.6			
Well Casing (inches):	2		Borehole diameter:		6		Sandpack length (ft.):	7			
Screen Length:	19 - 24		Parameters Measured With:		YSI 14K100940						
Water Column height (ft.):	14.19		Total Purge Volume (gallons):		2.3		Purge Method:	Low Flow			
Max Purge Rate mL/min.:	200		Sampling Flow Rate mL/min:		200						
Pump Type:	peristaltic		Pump Vol.:		0		Tubing Material:	HDPE			
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	25.5	Total Pump + Tubing + Flow Cell Vol.:		0.0504			
Well Casing Vol. (gallons):	3.9		Sandpack Vol. (gal.):		2.35	Total Well Volume (gal.):		6.25			
Depth of pump inlet (BTOC):	21.5		Rationale:		Middle of screen						

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
14:09	0	0	9.81	13.6	6.25	0.62	-94.5	0.53	-	91.5	No TDS
14:14	5	0.2	9.84	13.4	6.14	0.51	-92.9	0.52	-	47.8	No TDS
14:19	5	0.2	9.86	12.9	6.12	0.41	-91.6	0.52	-	52.8	No TDS
14:24	5	0.2	9.85	12.6	6.13	0.34	-90.8	0.51	-	53.2	No TDS
14:29	5	0.2	9.85	12.4	6.15	0.31	-90.1	0.51	-	50.3	No TDS
14:34	5	0.2	9.85	12.6	6.19	0.28	-92.9	0.52	-	31.2	No TDS
14:39	5	0.2	9.85	12.4	6.2	0.26	-93.9	0.51	-	35.1	No TDS
14:44	5	0.2	9.85	12.3	6.25	0.25	-95.6	0.52	-	21.9	No TDS
14:49	5	0.2	9.85	12.5	6.26	0.24	-96.9	0.53	-	21.3	No TDS
14:53	4	0.2	9.85	12.2	6.25	0.22	-98	0.53	-	17	No TDS
14:59	6	0.2	9.85	12.4	6.28	0.22	-98.3	0.54	-	16.6	No TDS
15:02	3	0.1	9.85	12.2	6.26	0.22	-98.6	0.54	-	14.7	No TDS

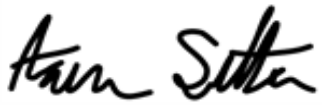
Low-Flow Groundwater Purge And Sample Log

15:05	3	0.1	9.85	12	6.27	0.22	-98.9	0.54	-	14.8	No TDS
15:08	3	0.1	9.86	12.2	6.28	0.21	-99.8	0.54	-	13.9	No TDS

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (^{o}C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
15:08	3	0.1	9.86	12.2	6.28	0.21	-99.8	0.54	-	13.9	0

Sample Type:	MW	Sample Number:	BRLTNDG-MW04D-01	Sample Equipment:	peristaltic and HDPE
Duplicate:	-			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:		Date:	-	By:	-
Discharge Water Dispostion:	dumped on				
Comments:	-			Drum No.:	-
Prepared by:	Aaron Sutton				
Date Prepared:	09-Jul-2019				



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001	Site:	BRLTN	AOC:	Downgradient	Date:	07/12/2019				
Well ID:	BRLTNDG-MW04D	Samplers:	Aaron Sutton								
Purge Start Date:	07/12/2019	Time:	12:50	Purge End Date:	07/12/2019	Time:	13:20				
Weather:	Wind:	4 mph, W	Precipitation:	None	Sky:	Mostly Cloudy	Temperature °F:	78			
Well Labeled:	No	Well Secured:	Yes	Comments:	-						
PID SN:	110-902957	Well Headspace (PID mu):	0	Odor:	none						
Water Level Instrument:	Heron	Serial No.:	16820								
SWL beginning (BTOC):	9.81	WL After pump install (BTOC):	9.81	Max Drawdown (in.):	2.16						
Well Casing (inches):	2	Borehole diameter:	6	Sandpack length (ft.):	7						
Screen Length:	19 - 24	Parameters Measured With:	YSI 10D101382								
Water Column height (ft.):	14.19	Total Purge Volume (gallons):	1.5	Purge Method:	Low Flow						
Max Purge Rate mL/min.:	205	Sampling Flow Rate mL/min:	205								
Pump Type:	peristaltic	Pump Vol.:	0	Tubing Material:	HDPE						
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	26	Total Pump + Tubing + Flow Cell Vol.:	0.0504				
Well Casing Vol. (gallons):	3.91	Sandpack Vol. (gal.):	2.35	Total Well Volume (gal.):	6.26						
Depth of pump inlet (BTOC):	21.5	Rationale:	Middle of screen								

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
12:50	0	0	9.95	12.2	6.24	0.36	-24.8	0.386	-	14.8	No TDS
12:59	9	0.5	9.97	11.8	6.22	0.31	-25.7	0.38	-	9.49	No TDS
13:00	1	0.1	9.98	12.2	6.22	0.24	-28.3	0.377	-	1.97	No TDS
13:05	5	0.3	9.98	12.2	6.23	0.22	-31.3	0.376	-	1.76	No TDS
13:10	5	0.3	9.99	11.6	6.24	0.19	-32.6	0.369	-	0.02	No TDS
13:15	5	0.3	9.99	11.4	6.26	0.19	-35.3	0.37	-	0.02	No TDS
13:20	5	0	9.99	11.5	6.3	0.14	-39	0.373	-	0.02	No TDS

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
13:20	5	0	9.99	11.5	6.3	0.14	-39	0.373	-	0.02	0

Sample Type:	MW	Sample Number:	BRLTNDG-MW04D-02	Sample Equipment:	peristaltic and HDPE
Duplicate:	-			MS/MSD:	MS/MSD--02
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:		Date:	-	By:	-
Discharge Water Dispostion:	dumped on				
Comments:	-			Drum No.:	-
Prepared by:	Aaron Sutton				
Date Prepared:	12-Jul-2019				



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN		AOC:	Downgradient	Date:	07/08/2019		
Well ID:	BRLTNDG-MW04S		Samplers:	Kylah Wyatt							
Purge Start Date:	06/30/2019		Time:	09:42	Purge End Date:	06/30/2019		Time:	10:05		
Weather:	Wind:	5 mph, N	Precipitation:	None		Sky:	Sunny		Temperature °F:	75	
Well Labeled:	No		Well Secured:	Yes		Comments:	-				
PID SN:	110-014589			Well Headspace (PID mu):		0			Odor:	none	
Water Level Instrument:	Solinst					Serial No.:	16820				
SWL beginning (BTOC):	3.57			WL After pump install (BTOC):		3.57			Max Drawdown (in.):	7.2	
Well Casing (inches):	2			Borehole diameter:		6			Sandpack length (ft.):	11	
Screen Length:	5.11 - 15.11			Parameters Measured With:		YSI 18h100703					
Water Column height (ft.):	11.54		Total Purge Volume (gallons):		1.1		Purge Method:		Low Flow		
Max Purge Rate mL/min.:			200	Sampling Flow Rate mL/min:		150					
Pump Type:	peristaltic		Pump Vol.:	0			Tubing Material:		HDPE		
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	15	Total Pump + Tubing + Flow Cell Vol.:			0.0502		
Well Casing Vol. (gallons):	2.46			Sandpack Vol. (gal.):	4.35	Total Well Volume (gal.):			6.81		
Depth of pump inlet (BTOC):	10			Rationale:		10 ft screen. Midscreen.					

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
09:42	0	0	-	-	-	-	-	-	-	-	Pump on
09:47	5	0.3	3.8	12.1	6.81	0.62	-67.1	2.46	-	15.6	-
09:50	3	0.2	4.02	12.2	6.82	0.54	-76	2.45	-	15.1	-
09:54	4	0.2	4.12	13.4	6.8	0.43	-83.7	2.47	-	14.2	-
09:57	3	0.1	4.15	13.7	6.79	0.43	-89.3	2.51	-	31.1	-
10:00	3	0.1	4.15	13.6	6.81	0.38	-92.1	2.51	-	29.5	-
10:05	5	0.2	4.17	13.6	6.67	0.38	-94.4	2.51	-	30.7	-

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
10:05	5	1.1	4.17	13.6	6.67	0.38	-	2.51	-	30.7	0

Sample Type:	MW	Sample Number:	BRLTNDG-MW04S-01	Sample Equipment:	peristaltic and HDPE
Duplicate:	-			MS/MSD:	BRLTNDG-MW04S-01
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:		Date:	-	By:	-
Discharge Water Dispostion:	dumped on				
Comments:	Dedicated equipment			Drum No.:	-
Prepared by:	Kylah Wyatt				
Date Prepared:	08-Jul-2019				



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN	AOC:	Downgradient	Date:	07/12/2019			
Well ID:	BRLTNDG-MW04S		Samplers:	Aaron Sutton							
Purge Start Date:	07/12/2019		Time:	14:12	Purge End Date:	07/12/2019	Time:	15:26			
Weather:	Wind:	5 mph, SE	Precipitation:	None	Sky:	Mostly Cloudy	Temperature °F:	77			
Well Labeled:	No		Well Secured:	Yes	Comments:	-					
PID SN:	110-902957		Well Headspace (PID mu):		0		Odor:	none			
Water Level Instrument:	Heron				Serial No.:	16820					
SWL beginning (BTOC):	3.64		WL After pump install (BTOC):		3.64		Max Drawdown (in.):	36.48			
Well Casing (inches):	2		Borehole diameter:		6		Sandpack length (ft.):	11			
Screen Length:	5 - 15		Parameters Measured With:		YSI 10D101832						
Water Column height (ft.):	11.36		Total Purge Volume (gallons):		3.3		Purge Method:	Low Flow			
Max Purge Rate mL/min.:	225		Sampling Flow Rate mL/min:		225						
Pump Type:	peristaltic		Pump Vol.:	0			Tubing Material:	HDPE			
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	17	Total Pump + Tubing + Flow Cell Vol.:		0.0503			
Well Casing Vol. (gallons):	2.45		Sandpack Vol. (gal.):		4.31	Total Well Volume (gal.):		6.76			
Depth of pump inlet (BTOC):	10		Rationale:		Middle of screen						

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
14:12	0	0	3.89	13.7	6.68	0.56	-39.7	1.99	-	12.4	No TDS
14:19	7	0.4	4.38	14.1	6.7	0.37	-77.2	1.96	-	16.5	No TDS
14:24	5	0.3	4.47	14.8	6.74	0.41	-78.8	1.79	-	56.4	No TDS
14:29	5	0.3	4.66	15.2	6.68	0.58	-76.6	1.7	-	71.2	No TDS
14:34	5	0.3	4.72	15.3	6.71	0.41	-78.4	1.76	-	59.3	No TDS
14:39	5	0.2	4.79	15.5	6.72	0.3	-81.6	1.84	-	50.7	No TDS
14:44	5	0.2	5.01	15.5	6.73	0.23	-85.7	1.9	-	36.3	No TDS
14:49	5	0.2	5.07	15.3	6.71	0.19	-88.8	1.91	-	32.3	No TDS
14:54	5	0.2	5.1	15.3	6.74	0.18	-92.3	1.99	-	27.4	No TDS
14:59	5	0.2	5.14	15.2	6.73	0.14	-96.3	2.04	-	20.5	No TDS
15:04	5	0.2	5.17	15.5	6.7	0.14	-98.6	2.07	-	22	No TDS
15:09	5	0.2	6.68	15.6	6.71	0.14	-101.4	2.13	-	21	No TDS

Low-Flow Groundwater Purge And Sample Log

15:14	5	0.2	5.23	15.5	6.7	0.13	-104	2.16	-	20.1	No TDS
15:17	3	0.1	5.25	15.1	6.69	0.14	-105	2.16	-	17	No TDS
15:20	3	0.1	5.26	15.3	6.69	0.14	-106	2.16	-	20.1	No TDS
15:23	3	0.1	5.29	15.1	6.69	0.13	-107.2	2.16	-	19.8	No TDS
15:26	3	0.1	5.3	15	6.7	0.13	-108	2.16	-	20.8	No TDS

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
15:26	3	0.1	5.3	15	6.7	0.13	-108	2.16	-	20.8	0

Sample Type:	MW	Sample Number:	BRLTNDG-MW04S-02	Sample Equipment:	peristaltic and HDPE
Duplicate:	-			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:		Date:	-	By:	-
Discharge Water Dispostion:	dumped on				
Comments:	-			Drum No.:	-
Prepared by:	Aaron Sutton				
Date Prepared:	17-Jul-2019				



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN		AOC:	Downgradient	Date:	07/12/2019		
Well ID:	BRLTNDG-MW05D		Samplers:	Jessica click							
Purge Start Date:	07/12/2019		Time:	09:38	Purge End Date:	07/12/2019		Time:	10:47		
Weather:	Wind:	1 mph, N	Precipitation:	None		Sky:	Partly Cloudy	Temperature °F:	80		
Well Labeled:	Yes		Well Secured:	Yes		Comments:	-				
PID SN:	592-919025		Well Headspace (PID mu):			0		Odor:	none		
Water Level Instrument:	Solinst					Serial No.:	251927				
SWL beginning (BTOC):	22.42		WL After pump install (BTOC):			22.42		Max Drawdown (in.):	57.96		
Well Casing (inches):	2		Borehole diameter:			6		Sandpack length (ft.):	12		
Screen Length:	25.63 - 35.63		Parameters Measured With:			YSI 17m100413					
Water Column height (ft.):	13.21		Total Purge Volume (gallons):			2		Purge Method:	Low Flow		
Max Purge Rate mL/min.:			100		Sampling Flow Rate mL/min:			100			
Pump Type:	peristaltic		Pump Vol.:		0			Tubing Material:	HDPE		
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	39.63	Total Pump + Tubing + Flow Cell Vol.:			0.0506		
Well Casing Vol. (gallons):	5.81		Sandpack Vol. (gal.):		4.56	Total Well Volume (gal.):			10.37		
Depth of pump inlet (BTOC):	32.5		Rationale:		10 ft screen. Midscreen.						

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
09:38	0	0	-	-	-	-	-	-	-	-	Pump on
09:42	4	0.1	22.83	34.3	6.99	60.04	497.4	0.001	-	41.4	-
09:46	4	0	23.28	18.1	7.66	1.77	31.7	0.291	-	48.4	-
09:57	11	0.3	24.12	16.5	7.8	1.1	42.6	0.286	-	55.7	Tubing popped off Peri pump. Reconnected tubing and restarted pump.
10:00	3	0.1	24.36	16.8	7.81	0.78	37.5	0.287	-	44.9	-
10:03	3	0.1	24.6	16.6	7.83	0.73	35.8	0.287	-	47.3	-

Low-Flow Groundwater Purge And Sample Log

10:06	3	0.1	24.92	16.3	7.85	0.67	34.3	0.283	-	45.4	-
10:09	3	0.1	25.26	16.2	7.86	0.6	32.5	0.284	-	47.3	-
10:12	3	0.1	25.55	16.1	7.88	0.63	31.7	0.284	-	40.9	-
10:15	3	0.1	25.69	15.9	7.89	0.72	30.8	0.283	-	39.9	-
10:18	3	0.1	25.9	15.8	7.88	1.01	31.2	0.285	-	40	-
10:21	3	0.1	26.02	16.4	7.89	1.32	32	0.289	-	53.4	-
10:24	3	0.1	26.17	16.2	7.9	1.33	32.1	0.289	-	72.9	-
10:27	3	0.1	26.31	16.3	7.91	1.64	33.2	0.291	-	96.4	-
10:30	3	0.1	26.45	16.4	7.92	1.88	33.2	0.29	-	88.5	-
10:33	3	0.1	26.6	16.2	7.94	2.23	33.4	0.289	-	98.5	-
10:36	3	0.1	26.75	16.1	7.93	2.31	33.7	0.289	-	105	-
10:39	3	0.1	26.91	16.3	7.96	2.5	34.9	0.287	-	125	-
10:42	3	0.1	27.05	16.5	7.93	2.38	35	0.289	-	131	-
10:44	2	0.1	27.16	16.5	7.94	2.42	35	0.289	-	133	-
10:47	3	0	27.25	16.3	7.95	2.33	35.1	0.289	-	127	Sample time

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
10:47	3	0	27.25	16.3	7.95	2.33	35.1	0.289	-	127	0

Sample Type:	MW	Sample Number:	BRLTNDG-MW05D-01	Sample Equipment:	peristaltic and HDPE
Duplicate:	-			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:		Date:	-	By:	-
Discharge Water Dispostion:	dumped on				
Comments:	Dedicated equipment			Drum No.:	-
Prepared by:	Other	JLC			
Date Prepared:	12-Jul-2019				

Low-Flow Groundwater Purge And Sample Log

Project No.:	30001	Site:	BRLTN	AOC:	Downgradient	Date:	07/14/2019				
Well ID:	BRLTNDG-MW05D	Samplers:	Aaron Sutton, Jessica click								
Purge Start Date:	07/14/2019	Time:	12:52	Purge End Date:	07/14/2019	Time:	13:55				
Weather:	Wind:	2 mph, N	Precipitation:	None	Sky:	Partly Cloudy	Temperature °F:	78			
Well Labeled:	Yes	Well Secured:	Yes	Comments:	-						
PID SN:	110-014589	Well Headspace (PID mu):	0	Odor:	none						
Water Level Instrument:	Solinst	Serial No.:	306670								
SWL beginning (BTOC):	20.57	WL After pump install (BTOC):	20.57	Max Drawdown (in.):	60.6						
Well Casing (inches):	2	Borehole diameter:	6	Sandpack length (ft.):	12						
Screen Length:	25.6 - 35.6	Parameters Measured With:	YSI 14K100940								
Water Column height (ft.):	15.03	Total Purge Volume (gallons):	2.1	Purge Method:	Low Flow						
Max Purge Rate mL/min.:	140	Sampling Flow Rate mL/min:	140								
Pump Type:	peristaltic	Pump Vol.:	0	Tubing Material:	HDPE						
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	37	Total Pump + Tubing + Flow Cell Vol.:	0.0506				
Well Casing Vol. (gallons):	5.81	Sandpack Vol. (gal.):	4.54	Total Well Volume (gal.):	10.35						
Depth of pump inlet (BTOC):	30	Rationale:	Middle of well screen								

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
12:52	0	0	-	-	-	-	-	-	-	-	Pump on
12:55	3	0.1	21.08	14.3	8.56	3.36	137.6	0.321	-	1000	-
12:58	3	0.1	21.37	14.9	8.02	0.79	151	0.322	-	1000	-
13:01	3	0.1	21.7	15.4	7.9	0.6	153.6	0.325	-	1000	-
13:04	3	0.1	21.99	15	7.76	0.56	156.3	0.327	-	218	-
13:07	3	0.1	22.26	14.6	7.77	0.53	153	0.323	-	97.3	-
13:10	3	0.1	22.53	15	7.73	0.51	151.9	0.324	-	87.2	-
13:13	3	0.1	22.77	14.97	7.77	0.54	147.7	0.323	-	79.9	-
13:16	3	0.1	23	14.9	7.8	0.53	144.8	0.323	-	79.6	Water level not stable yet.
13:19	3	0.1	23.28	15.4	7.82	0.54	141.8	0.326	-	83.5	-
13:22	3	0.1	23.49	15.1	7.85	0.58	139.1	0.325	-	84.5	-

Low-Flow Groundwater Purge And Sample Log

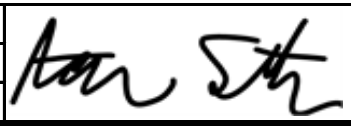
13:25	3	0.1	23.76	15	7.85	0.58	138	0.325	-	84.8	Water level not stable yet
13:28	3	0.1	23.95	14.9	7.85	0.6	138	0.324	-	86.1	Water level not stable yet.
13:31	3	0.1	24.18	15	7.85	0.67	136	0.326	-	82.1	-
13:34	3	0.1	24.4	14.8	7.85	0.73	135.2	0.325	-	84.8	-
13:37	3	0.1	24.59	14.8	7.85	0.81	135	0.327	-	86.5	-
13:40	3	0.1	24.79	14.8	7.85	0.94	134.3	0.327	-	81.4	-
13:43	3	0.1	25.01	14.7	7.84	0.96	133.9	0.327	-	83.4	-
13:46	3	0.1	25.21	14.9	7.84	0.94	133.2	0.329	-	81.7	Water level not stable yet.
13:49	3	0.1	25.41	15.1	7.84	0.96	132.5	0.33	-	81.6	Water level not stable yet.
13:52	3	0.1	25.57	15	7.85	0.99	131.5	0.332	-	74.9	Water level not stable yet.
13:55	3	0.1	25.62	15.1	7.85	1.05	130.7	0.333	-	77.7	Pump off 1427

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
13:55	3	0.1	25.62	15.1	7.85	1.05	130.7	0.333	-	77.7	0

Sample Type:	MW	Sample Number:	BRLTNDG-MW05D-02	Sample Equipment:	peristaltic and HDPE
Duplicate:	-			MS/MSD:	MS/MSD--02
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:		Date:	-	By:	-
Discharge Water Dispostion:	dumped on				
Comments:	-			Drum No.:	-
Prepared by:	Aaron Sutton				
Date Prepared:	14-Jul-2019				



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN		AOC:	Downgradient	Date:	07/09/2019		
Well ID:	BRLTNDG-MW05S		Samplers:	Aaron Sutton							
Purge Start Date:	07/09/2019		Time:	16:31	Purge End Date:	07/09/2019		Time:	17:57		
Weather:	Wind:	1 mph, SW	Precipitation:	None		Sky:	Partly Cloudy		Temperature °F:	86	
Well Labeled:	No		Well Secured:	Yes		Comments:	-				
PID SN:	-		Well Headspace (PID mu):			0			Odor:	none	
Water Level Instrument:	Solinst					Serial No.:	288002				
SWL beginning (BTOC):	15.13		WL After pump install (BTOC):			15.13			Max Drawdown (in.):	0.2	
Well Casing (inches):	2				Borehole diameter:	6			Sandpack length (ft.):	12.5	
Screen Length:	6.66 - 16.66				Parameters Measured With:		YSI 14K100940				
Water Column height (ft.):	1.53		Total Purge Volume (gallons):		5.4		Purge Method:		Low Flow		
Max Purge Rate mL/min.:			230		Sampling Flow Rate mL/min:		230				
Pump Type:	peristaltic		Pump Vol.:		0		Tubing Material:		HDPE		
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	17	Total Pump + Tubing + Flow Cell Vol.:			3.32		
Well Casing Vol. (gallons):	2.72		Sandpack Vol. (gal.):		0.6	Total Well Volume (gal.):			0.17		
Depth of pump inlet (BTOC):	16.16		Rationale:		Water column only 1.5 ft. Set intake at bottom third of water column.						

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
16:31	0	0	15.14	12.3	7.18	7.02	48.8	0.72	-	132	No TDS
16:36	5	0.3	15.14	11.9	6.9	6.14	34.8	0.71	-	30.9	No TDS
16:41	5	0.3	15.14	11.8	6.89	6.14	30.1	0.71	-	8.37	No TDS
16:46	5	0.3	15.14	11.7	6.9	6.42	29.9	0.71	-	5.29	No TDS
16:51	5	0.3	15.15	11.5	6.81	6.35	34.5	0.7	-	5.44	No TDS
16:56	5	0.3	15.15	11.6	6.81	6.19	36.4	0.7	-	4.71	No TDS
17:01	5	0.3	15.15	11.5	6.82	5.89	39.7	0.7	-	3.51	No TDS
17:06	5	0.3	15.15	11.6	6.77	5.34	42.9	0.71	-	4.84	No TDS
17:11	5	0.3	15.15	11.6	6.82	4.77	46.7	0.71	-	3.3	No TDS
17:16	5	0.3	15.15	11.6	6.76	4.11	49.3	0.71	-	3.48	No TDS
17:21	5	0.3	15.15	11.4	6.74	3.61	50.3	0.7	-	2.33	No TDS
17:24	3	0.2	15.15	11.3	6.75	3.26	51.1	0.71	-	2.6	No TDS

Low-Flow Groundwater Purge And Sample Log

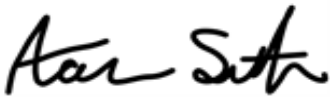
17:27	3	0.2	15.15	11.5	6.75	3.03	51.7	0.71	-	1.75	No TDS
17:30	3	0.2	15.15	11.5	6.75	2.74	53.2	0.7	-	2.33	No TDS
17:33	3	0.2	15.15	11.6	6.8	2.46	54.9	0.7	-	1.78	No TDS
17:36	3	0.2	15.15	11.4	6.78	2.19	56.8	0.7	-	1.53	No TDS
17:39	3	0.2	15.15	11.5	6.78	2.07	56.1	0.7	-	1.83	No TDS
17:42	3	0.2	15.15	11.6	6.79	1.9	56.9	0.7	-	1.72	No TDS
17:45	3	0.2	15.15	11.6	6.79	1.74	58.2	0.7	-	1.9	No TDS
17:48	3	0.2	15.15	11.5	6.78	1.64	60.4	0.7	-	1.71	No TDS
17:51	3	0.2	15.16	11.6	6.76	1.5	61.3	0.7	-	1.64	No TDS
17:54	3	0.2	15.16	11.5	6.8	1.42	61.5	0.69	-	1.22	No TDS
17:57	3	0.2	15.16	11.5	6.77	1.36	62.3	0.69	-	1.43	No TDS

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
17:57	3	0.2	15.16	11.5	6.77	1.36	62.3	0.69	0	1.43	0

Sample Type:	MW	Sample Number:	BRLTNDG-MW05S-01	Sample Equipment:	peristaltic and HDPE
Duplicate:	-			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:		Date:	-	By:	-
Discharge Water Dispostion:	dumped on				
Comments:	-			Drum No.:	-
Prepared by:	Aaron Sutton				
Date Prepared:	17-Jul-2019				



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN		AOC:	Downgradient	Date:	07/13/2019		
Well ID:	BRLTNDG-MW05S		Samplers:	Jessica click							
Purge Start Date:	07/13/2019		Time:	10:30	Purge End Date:	07/13/2019		Time:	11:05		
Weather:	Wind:	3 mph, W	Precipitation:	None		Sky:	Sunny	Temperature °F:	85		
Well Labeled:	Yes		Well Secured:	Yes		Comments:	-				
PID SN:	110-014589		Well Headspace (PID mu):	0				Odor:	none		
Water Level Instrument:	Solinst					Serial No.:	251927				
SWL beginning (BTOC):	15.16		WL After pump install (BTOC):	15.16				Max Drawdown (in.):	0.24		
Well Casing (inches):	2				Borehole diameter:	6		Sandpack length (ft.):	12.5		
Screen Length:	6.66 - 16.67				Parameters Measured With:	YSI 14K100940					
Water Column height (ft.):	1.51		Total Purge Volume (gallons):	1				Purge Method:	Low Flow		
Max Purge Rate mL/min.:			100		Sampling Flow Rate mL/min:	100					
Pump Type:	peristaltic		Pump Vol.:	0				Tubing Material:	HDPE		
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	20.67	Total Pump + Tubing + Flow Cell Vol.:			0.0503		
Well Casing Vol. (gallons):	2.72		Sandpack Vol. (gal.):	0.59		Total Well Volume (gal.):			3.31		
Depth of pump inlet (BTOC):	16		Rationale:	Midway between water level and bottom of screen.							

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
10:30	0	0	-	-	-	-	-	-	-	-	Pump on
10:35	5	0	15.18	15.7	6.74	4.76	176.3	0.8	-	9.95	-
10:38	3	0.1	15.18	14.9	6.73	4.97	180.4	0.79	-	6.29	-
10:41	3	0.1	15.18	14.5	6.75	5.33	183	0.77	-	5.17	-
10:44	3	0.1	15.18	14.3	6.74	5.2	184.4	0.77	-	8.21	-
10:47	3	0.1	15.18	14.4	6.75	5.36	183.2	0.77	-	14.6	-
10:50	3	0.1	15.18	14.5	6.76	5.5	182.1	0.77	-	18.9	-
10:53	3	0.1	15.18	14.2	6.79	5.61	178.4	0.77	-	7.98	-
10:56	3	0.1	15.18	14.2	6.79	5.39	175.8	0.76	-	4.56	-
10:59	3	0.1	15.18	14	6.81	5.36	171.9	0.76	-	6.77	-
11:02	3	0.1	15.18	14.1	6.8	5.43	169.3	0.76	-	6.3	-
11:05	3	0.1	15.18	13.9	6.82	4.91	166.1	0.76	-	6.13	Sample time

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
11:05	3	0.1	15.18	13.9	6.82	4.91	166.1	0.76	-	6.13	0

Sample Type:	MW	Sample Number:	BRLTNDG-MW05S-02	Sample Equipment:	peristaltic and HDPE
Duplicate:	-			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:		Date:	-	By:	-
Discharge Water Dispostion:	dumped on				
Comments:	Dedicated equipment			Drum No.:	-
Prepared by:	Other	JLC			
Date Prepared:	13-Jul-2019				

Low-Flow Groundwater Purge And Sample Log

Project No.:	30001	Site:	BRLTN	AOC:	Upgradient	Date:	07/10/2019				
Well ID:	BRLTNUP-MW01D	Samplers:	Aaron Sutton								
Purge Start Date:	07/10/2019	Time:	08:30	Purge End Date:	07/10/2019	Time:	09:27				
Weather:	Wind:	0 mph, S	Precipitation:	None	Sky:	Partly Cloudy	Temperature °F:	69			
Well Labeled:	No	Well Secured:	Yes	Comments:	-						
PID SN:	592-919025	Well Headspace (PID mu):	0	Odor:	none						
Water Level Instrument:	Solinst	Serial No.:	251927								
SWL beginning (BTOC):	10.68	WL After pump install (BTOC):	10.68	Max Drawdown (in.):	15.84						
Well Casing (inches):	2	Borehole diameter:	6	Sandpack length (ft.):	13						
Screen Length:	48 - 58	Parameters Measured With:	YSI 16J101780								
Water Column height (ft.):	47.32	Total Purge Volume (gallons):	3.6	Purge Method:	Low Flow						
Max Purge Rate mL/min.:	255	Sampling Flow Rate mL/min:	255								
Pump Type:	peristaltic	Pump Vol.:	0	Tubing Material:	HDPE						
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	58.5	Total Pump + Tubing + Flow Cell Vol.:	0.051				
Well Casing Vol. (gallons):	9.46	Sandpack Vol. (gal.):	5.09	Total Well Volume (gal.):	14.55						
Depth of pump inlet (BTOC):	53	Rationale:	Middle of 10' screen								

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
08:30	0	0	11.28	12.7	7.58	1.5	-33.3	0.375	-	40.9	No TDS
08:35	5	0.3	11.68	12.6	7.9	0.58	-97.3	0.373	-	43.1	No TDS
08:40	5	0.3	11.84	12.5	7.98	0.37	-118.9	0.38	-	61.7	No TDS
08:45	5	0.3	11.91	12.6	7.95	0.29	-118.4	0.385	-	58	No TDS
08:50	5	0.3	11.95	12.6	7.8	0.27	-109.7	0.39	-	39.8	No TDS
08:55	5	0.3	11.97	12.6	7.79	0.29	-116.5	0.387	-	26	No TDS
09:00	5	0.3	11.97	12.7	7.78	0.3	-125.7	0.386	-	51.7	No TDS
09:06	6	0.4	11.97	12.8	7.86	0.3	-132.7	0.385	-	49.8	No TDS
09:10	4	0.3	11.97	12.9	7.87	0.29	-137.4	0.386	-	26.8	No TDS
09:15	5	0.3	11.98	12.9	7.89	0.27	-144.9	0.386	-	24.6	No TDS
09:18	3	0.2	11.99	12.9	7.88	0.24	-147.5	0.387	-	22.4	No TDS
09:21	3	0.2	11.99	13	7.9	0.22	-151.1	0.386	-	17.1	No TDS
09:24	3	0.2	11.99	12.9	7.92	0.21	-153.6	0.387	-	16.9	No TDS

Low-Flow Groundwater Purge And Sample Log

09:27	3	0.2	12	13	7.94	0.2	-156.8	0.387	-	18.1	No TDS

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
09:27	3	3.6	12	13	7.94	0.2	-156.8	0.387	-	18.1	0

Sample Type:	MW	Sample Number:	BRLTNUP-MW01D-01		Sample Equipment:	peristaltic and HDPE	
Duplicate:	-				MS/MSD:	-	
Sample Filtered:	No	Filter Type/Size:	-		Equipment Rinsate Sample No.:	-	
Sample Equipment Decon:		Date:	-	By:	-	Discharge Water Dispostion:	55-gallon
Comments:	-					Drum No.:	-
Prepared by:	Aaron Sutton						
Date Prepared:	10-Jul-2019						

Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN		AOC:	Upgradient	Date:	07/13/2019		
Well ID:	BRLTNUP-MW01D		Samplers:	Aaron Sutton							
Purge Start Date:	07/13/2019		Time:	10:25	Purge End Date:		07/13/2019	Time:	11:39		
Weather:	Wind:	5 mph, NE	Precipitation:	None		Sky:	Sunny		Temperature °F:	75	
Well Labeled:	No		Well Secured:	Yes		Comments:	Name on j plug				
PID SN:	-		Well Headspace (PID mu):			-			Odor:	none	
Water Level Instrument:	Heron					Serial No.:	16820				
SWL beginning (BTOC):	10.72		WL After pump install (BTOC):			10.72			Max Drawdown (in.):	140.5	
Well Casing (inches):	2				Borehole diameter:	6			Sandpack length (ft.):	13	
Screen Length:	48 - 58				Parameters Measured With:		YSI 16J101780				
Water Column height (ft.):	47.28		Total Purge Volume (gallons):		3		Purge Method:		Low Flow		
Max Purge Rate mL/min.:			160		Sampling Flow Rate mL/min:		160				
Pump Type:	peristaltic		Pump Vol.:		0		Tubing Material:		HDPE		
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	58	Total Pump + Tubing + Flow Cell Vol.:			0.0509		
Well Casing Vol. (gallons):	9.46		Sandpack Vol. (gal.):		5.09	Total Well Volume (gal.):			14.55		
Depth of pump inlet (BTOC):	51.88		Rationale:		Middle of screen						

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
10:25	0	0	-	-	-	-	-	-	-	-	Pump on
10:29	4	0.2	11.21	14.6	7.51	5.98	-25.7	0.399	-	90.4	No TDS
10:34	5	0.2	11.44	14.4	7.74	2.82	-96	0.396	-	58.7	No TDS
10:39	5	0.2	11.52	14.1	7.83	1.35	-122.8	0.393	-	49.1	No TDS
10:44	5	0.2	11.58	14.4	7.88	0.52	-139.5	0.393	-	13.1	No TDS
10:49	5	0.2	11.62	13.7	7.87	0.33	-139.9	0.39	-	7.46	No TDS
10:54	5	0.2	11.62	13.7	7.8	0.29	-138.9	0.393	-	4.75	No TDS
10:59	5	0.2	11.63	14.3	7.74	0.25	-139.2	0.399	-	6.04	No TDS
11:04	5	0.2	11.64	13.5	7.73	0.22	-142.6	0.394	-	5.14	No TDS
11:09	5	0.2	11.65	13.8	7.73	0.2	-147.7	0.398	-	6.33	No TDS
11:14	5	0.2	11.66	13.6	7.73	0.19	-150.8	0.396	-	3.41	No TDS
11:19	5	0.2	11.67	13.8	7.75	0.16	-153.4	0.399	-	3.12	No TDS

Low-Flow Groundwater Purge And Sample Log

11:24	5	0.2	11.67	14.4	7.73	0.13	-158.2	0.406	-	2.76	No TDS
11:29	5	0.2	11.69	13.9	7.77	0.13	-161.4	0.401	-	3.42	No TDS
11:34	5	0.2	11.7	14.1	7.77	0.13	-164.9	0.406	-	3.23	No TDS
11:39	5	0.2	11.71	13.7	7.81	0.13	-167.1	0.4	-	3.1	No TDS

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
11:39	5	0.2	11.71	13.7	7.81	0.13		0.4	-	3.1	0

Sample Type:	MW	Sample Number:	BRLTNUP-MW01D-02		Sample Equipment:	peristaltic and HDPE	
Duplicate:	-				MS/MSD:	-	
Sample Filtered:	No	Filter Type/Size:	-		Equipment Rinsate Sample No.:	-	
Sample Equipment Decon:		Date:	-	By:	-	Discharge Water Dispostion:	dumped on
Comments:	-					Drum No.:	-
Prepared by:	Aaron Sutton						
Date Prepared:	13-Jul-2019						



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN		AOC:	4	Date:	06/11/2019		
Well ID:	BTV-MW-5		Samplers:	Aaron Sutton							
Purge Start Date:	06/11/2019		Time:	14:08	Purge End Date:		06/11/2019	Time:	16:05		
Weather:	Wind:	9 mph, E	Precipitation:	None		Sky:	Mostly Cloudy	Temperature °F:	70		
Well Labeled:	No		Well Secured:	Yes		Comments:	-				
PID SN:	-			Well Headspace (PID mu):			-	Odor:	none		
Water Level Instrument:		Solinst					Serial No.:	288002			
SWL beginning (BTOC):		10.21		WL After pump install (BTOC):			10.21	Max Drawdown (in.):	1.92		
Well Casing (inches):		2			Borehole diameter:		Unknown	Sandpack length (ft.):	Unknown		
Screen Length:	9.2 - 14.2				Parameters Measured With:		YSI 14K100940				
Water Column height (ft.):		3.99	Total Purge Volume (gallons):			4.4	Purge Method:		Low Flow		
Max Purge Rate mL/min.:			160		Sampling Flow Rate mL/min:		150				
Pump Type:	peristaltic		Pump Vol.:		0		Tubing Material:		HDPE		
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	16.2	Total Pump + Tubing + Flow Cell Vol.:			0.0502		
Well Casing Vol. (gallons):		2.32		Sandpack Vol. (gal.):	Unknown	Total Well Volume (gal.):			Unknown		
Depth of pump inlet (BTOC):		11.7		Rationale:	Middle of screen						

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
14:08	0	0	10.29	12.7	7.6	11.57	211.5	0.05	-	76.3	No TDS
14:13	5	0.1	10.31	12.3	6	9.34	292.2	0.045	-	114	No TDS
14:18	5	0.1	10.31	12.2	5.72	9.07	320.8	0.044	-	99	No TDS
14:23	5	0.1	10.33	11.9	5.86	9.03	323.1	0.043	-	102	No TDS
14:29	6	0.2	10.33	12	5.97	9.14	326.1	0.046	-	79.6	No TDS
14:33	4	0.2	10.35	11.7	5.93	9.16	332.2	0.046	-	62.4	No TDS
14:38	5	0.2	10.36	12.1	5.99	9.05	332.3	0.046	-	57.2	No TDS
14:43	5	0.2	10.36	12.2	6.03	9.08	334.8	0.045	-	45.6	No TDS
14:48	5	0.2	10.36	12.9	6.05	9.06	332.3	0.046	-	41.5	No TDS
14:53	5	0.2	10.36	12.8	6.09	8.92	333	0.046	-	41.3	No TDS
14:58	5	0.2	10.36	12.8	6.1	8.83	333.2	0.047	-	31.9	No TDS
15:03	5	0.2	10.36	12.9	6.16	8.79	334.1	0.047	-	32.3	No TDS
15:08	5	0.2	10.36	12.7	6.12	8.53	336.1	0.047	-	28.3	No TDS
15:13	5	0.2	10.36	13.1	6.11	8.67	336.2	0.046	-	23.1	No TDS

Low-Flow Groundwater Purge And Sample Log

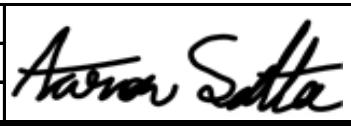
15:18	5	0.2	10.37	12.2	6.09	8.66	340.4	0.045	-	20.4	No TDS
15:23	5	0.2	10.37	12.9	6.05	8.42	342.2	0.047	-	17.8	No TDS
15:28	5	0.2	10.7	12.6	6.12	8.51	341.4	0.046	-	26.4	No TDS
15:33	5	0.2	10.37	12.9	6.08	8.49	342.6	0.047	-	15.5	No TDS
15:38	5	0.2	10.37	13	6.08	8.51	343.7	0.046	-	16.8	No TDS
15:43	5	0.2	10.37	12.7	6.15	8.6	345.7	0.046	-	15.7	No TDS

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
15:43	5	0.2	10.37	12.7	6.15	8.6	345.7	0.046	-	15.7	No TDS

Sample Type:	Existing MW	Sample Number:	BTV-MW-5-01	Sample Equipment:	peristaltic and HDPE
Duplicate:	BTV-MW-5-91			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:		Date:	-	By:	-
Discharge Water Dispostion:	55-gallon				
Comments:	-			Drum No.:	-
Prepared by:	Aaron Sutton				
Date Prepared:	11-Jun-2019				



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN		AOC:	4	Date:	06/29/2019		
Well ID:	BTV-MW-5		Samplers:	Dan Chamberland, Kylah Wyatt							
Purge Start Date:	06/29/2019		Time:	12:09	Purge End Date:		06/29/2019	Time:	12:39		
Weather:	Wind:	5 mph, N	Precipitation:	None		Sky:	Mostly Cloudy	Temperature °F:	78		
Well Labeled:	Yes		Well Secured:	Yes		Comments:	-				
PID SN:	592919025			Well Headspace (PID mu):		0		Odor:	none		
Water Level Instrument:	Solinst					Serial No.:	251927				
SWL beginning (BTOC):	10.18			WL After pump install (BTOC):		10.18		Max Drawdown (in.):	3		
Well Casing (inches):	2			Borehole diameter:		Unknown		Sandpack length (ft.):	Unknown		
Screen Length:	9.2 - 14.2			Parameters Measured With:		YSI 12l100463					
Water Column height (ft.):	4.02		Total Purge Volume (gallons):	1.2		Purge Method:	Low Flow				
Max Purge Rate mL/min.:	152		Sampling Flow Rate mL/min:	152							
Pump Type:	peristaltic		Pump Vol.:	0		Tubing Material:	HDPE				
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	22	Total Pump + Tubing + Flow Cell Vol.:	0.0504				
Well Casing Vol. (gallons):	2.32		Sandpack Vol. (gal.):	Unknown		Total Well Volume (gal.):	Unknown				
Depth of pump inlet (BTOC):	12		Rationale:	No construction info. Assume 5 ft screen. 14.2 ft total depth							

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
12:09	0	0	-	-	-	-	-	-	-	-	-
12:15	6	0.2	10.31	8	7.78	14.49	72.7	0.07	-	35.7	-
12:18	3	0.1	10.33	7.5	6.48	13.29	-1.2	0.068	-	30.5	-
12:23	5	0.2	10.34	7.4	6.04	15.04	159.7	0.066	-	29.4	-
12:27	4	0.2	10.37	7.1	5.89	14.23	165.8	0.068	-	17.9	-
12:31	4	0.2	10.4	6.9	5.87	13.82	169.1	0.069	-	14.6	-
12:34	3	0.1	10.41	6.9	5.85	14.42	170.9	0.069	-	14.5	-
12:39	5	0.2	10.43	6.8	5.85	14.3	172.5	0.069	-	14	Sample

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
12:39	5	1.2	10.43	6.8	5.85	14.3	172.5	0.069	-	14	0

Sample Type:	Existing MW	Sample Number:	BTV-MW-5-02	Sample Equipment:	peristaltic and HDPE
Duplicate:	BTV-MW-5-92			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:	Date:	-	By:	-	Discharge Water Dispostion: dumped on
Comments:	Dedicated/ disposable equipment used. Total purge approx 1.25 gal			Drum No.:	-
Prepared by:	Kylah Wyatt				
Date Prepared:	29-Jun-2019				

Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN		AOC:	5	Date:	06/12/2019		
Well ID:	BTV-MW-9		Samplers:	Aaron Sutton							
Purge Start Date:	06/12/2019		Time:	11:50	Purge End Date:	06/12/2019		Time:	13:01		
Weather:	Wind:	6 mph, E	Precipitation:	None		Sky:	Sunny		Temperature °F:	75	
Well Labeled:	No		Well Secured:	Yes		Comments:	Standing water in well				
PID SN:	-			Well Headspace (PID mu):		-			Odor:	none	
Water Level Instrument:	Heron					Serial No.:	16820				
SWL beginning (BTOC):	20.59			WL After pump install (BTOC):		20.59			Max Drawdown (in.):	7.32	
Well Casing (inches):	2				Borehole diameter:	Unknown			Sandpack length (ft.):	Unknown	
Screen Length:	27.88 - 32.88				Parameters Measured With:		YSI 10D101384				
Water Column height (ft.):	12.29		Total Purge Volume (gallons):		2.8			Purge Method:		Low Flow	
Max Purge Rate mL/min.:			150		Sampling Flow Rate mL/min:		150				
Pump Type:	peristaltic		Pump Vol.:		0			Tubing Material:		HDPE	
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	34.38	Total Pump + Tubing + Flow Cell Vol.:				0.0506	
Well Casing Vol. (gallons):	5.36			Sandpack Vol. (gal.):	Unknown	Total Well Volume (gal.):				Unknown	
Depth of pump inlet (BTOC):	30.38			Rationale:	Middle of screen						

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
11:50	0	0	20.99	9.7	6.26	11.29	174.7	0.361	-	12.8	No TDS
11:55	5	0.2	21.1	9.1	5.65	11.44	203.8	0.357	-	7.74	No TDS
12:00	5	0.2	21.16	9.1	6	11.63	191.9	0.357	-	7.55	No TDS
12:05	5	0.2	21.19	9.3	6.08	11.31	181.7	0.36	-	5.63	No TDS
12:10	5	0.2	21.19	9.3	6.27	11.46	174.8	0.36	-	5.28	No TDS
12:15	5	0.2	21.19	9	6.43	11.55	173.3	0.357	-	3.84	No TDS
12:20	5	0.2	21.2	9	6.33	11.56	171.8	0.358	-	3.33	No TDS
12:25	5	0.2	21.2	9	6.39	11.18	168.6	0.358	-	2.44	No TDS
12:30	5	0.2	21.2	9.3	6.48	10.93	167.5	0.361	-	2.6	No TDS
12:35	5	0.2	21.2	9.1	6.42	11.21	165.8	0.359	-	2.35	No TDS
12:40	5	0.2	21.2	9.4	6.56	11.14	165.1	0.361	-	2.13	No TDS
12:46	6	0.2	21.2	9.4	6.6	10.89	163.8	0.361	-	1.84	No TDS

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
12:46	6	0.2	21.2	9.4	6.6	10.89	163.8	0.361	-	1.84	No TDS

Sample Type:	Existing MW	Sample Number:	BTV-MW-9-01	Sample Equipment:	peristaltic and HDPE
Duplicate:	-			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:	Date:	-	By:	-	Discharge Water Dispostion: 55-gallon
Comments:	Bailer thrown away by mistake. Need to replace			Drum No.:	-
Prepared by:	Aaron Sutton				
Date Prepared:	12-Jun-2019				

Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN	AOC:	5	Date:	7/11/2019			
Well ID:	BTV-MW-9		Samplers:	Aaron Sutton							
Purge Start Date:	7/11/2019		Time:	16:30	Purge End Date:	7/11/2019	Time:	17:36			
Weather:	Wind:	6 mph, W	Precipitation:	None	Sky:	Sunny	Temperature °F:	80			
Well Labeled:	No		Well Secured:	Yes	Comments:	-					
PID SN:	110-014589		Well Headspace (PID mu):		0		Odor:	none			
Water Level Instrument:	Heron				Serial No.:	16820					
SWL beginning (BTOC):	20.8		WL After pump install (BTOC):		20.8		Max Drawdown (in.):	2.5			
Well Casing (inches):	2		Borehole diameter:		6		Sandpack length (ft.):	Unknown			
Screen Length:	Unknown		Parameters Measured With:		YSI 14K100940						
Water Column height (ft.):	12.08		Total Purge Volume (gallons):		2.6		Purge Method:	Low Flow			
Max Purge Rate mL/min.:	150		Sampling Flow Rate mL/min:		150						
Pump Type:	peristaltic		Pump Vol.:	0	Tubing Material:	HDPE					
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	35	Total Pump + Tubing + Flow Cell Vol.:		0.4			
Well Casing Vol. (gallons):	1.97		Sandpack Vol. (gal.):	Unknown	Total Well Volume (gal.):	Unknown					
Depth of pump inlet (BTOC):	30.38		Rationale:	Assumed 5 ft screen. Midscreen.							

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
16:30	0	0	21.23	15.1	7.04	8.52	186	429	-	3.84	No TDS
16:35	5	0.2	21.36	15.5	6.8	8.51	191.3	0.426	-	3.88	No TDS
16:40	5	0.2	21.4	15	6.88	8.27	187.3	0.421	-	1.46	No TDS
16:45	5	0.2	21.42	15	6.87	7.59	187.7	0.417	-	1.46	No TDS
16:50	5	0.2	21.42	14.6	6.84	6.94	188.6	0.405	-	2.35	No TDS
16:55	5	0.2	21.42	14.6	6.81	6.22	193	0.404	-	2.04	No TDS
17:00	5	0.2	21.43	14.9	6.82	5.78	191.5	0.408	-	1.62	No TDS
17:05	5	0.2	21.43	14.6	6.9	5.29	190.4	0.409	-	1.65	No TDS
17:10	5	0.2	21.43	14.9	6.88	4.73	191.5	0.409	-	1.15	No TDS
17:15	5	0.2	21.42	14.9	6.91	4.36	191.3	0.409	-	0.94	No TDS
17:20	5	0.2	21.42	14.7	6.94	3.96	193.1	0.409	-	1.06	No TDS
17:26	6	0.2	21.43	14.7	6.88	3.51	194.1	0.408	-	0.63	No TDS
17:30	4	0.2	21.44	15	6.97	3.2	194.7	0.41	-	0.9	No TDS

Low-Flow Groundwater Purge And Sample Log

17:33	3	0.1	21.44	15	6.96	3.05	195.9	0.411	-	0.91	No TDS
17:36	3	0.1	21.44	14.7	6.98	2.9	196.5	0.408	-	0.77	No TDS

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (^{o}C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
17:36	3	0.1	21.44	14.7	6.98	2.9	196.5	0.408	0	0.77	0

Sample Type:	Existing MW	Sample Number:	BTV-MW-9-02		Sample Equipment:	peristaltic and HDPE	
Duplicate:	-				MS/MSD:	-	
Sample Filtered:	No	Filter Type/Size:	-		Equipment Rinsate Sample No.:	-	
Sample Equipment Decon:		Date:	-	By:	-	Discharge Water Dispostion:	dumped on
Comments:	Dedicated equipment					Drum No.:	-
Prepared by:	Kylah Wyatt						
Date Prepared:	11-Jul-19						

Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN	AOC:	1	Date:	06/12/2019			
Well ID:	BTV-MW-14		Samplers:	Aaron Sutton							
Purge Start Date:	06/12/2019		Time:	09:01	Purge End Date:	06/12/2019	Time:	10:26			
Weather:	Wind:	4 mph, SE	Precipitation:	None	Sky:	Sunny	Temperature °F:	60			
Well Labeled:	Yes		Well Secured:	Yes	Comments:	Label on inside of well					
PID SN:	-		Well Headspace (PID mu):		-		Odor:	none			
Water Level Instrument:	Heron				Serial No.:	16820					
SWL beginning (BTOC):	12.87		WL After pump install (BTOC):		12.87		Max Drawdown (in.):	4.68			
Well Casing (inches):	2		Borehole diameter:		Unknown		Sandpack length (ft.):	Unknown			
Screen Length:	17.97 - 22.97		Parameters Measured With:		YSI 10D101384						
Water Column height (ft.):	10.1		Total Purge Volume (gallons):		4		Purge Method:	Low Flow			
Max Purge Rate mL/min.:	150		Sampling Flow Rate mL/min:		150						
Pump Type:	peristaltic		Pump Vol.:	0	Tubing Material:	HDPE					
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	23.47	Total Pump + Tubing + Flow Cell Vol.:		0.0504			
Well Casing Vol. (gallons):	3.75		Sandpack Vol. (gal.):		Unknown	Total Well Volume (gal.):		Unknown			
Depth of pump inlet (BTOC):	20.47		Rationale:		Middle of screen						

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
09:01	0	0	13.2	6.3	7.32	14.09	156.8	0.129	-	4.82	No TDS
09:06	5	0.2	13.22	6.1	6.04	13.97	197	0.127	-	5.32	No TDS
09:11	5	0.2	13.24	6	5.92	14.12	205.1	0.127	-	5.91	No TDS
09:16	5	0.2	13.24	5.9	5.99	13.9	204.4	0.131	-	5.04	No TDS
09:21	5	0.2	13.24	6.1	6.06	13.77	202.4	0.126	-	3.81	No TDS
09:26	5	0.2	13.24	6.2	5.94	13.32	199.9	0.119	-	3.66	No TDS
09:31	5	0.2	13.25	6	5.91	13.63	197.8	0.112	-	3.49	No TDS
09:36	5	0.2	13.25	6	5.94	13.78	198.7	0.109	-	3	No TDS
09:41	5	0.2	13.25	6.3	6.05	13.72	198.7	0.106	-	3.11	No TDS
09:46	5	0.2	13.25	6.1	6.04	13.64	195.7	0.098	-	3.58	No TDS
09:51	5	0.2	13.25	6.1	5.95	13.7	197.6	0.098	-	2.06	No TDS
09:56	5	0.2	13.25	6.1	5.9	13.82	198.7	0.097	-	2.25	No TDS
10:01	5	0.2	13.25	6.1	6.02	13.93	198.8	0.092	-	2.1	No TDS

Low-Flow Groundwater Purge And Sample Log

10:06	5	0.2	13.26	6.2	6.07	13.49	199.1	0.09	-	1.59	No TDS
10:11	5	0.2	13.25	6	6.02	13.31	197.4	0.088	-	2.08	No TDS
10:16	5	0.2	13.25	6.3	5.95	13.7	200.5	0.086	-	2.33	No TDS
10:21	5	0.2	13.24	6.4	5.8	13.07	198.1	0.088	-	1.64	No TDS
10:26	5	0.2	13.24	6.4	5.88	13.08	195.9	0.084	-	1.7	No TDS

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
10:26	5	0.2	13.24	6.4	5.88	13.08	195.9	0.084	-	1.7	No TDS

Sample Type:	Existing MW	Sample Number:	BTV-MW-14-01	Sample Equipment:	peristaltic and HDPE
Duplicate:	-			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:		Date:	-	By:	-
Discharge Water Dispostion:	55-gallon				
Comments:	Retained bailer in well casing. Did not leave tubing in the well			Drum No.:	-
Prepared by:	Aaron Sutton				
Date Prepared:	12-Jun-2019				



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN	AOC:	1	Date:	7/11/2019			
Well ID:	BTV-MW-14		Samplers:	Aaron Sutton							
Purge Start Date:	7/11/2019		Time:	14:17	Purge End Date:	7/11/2019	Time:	15:22			
Weather:	Wind:	4 mph, NE	Precipitation:	None	Sky:	Overcast	Temperature °F:	83			
Well Labeled:	No		Well Secured:	Yes	Comments:	-					
PID SN:	110-014589		Well Headspace (PID mu):		0.1		Odor:	none			
Water Level Instrument:	Heron				Serial No.:	16820					
SWL beginning (BTOC):	13.08		WL After pump install (BTOC):		13.08		Max Drawdown (in.):	1.1			
Well Casing (inches):	2		Borehole diameter:		6		Sandpack length (ft.):	Unknown			
Screen Length:	Unknown		Parameters Measured With:		YSI 14K100940						
Water Column height (ft.):	9.52		Total Purge Volume (gallons):		2.6		Purge Method:	Low Flow			
Max Purge Rate mL/min.:	170		Sampling Flow Rate mL/min:		150						
Pump Type:	peristaltic		Pump Vol.:	0	Tubing Material:	HDPE					
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	24.5	Total Pump + Tubing + Flow Cell Vol.:		0.3			
Well Casing Vol. (gallons):	1.55		Sandpack Vol. (gal.):	Unknown	Total Well Volume (gal.):	Unknown					
Depth of pump inlet (BTOC):	20.1		Rationale:	Assuming 5 ft screen at bottom, set intake at middle of assumed screen							

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
14:17	0	0	13.41	13.6	7.97	9.25	172.4	0.156	-	8.81	No TDS
14:22	5	0.2	13.49	13.2	7.53	9.34	191	0.148	-	6.02	No TDS
14:27	5	0.2	13.49	13.3	7.28	9.27	201.2	143	-	3.2	No TDS
14:32	5	0.2	13.5	13.3	7.1	9.28	207.3	0.133	-	2.94	No TDS
14:37	5	0.2	13.5	13.5	6.96	9.21	209.5	0.132	-	2.86	No TDS
14:42	5	0.2	13.5	13.4	6.86	9.19	214.5	0.119	-	3.92	No TDS
14:47	5	0.2	13.5	13.3	6.76	9.24	213.4	0.114	-	3.7	No TDS
14:52	5	0.2	13.48	13.4	6.78	9.06	211.4	0.113	-	4.48	No TDS
14:57	5	0.2	13.47	13.2	6.66	8.98	213.8	0.105	-	4.54	No TDS
15:02	5	0.2	13.47	13.4	6.66	8.9	215.5	0.107	-	2.22	No TDS
15:07	5	0.2	13.47	13.4	6.64	8.86	214.8	0.105	-	2.16	No TDS
15:12	5	0.2	13.48	13.3	6.6	8.81	215.7	0.1	-	2.75	No TDS
15:17	5	0.2	13.48	13.2	6.56	8.84	216.8	0.098	-	2.87	No TDS

Low-Flow Groundwater Purge And Sample Log

15:22	5	0.2	13.48	13.1	6.52	8.87	218.2	0.097	-	2.45	No TDS

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
15:22	5	0.2	13.48	13.1	6.52	8.87	218.2	0.097	-	2.45	0

Sample Type:	Existing MW	Sample Number:	BTV-MW-14-02	Sample Equipment:	peristaltic and HDPE
Duplicate:	BTV-MW-14-92			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:		Date:	-	By:	-
Discharge Water Dispostion:	dumped on				
Comments:	Dedicated equipment			Drum No.:	-
Prepared by:	Kylah Wyatt				
Date Prepared:	11-Jul-19				

Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN	AOC:	1	Date:	06/11/2019			
Well ID:	MW-101		Samplers:	Dan Chamberland							
Purge Start Date:	06/11/2019		Time:	11:45	Purge End Date:	06/11/2019	Time:	12:38			
Weather:	Wind:	10 mph, NW	Precipitation:	Rain	Sky:	Overcast	Temperature °F:	65			
Well Labeled:	Yes		Well Secured:	No	Comments:						
PID SN:	110-014589		Well Headspace (PID mu):		0.3		Odor:	none			
Water Level Instrument:	Heron				Serial No.:	3010-1078					
SWL beginning (BTOC):	3.35		WL After pump install (BTOC):		3.35		Max Drawdown (in.):	3.8			
Well Casing (inches):	2		Borehole diameter:		4		Sandpack length (ft.):	Unknown			
Screen Length:	-		Parameters Measured With:		YSI 10E100237						
Water Column height (ft.):	9.88		Total Purge Volume (gallons):		8.5		Purge Method:	Low Flow			
Max Purge Rate mL/min.:	100		Sampling Flow Rate mL/min:		100						
Pump Type:	peristaltic		Pump Vol.:		0		Tubing Material:	HDPE			
Flow Cell Vol.:	0.06	Vol./ft.:	0.01	Total ft.:	15	Total Pump + Tubing + Flow Cell Vol.:		0.21			
Well Casing Vol. (gallons):	1.61		Sandpack Vol. (gal.):		Unknown	Total Well Volume (gal.):		1.13			
Depth of pump inlet (BTOC):	11.7		Rationale:		2.5 feet off of the bottom						

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
11:45	0	0	3.35	10.6	6.92	4.34	42.8	1.31	-	15.2	-
11:50	5	0.2	3.63	10.5	6.89	3.77	41.3	1.29	-	8.44	-
11:55	5	0.4	3.65	10.6	6.89	3.56	39.1	1.29	-	6.6	-
12:00	5	0.6	3.66	10.6	6.89	3.53	37.9	1.28	-	4.34	No TDS
12:05	5	0.7	3.66	10.5	6.89	3.57	38	1.28	-	2.91	No TDS
12:10	5	0.9	3.67	10.4	6.9	3.62	40	1.28	-	2.24	No tds
12:15	5	1.1	3.67	10.5	6.9	3.7	40.9	1.28	-	0.57	-
12:20	5	1.2	3.67	10.5	6.9	3.77	42.5	1.28	-	0.02	-
12:25	5	1.4	3.67	10.6	6.91	3.9	44.1	1.28	-	0.02	-

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
12:25	5	1.4	3.67	10.6	6.91	3.9	44.1	1.28	-	0.02	-

Sample Type:	Existing MW	Sample Number:	MW-101-01	Sample Equipment:	peristaltic and HDPE
Duplicate:	-			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:	Date:	11-Jun-2019	By: Dan Chamberland	Discharge Water Dispostion:	-
Comments:	Water discharged to onsite tote			Drum No.:	-
Prepared by:	Dan Chamberland				
Date Prepared:	11-Jun-2019				

Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN		AOC:	1	Date:	07/12/2019		
Well ID:	MW-101		Samplers:	Aaron Sutton							
Purge Start Date:	07/12/2019		Time:	09:02	Purge End Date:		07/12/2019	Time:	10:04		
Weather:	Wind:	0 mph, N	Precipitation:	None		Sky:	Overcast	Temperature °F:	72		
Well Labeled:	Yes		Well Secured:	No		Comments:	Needs a new lock				
PID SN:	110-902957			Well Headspace (PID mu):		0		Odor:	none		
Water Level Instrument:	Heron					Serial No.:	16820				
SWL beginning (BTOC):	3.87			WL After pump install (BTOC):		3.87		Max Drawdown (in.):	5.4		
Well Casing (inches):	2			Borehole diameter:		4		Sandpack length (ft.):	Unknown		
Screen Length:	1 - 11			Parameters Measured With:		YSI 10D101382					
Water Column height (ft.):	7.13		Total Purge Volume (gallons):		3.8		Purge Method:	Low Flow			
Max Purge Rate mL/min.:			210	Sampling Flow Rate mL/min:		210					
Pump Type:	peristaltic		Pump Vol.:	0		Tubing Material:	HDPE				
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	13	Total Pump + Tubing + Flow Cell Vol.:		0.0502			
Well Casing Vol. (gallons):	1.79			Sandpack Vol. (gal.):	Unknown	Total Well Volume (gal.):		Unknown			
Depth of pump inlet (BTOC):	7.5			Rationale:	Aimed for middle of water column within screened interval						

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
09:02	0	0	3.93	13.6	6.66	3.05	99.9	1.37	-	48.9	No TDS
09:07	5	0.3	4.1	13.5	6.66	2.26	58.7	1.34	-	12.4	No TDS
09:12	5	0.3	4.19	13.5	6.69	2.4	34.4	1.34	-	9.94	No TDS
09:17	5	0.3	4.3	13.7	6.7	2.6	23.3	1.34	-	5.9	No TDS
09:22	5	0.2	4.32	13.7	6.72	2.88	17.3	1.35	-	4.85	No TDS
09:27	5	0.3	4.31	13.6	6.75	3.07	13.5	1.35	-	4.33	No TDS
09:32	5	0.3	4.33	13.4	6.77	3.13	12.2	1.35	-	3.99	No TDS
09:37	5	0.3	4.35	13.5	6.78	3.37	10.7	1.35	-	4.94	No TDS
09:40	3	0.2	4.37	13.5	6.79	3.26	9.5	1.35	-	1.54	No TDS
09:43	3	0.2	4.35	13.4	6.79	3.09	10.3	1.35	-	2.06	No TDS
09:46	3	0.2	4.34	13.4	6.79	3.16	9.4	1.34	-	3	No TDS
09:49	3	0.2	4.35	13.4	6.8	3	8.4	1.34	-	3.61	No TDS
09:52	3	0.2	4.37	13.4	6.8	2.94	7.8	1.33	-	3.45	No TDS
09:55	3	0.2	4.38	13.5	6.8	3.42	7.8	1.35	-	2.15	No TDS

Low-Flow Groundwater Purge And Sample Log

09:58	3	0.2	4.35	13.2	6.81	3.4	8	1.33	-	1.25	No TDS
10:01	3	0.2	4.38	13.4	6.8	3.35	8.4	1.35	-	0.65	No TDS
10:04	3	0.2	4.38	13.4	6.8	3.46	8.4	1.34	-	1.3	No TDS

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
10:04	3	0.2	4.38	13.4	6.8	3.46	8.4	1.34	-	1.3	0

Sample Type:	Existing MW	Sample Number:	MW-101-02		Sample Equipment:	peristaltic and HDPE	
Duplicate:	-				MS/MSD:	-	
Sample Filtered:	No	Filter Type/Size:	-		Equipment Rinsate Sample No.:	-	
Sample Equipment Decon:		Date:	-	By:	-	Discharge Water Dispostion:	dumped on
Comments:	-					Drum No.:	-
Prepared by:	Aaron Sutton						
Date Prepared:	12-Jul-2019						

Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN		AOC:	1	Date:	06/10/2019		
Well ID:	MW-105		Samplers:	Tom Horn, Dan Griffiths							
Purge Start Date:	06/10/2019		Time:	11:58	Purge End Date:		06/10/2019	Time:	13:00		
Weather:	Wind:	10 mph, S	Precipitation:	None		Sky:	Sunny	Temperature °F:	75		
Well Labeled:	Yes		Well Secured:	Yes		Comments:	-				
PID SN:	110-014083				Well Headspace (PID mu):		0.03	Odor:	none		
Water Level Instrument:	Heron						Serial No.:	3010-1078			
SWL beginning (BTOC):	10.94				WL After pump install (BTOC):		10.94	Max Drawdown (in.):	42.72		
Well Casing (inches):	2				Borehole diameter:		Unknown	Sandpack length (ft.):	Unknown		
Screen Length:	Unknown				Parameters Measured With:		YSI				
Water Column height (ft.):	86.66		Total Purge Volume (gallons):		0.9		Purge Method:	Low Flow			
Max Purge Rate mL/min.:			90		Sampling Flow Rate mL/min:		90				
Pump Type:	peristaltic		Pump Vol.:		0		Tubing Material:	HDPE			
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	-	Total Pump + Tubing + Flow Cell Vol.:		Unknown			
Well Casing Vol. (gallons):	14.14			Sandpack Vol. (gal.):	Unknown	Total Well Volume (gal.):		Unknown			
Depth of pump inlet (BTOC):	-			Rationale:	-						

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
11:58	0	0	11.52	14.3	7.04	2.04	87.1	1087	-	22.8	-
12:02	4	0.073968	11.93	14.2	7.11	1.43	80.1	1085	-	5.79	-
12:06	4	0.095102	12.26	14.4	7.12	1.26	77	1084	-	2.02	-
12:10	4	0.073968	12.81	14	7.13	1.16	75.1	1083	-	1.24	-
12:17	7	0	13.01	14.6	7.12	1.33	72.3	1084	-	3.3	-
12:22	5	0.099065	13.28	14.8	7.12	1.3	73.4	1083	-	1.9	-
12:27	5	0.092461	13.58	14.8	7.11	1.22	74.9	1085	-	2.42	-
12:33	6	0.118878	13.74	15	7.11	1.16	76.3	1087	-	1.97	-
12:37	4	0.079252	13.94	14.8	7.11	1.29	77.1	1083	-	1.94	-
12:41	4	0.073968	14.09	15	7.11	1.15	77.5	1084	-	2.3	-
12:45	4	0.079252	14.29	14.7	7.11	1.15	77.3	1084	-	1.86	-
13:00	15	0.118878	14.5	14.6	7.1	1.13	77.6	1092	-	2.65	-

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
13:00	15	0.904792	14.5	14.6	7.1	1.13	77.6	1092	-	2.65	0

Sample Type:	Existing MW	Sample Number:	MW-105-01	Sample Equipment:	peristaltic and HDPE
Duplicate:	-			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:		Date:	-	By:	-
Discharge Water Dispostion:	-				
Comments:	-			Drum No.:	-
Prepared by:	Dan Chamberland				
Date Prepared:	10-Jun-2019				



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN	AOC:	1	Date:	06/30/2019			
Well ID:	MW-105		Samplers:	Dan Chamberland							
Purge Start Date:	06/30/2019		Time:	13:30	Purge End Date:	06/30/2019	Time:	15:25			
Weather:	Wind:	10 mph, NE	Precipitation:	Rain	Sky:	Overcast	Temperature °F:	70			
Well Labeled:	Yes		Well Secured:	Yes	Comments:	-					
PID SN:	592-919025		Well Headspace (PID mu):		0.5		Odor:	none			
Water Level Instrument:	Solinst				Serial No.:	3010-1133					
SWL beginning (BTOC):	10.35		WL After pump install (BTOC):		10.35		Max Drawdown (in.):	114.8			
Well Casing (inches):	2		Borehole diameter:		Unknown		Sandpack length (ft.):	Unknown			
Screen Length:	Unknown		Parameters Measured With:		YSI 17M100413						
Water Column height (ft.):	88.4		Total Purge Volume (gallons):		3.2		Purge Method:	Low Flow			
Max Purge Rate mL/min.:	150		Sampling Flow Rate mL/min:		75						
Pump Type:	peristaltic		Pump Vol.:	0	Tubing Material:	HDPE					
Flow Cell Vol.:	0.05	Vol./ft.: 0.01	Total ft.:	80	Total Pump + Tubing + Flow Cell Vol.:		0.051				
Well Casing Vol. (gallons):	15.9		Sandpack Vol. (gal.):	Unknown	Total Well Volume (gal.):		Unknown				
Depth of pump inlet (BTOC):	95		Rationale:	-							

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
13:30	0	0	10.35	10.8	6.83	6.81	141.7	0.95	-	6.72	-
13:35	10	0.4	12.7	10.6	7.08	0.26	145.5	0.98	-	9999	-
13:40	5	0.2	13.64	10.8	7.05	0.33	135.7	0.95	-	946	-
13:45	5	0.2	14.3	10.7	7.01	0.33	103.6	0.95	-	747	-
13:50	5	0.2	15.1	10.9	6.98	0.26	67.7	0.95	-	507	-
13:55	5	0.2	15.52	10.7	6.97	0.25	50.4	0.94	-	424	-
14:00	5	0.2	16.08	10.8	6.97	0.23	40.6	0.94	-	406	-
14:05	5	0.2	16.6	10.7	6.97	0.22	36.1	0.94	-	399	-
14:10	5	0.1	16.95	11.2	6.97	0.21	33.8	0.95	-	383	-
14:15	5	0.1	17.19	11.1	6.98	0.21	32.5	0.95	-	389	-
14:20	5	0.1	17.72	11.1	6.98	0.2	30.5	0.95	-	335	-
14:25	5	0.1	17.95	11.1	6.99	0.2	29.4	0.96	-	335	-
14:30	5	0.1	18.18	11.2	6.99	0.21	28.8	0.96	-	305	-

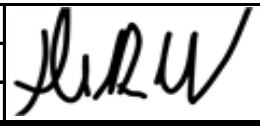
Low-Flow Groundwater Purge And Sample Log

14:35	5	0.1	18.35	11.3	6.99	0.19	28.3	0.95	-	286	-
14:40	5	0.1	18.54	11.2	6.97	0.2	25.5	0.95	-	307	-
14:45	5	0.1	18.9	11	6.96	0.21	23.7	0.95	-	225	-
14:50	5	0.1	19.02	11	6.97	0.21	23	0.95	-	184	-
14:55	5	0.1	19.14	11	6.97	0.2	22.5	0.95	-	178	-
15:00	5	0.1	19.31	10.9	6.96	0.21	21.9	0.95	-	166	-
15:05	5	0.1	19.75	11.3	6.94	0.2	19.4	0.95	-	104	-
15:10	5	0.1	19.74	11.6	6.95	0.21	19	0.96	-	94.5	-
15:15	5	0.1	19.82	11.5	6.95	0.21	18.8	0.95	-	84.6	-
15:20	5	0.1	19.87	11.6	6.94	0.2	18.7	0.96	-	84.9	-
15:25	5	0.1	19.92	11.5	6.95	0.2	18.1	0.95	-	84.4	-

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
15:25	5	3.2	19.92	11.5	6.95	0.2	18.1	0.95	-	84.4	0

Sample Type:	Existing MW	Sample Number:	MW-105-02	Sample Equipment:	peristaltic and HDPE
Duplicate:	-			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:	Date:	-	By:	-	Discharge Water Dispostion: dumped on
Comments:	-			Drum No.:	-
Prepared by:	Dan Chamberland				
Date Prepared:	30-Jun-2019				

Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN	AOC:	2	Date:	06/02/2019			
Well ID:	MW-401		Samplers	Dan Chamberland, Aaron Sutton							
Purge Start Date:	06/02/2019		Time:	14:27	Purge End Date:	06/02/2019	Time:	15:57			
Weather:	Wind:	10 mph, NW	Precipitation:	Rain	Sky:	Overcast	Temperature °F:	62			
Well Labeled:	No		Well Secured:	Yes	Comments:	Lid doesn't sit flush due to riser height					
PID SN:	-		Well Headspace (PID mu):		-		Odor:	none			
Water Level Instrument:	Solinst				Serial No.:	-					
SWL beginning (BTOC):	25.42		WL After pump install (BTOC):		25.42		Max Drawdown (in.):	0.6			
Well Casing (inches):	2		Borehole diameter:		4		Sandpack length (ft.):	Unknown			
Screen Length:	31.62 - 36.62		Parameters Measured With:		YSI						
Water Column height (ft.):	11.2		Total Purge Volume (gallons):		3.8		Purge Method:	Low Flow			
Max Purge Rate L/min.:	0.15		Sampling Flow Rate mL/min:		150						
Pump Type:	peristaltic		Pump Vol.:	0			Tubing Material:	HDPE			
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	37.12	Total Pump + Tubing + Flow Cell Vol.:		0.42			
Well Casing Vol. (gallons):	5.97		Sandpack Vol. (gal.):		Unknown	Total Well Volume (gal.):		Unknown			
Depth of pump inlet (BTOC):	34.12		Rationale:		Middle of screen						

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
14:27	0	0	25.5	9	6.93	6.02	90.7	4.912	-	95.4	Flow rate
14:32	5	0.2	25.45	8.7	6.25	4.9	121.4	0.781	-	61.8	No TDS
14:37	5	0.4	25.47	8.6	6.3	4.83	119.1	0.803	-	47.9	-
14:42	5	0.2	25.47	8.4	6.37	4.64	115.6	0.843	-	45.9	No TDS
14:47	5	0.2	25.47	8.5	6.45	4.82	113.1	0.846	-	42	-
14:52	5	0.2	25.47	8.3	6.52	4.67	112	0.895	-	34.3	-
14:57	5	0.2	25.49	8.3	6.62	4.64	111.8	0.906	-	31.2	-
15:02	5	0.2	25.48	8.3	6.62	4.67	112.2	0.899	-	21.7	-
15:07	5	0.2	25.46	8.5	6.54	4.82	113.4	0.899	-	19.2	No TDS
15:12	5	0.2	25.45	8.4	6.69	4.74	111.6	0.912	-	16.8	-
15:17	5	0.2	25.47	8.4	6.65	4.83	112.2	0.91	-	13.2	-
15:22	5	0.2	25.47	8.3	6.63	4.81	113.3	0.927	-	14	-
15:27	5	0.2	25.47	8.2	6.62	4.79	113.9	0.921	-	10.9	No TDS

Low-Flow Groundwater Purge And Sample Log

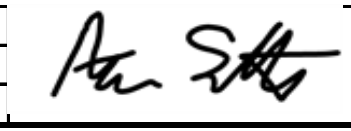
15:32	5	0.2	25.46	8.1	6.64	4.62	114.4	0.93	-	9.82	-
15:37	5	0.2	25.47	8	6.6	4.99	115.9	0.923	-	6.85	-
15:42	5	0.2	25.47	8	6.63	4.92	117	0.925	-	5.86	-
15:47	5	0.2	25.46	8	6.63	4.92	116.6	0.932	-	5.17	-
15:52	5	0.2	25.47	8	6.66	4.96	117.4	0.942	-	5.2	-
15:57	5	0.2	25.47	7.9	6.69	5.02	117	0.943	-	4.51	-

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
15:57	5	3.8	25.47	7.9	6.69	5.02	117	0.943	-	4.51	0

Sample Type:	Existing MW	Sample Number:	MW-401-01	Sample Equipment:	peristaltic and HDPE
Duplicate:	-			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:		Date:	-	By:	-
Discharge Water Dispostion:	55-gallon				
Comments:	-			Drum No.:	-
Prepared by:	Dan Chamberland				
Date Prepared:	02-Jun-2019				



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN		AOC:	2	Date:	06/30/2019		
Well ID:	MW-401		Samplers:	Kylah Wyatt							
Purge Start Date:	06/30/2019		Time:	09:27	Purge End Date:		06/30/2019	Time:	10:07		
Weather:	Wind:	5 mph, N	Precipitation:	None		Sky:	Sunny		Temperature °F:	90	
Well Labeled:	Yes		Well Secured:	Yes		Comments:	-				
PID SN:	-			Well Headspace (PID mu):			-		Odor:	none	
Water Level Instrument:		Solinst					Serial No.:		251927		
SWL beginning (BTOC):		25.12		WL After pump install (BTOC):			25.12		Max Drawdown (in.):	0.48	
Well Casing (inches):		2			Borehole diameter:		Unknown		Sandpack length (ft.):	Unknown	
Screen Length:	31.5 - 36.5				Parameters Measured With:			YSI 18h100703			
Water Column height (ft.):		11.38	Total Purge Volume (gallons):			2.5		Purge Method:		Low Flow	
Max Purge Rate mL/min.:			200		Sampling Flow Rate mL/min:			200			
Pump Type:	peristaltic		Pump Vol.:		0			Tubing Material:		HDPE	
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	40	Total Pump + Tubing + Flow Cell Vol.:				0.0507	
Well Casing Vol. (gallons):		5.95		Sandpack Vol. (gal.):		Unknown	Total Well Volume (gal.):			Unknown	
Depth of pump inlet (BTOC):		34		Rationale:		No construction info, assume 5 ft screen					

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
09:27	0	0	-	-	-	-	-	-	-	-	-
09:35	8	0.4	25.24	12.4	8.27	0.57	-88.9	1.24	-	172	-
09:38	3	0.2	25.24	12.1	8.4	0.75	-81.6	1.22	-	122	-
09:41	3	0.2	25.24	12	8.37	2.56	-56.6	1.06	-	70	-
09:44	3	0.2	25.25	12.1	8.29	2.66	-32.7	0.93	-	48.3	-
09:49	5	0.3	25.25	12	8.22	3.17	-19.9	0.85	-	28.7	-
09:52	3	0.2	25.26	11.7	8.21	3.53	-15.1	0.81	-	19.8	-
09:55	3	0.2	25.27	11.9	8.19	3.53	-14.3	0.8	-	15.8	-
09:58	3	0.2	25.27	11.9	8.17	3.66	-13.7	0.78	-	10.6	-
10:01	3	0.2	25.27	11.9	8.16	4	-11.8	0.77	-	9.94	-
10:04	3	0.2	25.27	11.9	8.17	4.05	-10.8	0.76	-	9.1	-
10:07	3	0.2	25.28	11.8	8.18	3.8	-13	0.75	-	9.98	-

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
10:07	3	2.5	25.28	11.8	8.18	3.8		0.75	-	9.98	0

Sample Type:	Existing MW	Sample Number:	MW-401-02	Sample Equipment:	peristaltic and HDPE
Duplicate:	-			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:	Date:	-	By:	-	Discharge Water Dispostion: dumped on
Comments:	Bonded tubing discovered in bottom of well, discarded			Drum No.:	-
Prepared by:	Kylah Wyatt				
Date Prepared:	30-Jun-2019				



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN	AOC:	2	Date:	06/04/2019			
Well ID:	MW-403		Samplers:	Aaron Sutton							
Purge Start Date:	06/04/2019		Time:	09:57	Purge End Date:	06/04/2019	Time:	11:22			
Weather:	Wind:	7 mph, W	Precipitation:	None	Sky:	Sunny	Temperature °F:	56			
Well Labeled:	No		Well Secured:	No	Comments:	No lock					
PID SN:	-		Well Headspace (PID mu):		-		Odor:	none			
Water Level Instrument:	Heron				Serial No.:	16820					
SWL beginning (BTOC):	20.76		WL After pump install (BTOC):		20.76		Max Drawdown (in.):	0			
Well Casing (inches):	2		Borehole diameter:		Unknown		Sandpack length (ft.):	Unknown			
Screen Length:	Unknown		Parameters Measured With:		YSI 10D101384						
Water Column height (ft.):	10.73		Total Purge Volume (gallons):		3.16		Purge Method:	Low Flow			
Max Purge Rate mL/min.:	0.15		Sampling Flow Rate mL/min:		150						
Pump Type:	peristaltic		Pump Vol.:	0	Tubing Material:	HDPE					
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	31.49	Total Pump + Tubing + Flow Cell Vol.:		0.36			
Well Casing Vol. (gallons):	5.14		Sandpack Vol. (gal.):	Unknown	Total Well Volume (gal.):			Unknown			
Depth of pump inlet (BTOC):	29		Rationale:		Assumed middle of screen, 2.5 ft off bottom						

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
09:57	0	0	20.76	7.7	6.88	5.87	210.7	1.217	-	1.73	No TDS
10:02	5	0.184921	20.76	7.8	6.72	3.21	208.7	1.275	-	1.56	No TDS
10:07	5	0.19813	20.76	7.7	6.76	3.1	200.8	1.218	-	0.82	No TDS
10:12	5	0.19813	20.76	7.6	6.72	3.65	195.5	1.204	-	0.69	No TDS
10:17	5	0.19813	20.76	7.5	6.62	4.11	187.4	1.078	-	0.58	No TDS
10:22	5	0.19813	20.76	7.6	6.56	4.48	181.9	1.023	-	0.56	No TDS
10:27	5	0.19813	20.76	7.6	6.54	5.03	177.2	0.967	-	0.58	No TDS
10:32	5	0.19813	20.76	7.6	6.49	5.77	172.8	0.921	-	0.62	No TDS
10:37	5	0.19813	20.76	7.6	6.46	5.99	168.8	0.883	-	0.63	No TDS
10:42	5	0.19813	20.76	7.5	6.59	6.16	166	0.853	-	0.67	No TDS
10:47	5	0.19813	20.76	7.6	6.5	6.24	163	0.83	-	0.66	No TDS
10:52	5	0.19813	20.76	7.5	6.54	6.38	160.8	0.817	-	0.66	No TDS
10:57	5	0.19813	20.76	7.6	6.52	6.56	159.6	0.815	-	0.6	No TDS

Low-Flow Groundwater Purge And Sample Log

11:17	20	0.792519	20.76	7.7	6.84	6.57	155.7	0.817	-	0.68	No TDS

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
11:17	20	3.15687	20.76	7.7	6.84	6.57	155.7	0.817	-	0.68	0

Sample Type:	Existing MW	Sample Number:	MW-403-01	Sample Equipment:	peristaltic and HDPE
Duplicate:	MW-403-91			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:		Date:	-	By:	-
Discharge Water Dispostion:	55-gallon				
Comments:	-			Drum No.:	-
Prepared by:	Aaron Sutton				
Date Prepared:	04-Jun-2019				



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN		AOC:	2	Date:	06/30/2019		
Well ID:	MW-403		Samplers:	Kylah Wyatt							
Purge Start Date:	06/30/2019		Time:	11:25	Purge End Date:	06/30/2019		Time:	11:45		
Weather:	Wind:	5 mph, N	Precipitation:	None		Sky:	Mostly Cloudy		Temperature °F:	78	
Well Labeled:	Yes		Well Secured:	Yes		Comments:	-				
PID SN:	592919025			Well Headspace (PID mu):		0			Odor:	none	
Water Level Instrument:	Solinst					Serial No.:	251927				
SWL beginning (BTOC):	20.48			WL After pump install (BTOC):		20.48			Max Drawdown (in.):	0.24	
Well Casing (inches):	2			Borehole diameter:		Unknown			Sandpack length (ft.):	Unknown	
Screen Length:	26.49 - 31.49			Parameters Measured With:		YSI 18h100703					
Water Column height (ft.):	11.01		Total Purge Volume (gallons):	0.8		Purge Method:	Low Flow				
Max Purge Rate mL/min.:	150		Sampling Flow Rate mL/min:	150							
Pump Type:	peristaltic		Pump Vol.:	0		Tubing Material:	HDPE				
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	35.49	Total Pump + Tubing + Flow Cell Vol.:	0.0506				
Well Casing Vol. (gallons):	5.14		Sandpack Vol. (gal.):	Unknown		Total Well Volume (gal.):	Unknown				
Depth of pump inlet (BTOC):	29.99		Rationale:	No construction info. Assume 5 ft screen.							

PURGE CYCLE

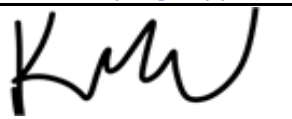
Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
11:25	0	0	-	-	-	-	-	-	-	-	-
11:30	5	0.2	20.5	13.7	8.03	2.36	-32.7	1.19	-	2.09	-
11:33	3	0.1	20.5	13	8.22	2.83	-41.8	1.06	-	2.1	-
11:36	3	0.1	20.5	13.4	8.2	3.02	-35.2	1.02	-	1.2	-
11:39	3	0.1	20.5	13.3	8.16	3.66	-37.1	0.97	-	1.75	-
11:41	2	0.1	20.5	13.1	8.2	3.61	-36	0.96	-	1.84	-
11:45	4	0.2	20.5	13.2	8.24	3.51	-37.1	0.94	-	1.25	-

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
11:45	4	0.8	20.5	13.2	8.24	3.51	-37.1	0.94	-	1.25	0

Sample Type:	Existing MW	Sample Number:	MW-403-02	Sample Equipment:	peristaltic and HDPE
Duplicate:	-			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:	Date:	-	By:	-	Discharge Water Dispostion: dumped on
Comments:	Dedicated/ disposable equipment used. Total purge approx 1.25 gal			Drum No.:	-
Prepared by:	Kylah Wyatt				
Date Prepared:	29-Jun-2019				



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN	AOC:	2	Date:	06/02/2019			
Well ID:	MW-405		Samplers	Dan Chamberland, Aaron Sutton							
Purge Start Date:	06/02/2019		Time:	10:59	Purge End Date:	06/02/2019	Time:	12:23			
Weather:	Wind:	9 mph, S	Precipitation:	None	Sky:	Mostly Cloudy	Temperature °F:	63			
Well Labeled:	No		Well Secured:	Yes	Comments:	1 bolt missing, lid partially destroyed at missing bolthole					
PID SN:	-		Well Headspace (PID mu):		-		Odor:	none			
Water Level Instrument:	Solinst				Serial No.:	288002					
SWL beginning (BTOC):	15.28		WL After pump install (BTOC):		15.28		Max Drawdown (in.):	0			
Well Casing (inches):	2		Borehole diameter:		2		Sandpack length (ft.):	Unknown			
Screen Length:	17.28 - 22.28		Parameters Measured With:		YSI						
Water Column height (ft.):	7		Total Purge Volume (gallons):		3.7		Purge Method:	Low Flow			
Max Purge Rate L/min.:			0.15		Sampling Flow Rate mL/min: -		150				
Pump Type:	peristaltic		Pump Vol.:		0		Tubing Material:	HDPE			
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	22.28	Total Pump + Tubing + Flow Cell Vol.:		0.27			
Well Casing Vol. (gallons):	3.63		Sandpack Vol. (gal.):		Unknown	Total Well Volume (gal.):		Unknown			
Depth of pump inlet (BTOC):	19.78		Rationale:		Middle of screen						

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
10:59	0	0.3	15.28	7.8	6.62	0.54	-82.2	1.296	-	8.03	No TDS
11:09	10	0.4	-	7.9	6.7	0.39	-104.8	1.291	-	1.7	No TDS
11:14	5	0.2	-	7.7	6.79	0.43	-116.7	1.286	-	1.3	No TDS
11:19	5	0.2	-	7.6	6.86	0.47	-125	1.278	-	0.87	No TDS
11:24	5	0.2	-	7.7	6.9	0.63	-130.8	1.281	-	1.13	No TDS
11:34	10	0.4	15.24	8	7.17	1.03	-137.8	1.295	-	15.1	No TDS
11:39	5	0.2	15.24	7.8	7.09	0.53	-138.3	1.28	-	8.58	No TDS
11:46	7	0.3	15.24	7.8	7.05	0.43	-140.6	1.275	-	3.01	No TDS
11:49	3	0.1	15.24	8	7.06	0.4	-141.9	1.276	-	2.36	No TDS
11:54	5	0.2	15.24	7.8	7.08	0.35	-144.8	1.271	-	1.96	No TDS
12:00	6	0.2	15.24	8	7.09	0.31	-146.7	1.272	-	1.53	No TDS
12:05	5	0.2	15.24	7.9	7.11	0.32	-148.5	1.27	-	1.33	No TDS
12:09	4	0.2	15.24	8	7.12	0.3	-149.3	1.269	-	1.2	No TDS
12:14	5	0.2	15.24	7.8	7.13	0.31	-150.5	1.264	-	1.22	No TDS

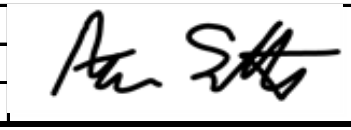
Low-Flow Groundwater Purge And Sample Log

12:23	9	0.4	15.24	7.9	7.16	0.52	-108.8	1.263	-	1.94	No TDS

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
12:23	9	3.7	15.24	7.9	7.16	0.52		1.263	-	1.94	0

Sample Type:	Existing MW	Sample Number:	MW-405-01	Sample Equipment:	peristaltic and HDPE
Duplicate:	-			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:	Date:	-	By:	-	Discharge Water Dispostion: 55-gallon
Comments:	-				Drum No.: 1
Prepared by:	Aaron Sutton				
Date Prepared:	02-Jun-2019				



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN	AOC:	2	Date:	06/29/2019			
Well ID:	MW-405		Samplers:	Dan Chamberland							
Purge Start Date:	06/29/2019		Time:	16:40	Purge End Date:	06/29/2019	Time:	17:35			
Weather:	Wind:	5 mph, W	Precipitation:	None	Sky:	Partly Cloudy	Temperature °F:	75			
Well Labeled:	No		Well Secured:	Yes	Comments:	Volatile odor in the area					
PID SN:	592-919025		Well Headspace (PID mu):		0		Odor:	none			
Water Level Instrument:	Solinst				Serial No.:	3010-1133					
SWL beginning (BTOC):	14.85		WL After pump install (BTOC):		14.85		Max Drawdown (in.):	0.1			
Well Casing (inches):	1		Borehole diameter:		2		Sandpack length (ft.):	Unknown			
Screen Length:	17.28 - 22.28		Parameters Measured With:		YSI 17M100413						
Water Column height (ft.):	7.43		Total Purge Volume (gallons):		2.2		Purge Method:	Low Flow			
Max Purge Rate mL/min.:	150		Sampling Flow Rate mL/min:		150						
Pump Type:	peristaltic		Pump Vol.:	0	Tubing Material:	HDPE					
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	27	Total Pump + Tubing + Flow Cell Vol.:		0.0504			
Well Casing Vol. (gallons):	-0.61		Sandpack Vol. (gal.):		Unknown	Total Well Volume (gal.):		Unknown			
Depth of pump inlet (BTOC):	3.63		Rationale:		Off the bottom to prevent sucking up any sediment.						

PURGE CYCLE

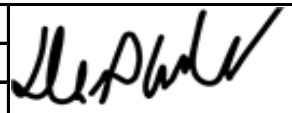
Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
16:40	0	0	14.85	12.9	7.46	0.37	-149.3	1.37	-	13.8	-
16:45	5	0.2	14.85	12	7.48	0.2	-162.2	1.35	-	6.67	-
16:50	5	0.2	14.85	11.9	7.43	0.17	-147.9	1.33	-	4.7	-
16:55	5	0.2	14.85	11.8	7.44	0.17	-142.6	1.34	-	3.69	-
17:00	5	0.2	14.85	11.7	7.43	0.15	-123.2	1.33	-	2.88	-
17:05	5	0.2	14.85	13.9	7.4	1.38	-134.6	1.4	-	24	-
17:10	5	0.2	14.85	12.2	7.43	0.32	-141.6	1.34	-	14.3	-
17:15	5	0.2	14.85	12.5	7.43	0.22	-156.7	1.35	-	8.01	-
17:20	5	0.2	14.85	12.4	7.44	0.22	-164.7	1.35	-	4.47	-
17:25	5	0.2	14.85	12.3	7.45	0.2	-167	1.35	-	3.61	-
17:30	5	0.2	14.86	12.2	7.46	0.19	-169.4	1.35	-	3.49	-
17:35	5	0.2	14.86	12	7.45	0.17	-171.2	1.34	-	3.25	-

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
17:35	5	2.2	14.86	12	7.45	0.17		1.34	-	3.25	0

Sample Type:	Existing MW	Sample Number:	MW-405-02	Sample Equipment:	peristaltic and HDPE
Duplicate:	-			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:	Date:	-	By:	-	Discharge Water Dispostion: dumped on
Comments:	Slight sheen on water			Drum No.:	-
Prepared by:	Dan Chamberland				
Date Prepared:	30-Jun-2019				



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN		AOC:	1	Date:	06/10/2019		
Well ID:	V1-BR-08		Samplers:	Kylah Wyatt							
Purge Start Date:	06/10/2019		Time:	09:32	Purge End Date:		06/10/2019	Time:	10:25		
Weather:	Wind:	3 mph, N	Precipitation:	-		Sky:	Sunny		Temperature °F:	75	
Well Labeled:	Yes		Well Secured:	Yes		Comments:	-				
PID SN:	592919025u4			Well Headspace (PID mu):			0.2		Odor:	none	
Water Level Instrument:		Solinst					Serial No.:		30101133		
SWL beginning (BTOC):		29.02		WL After pump install (BTOC):			29.02		Max Drawdown (in.):	27.2	
Well Casing (inches):		2			Borehole diameter:		Unknown		Sandpack length (ft.):	Unknown	
Screen Length:	Unknown				Parameters Measured With:		YSI 10d101384				
Water Column height (ft.):		20.34	Total Purge Volume (gallons):			1.2		Purge Method:		Low Flow	
Max Purge Rate mL/min.:			50		Sampling Flow Rate mL/min:		45				
Pump Type:	peristaltic		Pump Vol.:		0			Tubing Material:		HDPE	
Flow Cell Vol.:	0.05	Vol./ft.:	0	Total ft.:		53	Total Pump + Tubing + Flow Cell Vol.:			0.05	
Well Casing Vol. (gallons):		7.75			Sandpack Vol. (gal.):		Unknown	Total Well Volume (gal.):		Unknown	
Depth of pump inlet (BTOC):		45			Rationale:		No Construction information screen length assumed to be 5 feet				

PURGE CYCLE

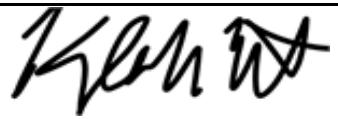
Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
09:32	0	0	29.02	-	-	-	-	-	-	-	-
09:46	14	0.1	29.91	-	-	-	-	-	-	-	-
09:55	9	0.1	30.16	11	7.02	0.54	-130.5	1.187	-	3.98	-
10:05	10	0.1	30.66	11.5	7.14	0.59	-138.1	1.185	-	5.5	-
10:10	7	0.2	30.83	11.5	7.21	0.47	-140.7	1.165	-	4.27	-
10:15	5	0.2	31.07	12.2	7.24	0.48	-141.2	1.174	-	2.97	-
10:20	5	0.2	31.18	12.5	7.33	0.52	-145.8	1.165	-	2.92	-
10:25	5	0.3	31.29	12.1	7.33	0.49	-144.9	1.161	-	2.96	-

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
10:25	5	1.2	31.29	12.1	7.33	0.49		1.116	-	2.96	0

Sample Type:	Existing MW	Sample Number:	V1-BR-08-01	Sample Equipment:	peristaltic and HDPE
Duplicate:	-			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:		Date:	-	By:	-
Discharge Water Dispostion:	55-gallon				
Comments:	All dedicated equipment used no equipment blank needed. Attempted long purge prior to low flow sampling however ground water level could not stabilize.			Drum No.:	Tote 3
Prepared by:	Kylah Wyatt				
Date Prepared:	10-Jun-2019				



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN		AOC:	1	Date:	07/08/2019		
Well ID:	V1-MW1		Samplers:	Kylah Wyatt							
Purge Start Date:	07/10/2019		Time:	12:05	Purge End Date:		07/10/2019	Time:	12:25		
Weather:	Wind:	5 mph, N	Precipitation:	None		Sky:	Sunny		Temperature °F:	85	
Well Labeled:	Yes		Well Secured:	Yes		Comments:	-				
PID SN:	110-014589			Well Headspace (PID mu):			0		Odor:	none	
Water Level Instrument:		Solinst					Serial No.:		251957		
SWL beginning (BTOC):		8.97		WL After pump install (BTOC):			8.97		Max Drawdown (in.):	0.12	
Well Casing (inches):		2			Borehole diameter:		6		Sandpack length (ft.):		
Screen Length:	11-16				Parameters Measured With:				YSI 14h100036		
Water Column height (ft.):		8.55	Total Purge Volume (gallons):			0.8			Purge Method:		Low Flow
Max Purge Rate mL/min.:			188		Sampling Flow Rate mL/min:				150		
Pump Type:	peristaltic		Pump Vol.:		0			Tubing Material:		HDPE	
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	18		Total Pump + Tubing + Flow Cell Vol.:			0.0503	
Well Casing Vol. (gallons):		2.61		Sandpack Vol. (gal.):		Unknown		Total Well Volume (gal.):		Unknown	
Depth of pump inlet (BTOC):		13.5		Rationale:			5 ft screen. Midscreen.				

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
12:05	0	0	-	-	-	-	-	-	-	-	Pump on
12:10	5	0.2	9.16	14.4	6.96	0.83	79.3	0.465	-	4.33	-
12:15	5	0.2	9.15	14.7	6.91	0.94	76.7	0.462	-	10.4	-
12:18	3	0.1	9.15	14.6	6.84	1.18	75.3	0.456	-	7.95	-
12:21	3	0.1	9.17	14.5	6.8	1.25	74.2	0.459	-	8.43	-
12:25	4	0.2	9.17	14.3	6.8	1.15	75.12	0.458	-	8.79	Conductivity

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
12:25	4	0.8	9.17	14.3	6.8	1.15	75.12	0.458	-	8.79	0

Sample Type:	Existing MW	Sample Number:	V1-MW1-02	Sample Equipment:	peristaltic and HDPE
Duplicate:	-			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:	Date:	-	By:	-	Discharge Water Dispostion: dumped on
Comments:	Dedicated equipment			Drum No.:	-
Prepared by:	Kylah Wyatt				
Date Prepared:	10-Jul-2019				



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN		AOC:	1	Date:	06/10/2019		
Well ID:	V1-MW12		Samplers:	Kylah Wyatt							
Purge Start Date:	06/10/2019		Time:	11:23	Purge End Date:	06/10/2019		Time:	12:05		
Weather:	Wind:	5 mph, N	Precipitation:	None		Sky:	Sunny		Temperature °F:	75	
Well Labeled:	Yes		Well Secured:	Yes		Comments:	Short stick up at top of hill				
PID SN:	592919025u4			Well Headspace (PID mu):		0			Odor:	none	
Water Level Instrument:	Solinst					Serial No.:	288002				
SWL beginning (BTOC):	14.04			WL After pump install (BTOC):		14.04			Max Drawdown (in.):	8.52	
Well Casing (inches):	2				Borehole diameter:	Unknown			Sandpack length (ft.):	Unknown	
Screen Length:	12.86 - 22.86				Parameters Measured With:	YSI 10d101384					
Water Column height (ft.):	11.07		Total Purge Volume (gallons):		2.6			Purge Method:	Low Flow		
Max Purge Rate mL/min.:			75		Sampling Flow Rate mL/min:	75					
Pump Type:	peristaltic		Pump Vol.:		0			Tubing Material:	HDPE		
Flow Cell Vol.:	0.05	Vol./ft.:	0	Total ft.:	28	Total Pump + Tubing + Flow Cell Vol.:			0.05		
Well Casing Vol. (gallons):	3.73			Sandpack Vol. (gal.):	Unknown	Total Well Volume (gal.):			Unknown		
Depth of pump inlet (BTOC):	17.75			Rationale:	Mid screen						

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
11:23	0	0	-	-	-	-	-	-	-	-	Pump on
11:35	12	0.1	14.64	9.9	5.36	4.19	166.9	0.153	-	12.6	-
11:40	5	0.1	14.69	10.6	5.21	4.05	166.2	0.157	-	6.08	-
11:45	5	0.2	14.71	10.1	5.43	3.83	155	0.154	-	6.09	-
11:50	5	0.3	14.72	9.9	5.3	3.89	164.6	0.152	-	6.41	-
11:54	4	0.3	14.74	10.7	5.39	4.28	158.8	0.154	-	4.19	-
11:59	5	0.4	14.73	10.5	5.64	3.77	149.8	0.152	-	4.75	-
12:02	3	0.5	14.74	10.6	5.65	3.75	151.2	0.152	-	4.35	-
12:05	3	0.7	14.75	10.7	5.62	3.76	152.1	0.152	-	5.18	-

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
12:05	3	2.6	14.75	10.7	5.62	3.76	152.1	0.152	-	5.18	0

Sample Type:	Existing MW	Sample Number:	V1-MW12-01	Sample Equipment:	peristaltic and HDPE
Duplicate:	-			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:		Date:	-	By:	-
Discharge Water Dispostion:	55-gallon				
Comments:	how dedicated to being used no equipment blank required total purge volume approximately three quarters of a gallon. The water level following sampling 15.45 feet below top of casing			Drum No.:	Tote 3
Prepared by:	Kylah Wyatt				
Date Prepared:	10-Jun-2019				

Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN	AOC:	1	Date:	07/10/2019			
Well ID:	V1-MW12		Samplers:	Aaron Sutton							
Purge Start Date:	07/10/2019		Time:	12:35	Purge End Date:	07/10/2019	Time:	14:08			
Weather:	Wind:	1 mph, NW	Precipitation:	None	Sky:	Sunny	Temperature °F:	83			
Well Labeled:	Yes		Well Secured:	Yes	Comments:	-					
PID SN:	592-919025		Well Headspace (PID mu):		0.1		Odor:	none			
Water Level Instrument:	Heron				Serial No.:	16820					
SWL beginning (BTOC):	15.3		WL After pump install (BTOC):		15.3		Max Drawdown (in.):	17.88			
Well Casing (inches):	2		Borehole diameter:		Unknown		Sandpack length (ft.):	Unknown			
Screen Length:	12.85 - 22.85		Parameters Measured With:		YSI 16J101780						
Water Column height (ft.):	7.55		Total Purge Volume (gallons):		3.8		Purge Method:	Low Flow			
Max Purge Rate mL/min.:	190		Sampling Flow Rate mL/min:		190						
Pump Type:	peristaltic		Pump Vol.:	0	Tubing Material:	HDPE					
Flow Cell Vol.:	0.05	Vol./ft.: 0.01	Total ft.:	25.5	Total Pump + Tubing + Flow Cell Vol.:		0.0504				
Well Casing Vol. (gallons):	3.73		Sandpack Vol. (gal.):	Unknown	Total Well Volume (gal.):		Unknown				
Depth of pump inlet (BTOC):	19		Rationale:		Aimed for middle of water column						

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
12:35	0	0	15.52	11.3	7.14	1.81	144.2	0.085	-	14.9	No TDS
12:40	5	0.3	15.61	11.1	6.64	1.26	151.2	0.085	-	13.1	No TDS
12:45	5	0.3	15.76	11	6.44	1	150.4	0.09	-	6.26	No TDS
12:50	5	0.2	15.92	10.8	6.35	0.73	115	0.095	-	4.85	No TDS
12:55	5	0.2	16.05	11.4	6.28	0.65	59.5	0.1	-	2.74	No TDS
13:00	5	0.2	16.2	10.8	6.14	0.67	42.9	0.102	-	2.44	No TDS
13:05	5	0.2	16.29	10.9	6.18	0.75	42.3	0.102	-	2.8	No TDS
13:10	5	0.2	16.39	11	6.11	0.79	45.1	0.103	-	2.14	No TDS
13:15	5	0.2	16.48	10.7	6.1	0.82	52	0.108	-	1.98	No TDS
13:20	5	0.2	16.6	10.6	6.14	0.75	58.3	0.115	-	1.51	No TDS
13:25	5	0.2	16.67	11	6.21	0.78	59.2	0.125	-	1.49	No TDS
13:30	5	0.2	16.7	11.2	6.22	0.71	60.5	0.133	-	2.05	No TDS
13:35	5	0.2	16.72	11.2	6.24	0.71	62	0.141	-	1.47	No TDS

Low-Flow Groundwater Purge And Sample Log

13:40	5	0.2	16.74	11.5	6.23	0.66	61.5	0.149	-	2	No TDS
13:45	5	0.2	16.75	11	6.26	0.66	60.6	0.155	-	2.46	No TDS
13:50	5	0.2	16.78	11.4	6.28	0.64	60	0.162	-	1.19	No TDS
13:53	3	0.1	16.79	11.7	6.31	0.62	59.5	0.165	-	1.1	No TDS
13:56	3	0.1	16.79	11.7	6.39	0.59	57.7	0.172	-	2.49	No TDS
13:59	3	0.1	16.78	11.6	6.44	0.61	57	0.184	-	1.1	No TDS
14:02	3	0.1	16.78	11.6	6.34	0.6	57.7	0.188	-	1.52	No TDS
14:05	3	0.1	16.78	11.3	6.4	0.57	56.3	0.191	-	1.4	No TDS
14:08	3	0.1	16.77	11.5	6.45	0.56	56	0.192	-	1.13	No TDS

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
14:08	3	0.1	16.77	11.5	6.45	0.56	56	0.192	-	1.13	0

Sample Type:	Existing MW	Sample Number:	V1-MW12-02	Sample Equipment:	peristaltic and HDPE
Duplicate:	-			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:	Date:	-	By:	-	Discharge Water Dispostion: dumped on
Comments:	-			Drum No.:	-
Prepared by:	Aaron Sutton				
Date Prepared:	17-Jul-2019				

Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN	AOC:	1	Date:	06/03/2019			
Well ID:	V1-MW14		Samplers	Aaron Sutton							
Purge Start Date:	06/03/2019		Time:	15:28	Purge End Date:	06/03/2019	Time:	16:13			
Weather:	Wind:	12 mph, W	Precipitation:	None	Sky:	Mostly Cloudy	Temperature °F:	52			
Well Labeled:	Yes		Well Secured:	Yes	Comments:	-					
PID SN:	-		Well Headspace (PID mu):		-		Odor:	none			
Water Level Instrument:	Solinst				Serial No.:	288002					
SWL beginning (BTOC):	8.67		WL After pump install (BTOC):		8.67		Max Drawdown (in.):	5.4			
Well Casing (inches):	2		Borehole diameter:		Unknown		Sandpack length (ft.):	Unknown			
Screen Length:	6.85 - 11.85		Parameters Measured With:		YSI						
Water Column height (ft.):	3.18		Total Purge Volume (gallons):		2.2		Purge Method:	Low Flow			
Max Purge Rate L/min.:			0.15		Sampling Flow Rate mL/min:		150				
Pump Type:	peristaltic		Pump Vol.:		0		Tubing Material:	HDPE			
Flow Cell Vol.:	0.06	Vol./ft.:	0.01	Total ft.:	10.3	Total Pump + Tubing + Flow Cell Vol.:		0.062			
Well Casing Vol. (gallons):	1.92		Sandpack Vol. (gal.):		Unknown	Total Well Volume (gal.):		Unknown			
Depth of pump inlet (BTOC):	9.3		Rationale:		Assumed middle of screen, 2.5 ft off bottom						

PURGE CYCLE

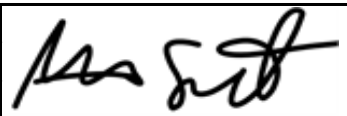
Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
15:28	0	0	8.27	4.3	6.43	1.53	231.8	0.662	-	16.8	No TDS
15:33	5	0.2	8.67	4.4	6.24	1.54	231.6	0.653	-	9.89	No TDS
15:38	5	0.2	8.67	4.4	6.2	1.48	228.2	0.642	-	7.19	No TDS
15:43	5	0.2	8.69	4.5	6.25	1.1	221.9	0.661	-	3.9	No TDS
15:48	5	0.2	8.69	4.5	6.33	0.97	218.1	0.661	-	2.03	No TDS
15:53	5	0.2	8.69	4.5	6.34	0.91	214.4	0.658	-	2.66	No TDS
15:58	5	0.2	8.71	4.5	6.34	0.95	210.3	0.65	-	1.26	No TDS
16:03	5	0.2	8.71	4.5	6.37	0.93	206.7	0.65	-	1.24	No TDS
16:08	5	0.2	8.72	4.5	6.32	1.02	204.1	0.641	-	0.97	No TDS
16:13	5	0.6	8.72	4.5	6.57	1.27	203.3	0.646	-	3.77	No TDS

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
16:13	5	2.2	8.72	4.5	6.57	1.27	203.3	0.646	-	3.77	0

Sample Type:	Existing MW	Sample Number:	V1-MW14-01	Sample Equipment:	peristaltic and HDPE
Duplicate:	-			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:	Date:	-	By:	-	Discharge Water Dispostion: 55-gallon
Comments:	Started filling bottles at 16:13			Drum No.:	-
Prepared by:	Aaron Sutton				
Date Prepared:	03-Jun-2019				



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN	AOC:	1	Date:	06/30/2019			
Well ID:	V1-MW14		Samplers:	Dan Chamberland							
Purge Start Date:	06/30/2019		Time:	11:30	Purge End Date:	06/30/2019	Time:	12:45			
Weather:	Wind:	5 mph, NW	Precipitation:	Rain	Sky:	Overcast	Temperature °F:	64			
Well Labeled:	No		Well Secured:	Yes	Comments:	-					
PID SN:	592-919025		Well Headspace (PID mu):		0		Odor:	none			
Water Level Instrument:	Solinst				Serial No.:	3010-1133					
SWL beginning (BTOC):	9.15		WL After pump install (BTOC):		9.15		Max Drawdown (in.):	7.3			
Well Casing (inches):	2		Borehole diameter:		Unknown		Sandpack length (ft.):	Unknown			
Screen Length:	6.87 - 11.87		Parameters Measured With:		17M100413						
Water Column height (ft.):	2.72		Total Purge Volume (gallons):		2.9		Purge Method:	Low Flow			
Max Purge Rate mL/min.:	150		Sampling Flow Rate mL/min:		150						
Pump Type:	peristaltic		Pump Vol.:	0	Tubing Material:	HDPE					
Flow Cell Vol.:	0.05	Vol./ft.: 0.01	Total ft.:	12	Total Pump + Tubing + Flow Cell Vol.:		0.0502				
Well Casing Vol. (gallons):	1.94		Sandpack Vol. (gal.):	Unknown	Total Well Volume (gal.):		Unknown				
Depth of pump inlet (BTOC):	9.3		Rationale:	In the middle of the presumed 5 foot screen.							

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
11:30	0	0	9.15	10.3	7.02	7.46	192.4	1.06	-	39.1	-
11:35	5	0.2	9.47	10.2	6.48	2.66	205.5	1.06	-	23.3	-
11:40	5	0.2	9.5	10.2	6.49	2.13	196	1.04	-	9.64	-
11:45	5	0.2	9.55	10.3	6.5	1.78	170.2	1.04	-	8.35	-
11:50	5	0.2	9.6	10.2	6.52	1.61	133.2	1.06	-	3.69	-
11:55	5	0.2	9.63	10.1	6.53	1.66	115.3	1.05	-	2.7	-
12:00	5	0.2	9.7	10.2	6.64	1.7	100.7	1.06	-	4.45	-
12:05	5	0.2	9.68	10.2	6.55	1.69	92.5	1.05	-	4.68	-
12:10	5	0.2	9.69	10.3	6.56	1.67	87.2	1.05	-	3.96	-
12:15	5	0.2	9.7	10.2	6.57	1.87	82.8	1.03	-	2.99	-
12:20	5	0.2	9.7	10.1	6.57	2	76.5	1.04	-	4.62	-
12:25	5	0.2	9.7	10.1	6.57	2.09	74.1	1.03	-	3.69	-
12:30	5	0.2	9.71	10.2	6.57	2.62	73.1	1.04	-	2.22	-

Low-Flow Groundwater Purge And Sample Log

12:35	5	0.2	9.71	10.2	6.57	2.76	70.1	1.04	-	3.05	-
12:40	4	0.1	9.75	10.1	6.58	2.65	66.9	1.03	-	2.87	-
12:45	5	0.2	9.76	10.2	6.57	2.51	63.9	1.03	-	3.09	-

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
12:45	5	2.9	9.76	10.2	6.57	2.51	63.9	1.03	-	3.09	0

Sample Type:	Existing MW	Sample Number:	V1-MW14-02		Sample Equipment:	peristaltic and HDPE	
Duplicate:	-				MS/MSD:	-	
Sample Filtered:	No	Filter Type/Size:	-		Equipment Rinsate Sample No.:	-	
Sample Equipment Decon:		Date:	-	By:	-	Discharge Water Dispostion:	dumped on
Comments:	-					Drum No.:	-
Prepared by:	Dan Chamberland						
Date Prepared:	30-Jun-2019						

Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN		AOC:	1	Date:	06/10/2019		
Well ID:	V1-MW-106		Samplers:	Kylah Wyatt, Dan griffiths							
Purge Start Date:	06/10/2019		Time:	13:47	Purge End Date:		06/10/2019	Time:	14:20		
Weather:	Wind:	5 mph, N	Precipitation:	None		Sky:	Sunny		Temperature °F:	80	
Well Labeled:	Yes		Well Secured:	Yes		Comments:	-				
PID SN:	110014083			Well Headspace (PID mu):			0		Odor:	none	
Water Level Instrument:		Heron					Serial No.:		16820		
SWL beginning (BTOC):		6.35		WL After pump install (BTOC):			6.35		Max Drawdown (in.):	0.6	
Well Casing (inches):		2			Borehole diameter:		Unknown		Sandpack length (ft.):	Unknown	
Screen Length:	Unknown				Parameters Measured With:			YSI 10e100237			
Water Column height (ft.):		11.67	Total Purge Volume (gallons):			1		Purge Method:		Low Flow	
Max Purge Rate mL/min.:			80		Sampling Flow Rate mL/min:			80			
Pump Type:	peristaltic		Pump Vol.:		0			Tubing Material:		HDPE	
Flow Cell Vol.:	0.05	Vol./ft.:	0	Total ft.:	Unknown		Total Pump + Tubing + Flow Cell Vol.:			Unknown	
Well Casing Vol. (gallons):		3.02		Sandpack Vol. (gal.):	Unknown		Total Well Volume (gal.):			Unknown	
Depth of pump inlet (BTOC):		16		Rationale:			Assume 5 ft screen since no well construction info available.				

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
13:47	0	0	-	-	-	-	-	-	-	-	-
13:54	7	0.1	6.35	17.3	7.25	0.95	38.9	0.62	-	10.3	-
13:59	5	0.1	6.4	17.2	7.21	0.87	36	0.62	-	0.02	-
14:04	5	0.2	6.4	17.2	7.22	7.7	38.4	0.62	-	8.33	-
14:08	4	0.4	6.4	17.5	7.28	0.77	33.9	0.62	-	3.01	-
14:12	4	0.6	6.4	17.6	7.3	0.82	38.4	0.62	-	0.64	-
14:16	4	0.8	6.4	17.5	7.23	0.88	38.8	0.62	-	0.02	-
14:20	4	1	6.4	17.4	7.23	0.82	40.4	0.62	-	0.02	-

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
14:20	4	1	6.4	17.4	7.23	0.82	40.4	0.62	-	0.02	0

Sample Type:	Existing MW	Sample Number:	V1-MW-106-01	Sample Equipment:	peristaltic and HDPE
Duplicate:	-			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:	Date:	-	By:	-	Discharge Water Dispostion: Tote
Comments:	Dedicated equipment used, NO EB NEEDED. 1 GAL PURGED.			Drum No.:	Tote 3
Prepared by:	Kylah Wyatt				
Date Prepared:	10-Jun-2019	KMW			

Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN	AOC:	1	Date:	07/12/2019			
Well ID:	V1-MW-106		Samplers:	Aaron Sutton							
Purge Start Date:	07/12/2019		Time:	11:02	Purge End Date:	07/12/2019	Time:	11:17			
Weather:	Wind:	0 mph, NW	Precipitation:	None	Sky:	Sunny	Temperature °F:	77			
Well Labeled:	Yes		Well Secured:	Yes	Comments:	-					
PID SN:	110-902957		Well Headspace (PID mu):		0		Odor:	none			
Water Level Instrument:	Heron				Serial No.:	16820					
SWL beginning (BTOC):	8.12		WL After pump install (BTOC):		8.12		Max Drawdown (in.):	0.1			
Well Casing (inches):	2		Borehole diameter:		4		Sandpack length (ft.):	Unknown			
Screen Length:	13.02 - 18.02		Parameters Measured With:		YSI 10D101382						
Water Column height (ft.):	9.9		Total Purge Volume (gallons):		0.6		Purge Method:	Low Flow			
Max Purge Rate mL/min.:			205	Sampling Flow Rate mL/min:		205					
Pump Type:	peristaltic		Pump Vol.:	0		Tubing Material:	HDPE				
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	20	Total Pump + Tubing + Flow Cell Vol.:		0.0503			
Well Casing Vol. (gallons):	2.94		Sandpack Vol. (gal.):	Unknown	Total Well Volume (gal.):		Unknown				
Depth of pump inlet (BTOC):	15.52		Rationale:	Assume 5 ft screen at bottom of well, aimed for middle of screen							

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
11:02	0	0	8.16	17.5	7.05	1.69	38.7	0.69	-	0.42	No TDS
11:07	5	0.3	8.17	17.3	7.06	1.41	39.7	0.67	-	0.02	No TDS
11:12	5	0	8.17	17.1	7.07	1.32	40.1	0.67	-	0.02	No TDS
11:17	5	0.3	8.17	16.9	7.08	1.37	40.1	0.66	-	0.02	No TDS

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
11:17	5	0.3	8.17	16.9	7.08	1.37	40.1	0.66	-	0.02	0

Sample Type:	Existing MW	Sample Number:	V1-MW-106-02	Sample Equipment:	peristaltic and HDPE
Duplicate:	-			MS/MSD:	MS/MSD--02
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:	Date:	-	By:	-	Discharge Water Dispostion: dumped on
Comments:	-			Drum No.:	-
Prepared by:	Aaron Sutton				
Date Prepared:	12-Jul-2019				



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN	AOC:	1	Date:	06/03/2019			
Well ID:	V1-MW-107		Samplers	Aaron Sutton							
Purge Start Date:	06/03/2019		Time:	13:42	Purge End Date:	06/03/2019	Time:	14:52			
Weather:	Wind:	14 mph, W	Precipitation:	None	Sky:	Mostly Cloudy	Temperature °F:	60			
Well Labeled:	Yes		Well Secured:	Yes	Comments:	-					
PID SN:	-		Well Headspace (PID mu):		-		Odor:	none			
Water Level Instrument:	Solinst				Serial No.:	-					
SWL beginning (BTOC):	12.27		WL After pump install (BTOC):		12.27		Max Drawdown (in.):	20.3			
Well Casing (inches):	2		Borehole diameter:		Unknown		Sandpack length (ft.):	Unknown			
Screen Length:	14.46 - 19.46		Parameters Measured With:		YSI						
Water Column height (ft.):	7.19		Total Purge Volume (gallons):		3.14		Purge Method:	Low Flow			
Max Purge Rate L/min.:			0.15		Sampling Flow Rate mL/min:		150				
Pump Type:	peristaltic		Pump Vol.:		0		Tubing Material:	HDPE			
Flow Cell Vol.:	0.06	Vol./ft.:	0.01	Total ft.:	19.5	Total Pump + Tubing + Flow Cell Vol.:		0.0603			
Well Casing Vol. (gallons):	Unknown		Sandpack Vol. (gal.):		Unknown	Total Well Volume (gal.):		Unknown			
Depth of pump inlet (BTOC):	17		Rationale:		Assumed middle of screen, 2.5 feet from bottom						

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
13:42	0	0	12.63	5	5.85	8.37	243.9	0.623	-	8.27	No TDS
13:45	3	0.1	12.7	4.8	5.63	7.4	249.6	0.633	-	7.66	No TDS
13:50	5	0.2	12.82	4.8	5.64	7.32	250.1	0.637	-	11.4	No TDS
13:55	5	0.2	12.94	4.7	5.63	7.6	248.3	0.632	-	16	No TDS
14:01	6	0.2	13.08	4.7	5.8	8.14	245.3	0.623	-	24.5	No TDS
14:05	4	0.2	13.19	4.7	5.66	8.74	243.6	0.617	-	28.3	No TDS
14:10	5	0.2	13.3	4.6	5.87	9.48	243.1	0.612	-	30.7	No TDS
14:15	5	0.2	13.42	4.7	5.89	10.01	242.5	0.617	-	48.4	No TDS
14:19	4	0.2	13.53	4.6	5.9	10.07	242.3	0.616	-	46	No TDS
14:25	6	0.2	13.64	4.5	5.93	10.34	241.8	0.623	-	38.6	No TDS
14:30	5	0.2	13.74	4.5	5.96	10.29	241.4	0.621	-	36.3	No TDS
14:36	6	0.2	13.86	4.5	6	10.59	240.8	0.627	-	41	No TDS
14:41	5	0.2	13.98	4.5	6.02	10.26	240.2	0.626	-	38	No TDS

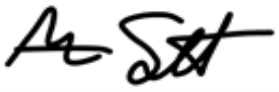
Low-Flow Groundwater Purge And Sample Log

14:45	4	0.2	14.06	4.5	6.05	10.39	239.7	0.623	-	37.1	No TDS
14:52	7	0.6	14.32	4.5	6.3	10	239.1	0.637	-	40.7	No TDS

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (^{o}C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
14:52	7	3.1	14.32	4.5	6.3	10	239.1	0.637	-	40.7	0

Sample Type:	Existing MW	Sample Number:	V1-MW-107-01	Sample Equipment:	peristaltic and HDPE
Duplicate:	-			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:		Date:	-	By:	-
Discharge Water Dispostion:	55-gallon				
Comments:	-			Drum No.:	-
Prepared by:	Aaron Sutton				
Date Prepared:	03-Jun-2019				



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN		AOC:	1	Date:	06/30/2019		
Well ID:	V1-MW-107		Samplers:	Kylah Wyatt							
Purge Start Date:	06/30/2019		Time:	12:59	Purge End Date:	06/30/2019		Time:	13:15		
Weather:	Wind:	5 mph, N	Precipitation:	None		Sky:	Mostly Cloudy	Temperature °F:	78		
Well Labeled:	Yes		Well Secured:	Yes		Comments:	-				
PID SN:	592919025			Well Headspace (PID mu):		0		Odor:	none		
Water Level Instrument:	Solinst					Serial No.:	251927				
SWL beginning (BTOC):	13.23			WL After pump install (BTOC):		13.23		Max Drawdown (in.):	3.24		
Well Casing (inches):	2			Borehole diameter:		Unknown		Sandpack length (ft.):	Unknown		
Screen Length:	14.4 - 19.4			Parameters Measured With:		YSI 18h100703					
Water Column height (ft.):	6.17		Total Purge Volume (gallons):	0.6		Purge Method:	Low Flow				
Max Purge Rate mL/min.:	150		Sampling Flow Rate mL/min:	150							
Pump Type:	peristaltic		Pump Vol.:	0		Tubing Material:	HDPE				
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	23.4	Total Pump + Tubing + Flow Cell Vol.:	0.0504				
Well Casing Vol. (gallons):	3.16			Sandpack Vol. (gal.):	Unknown	Total Well Volume (gal.):	Unknown				
Depth of pump inlet (BTOC):	16.9			Rationale:	No construction info. Assume 5 ft screen.						

PURGE CYCLE

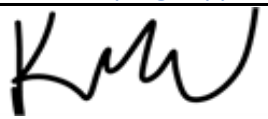
Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
12:59	0	0	-	-	-	-	-	-	-	-	-
13:02	3	0.1	13.42	11.7	8.19	6.93	-49.9	1.16	-	4.05	-
13:07	5	0.2	13.47	12.5	8.5	7.11	-51	1.17	-	1.7	-
13:10	3	0.1	13.5	12.7	8.4	6.9	-48.8	1.19	-	1.7	-
13:15	5	0.2	13.5	12.6	8.33	6.57	-46.5	1.19	-	1.67	-

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
13:15	5	0.6	13.5	12.6	8.33	6.57	-46.5	1.19	-	1.67	0

Sample Type:	Existing MW	Sample Number:	V1-MW-107-02	Sample Equipment:	peristaltic and HDPE
Duplicate:	-			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:	Date:	-	By:	-	Discharge Water Dispostion: dumped on
Comments:	Dedicated/ disposable equipment used. Total purge approx 1.25 gal			Drum No.:	-
Prepared by:	Kylah Wyatt				
Date Prepared:	30-Jun-2019				



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN	AOC:	1	Date:	06/10/2019			
Well ID:	V1-RFW2		Samplers:	Tom Horn, Dan Griffiths							
Purge Start Date:	06/10/2019		Time:	10:10	Purge End Date:	06/10/2019	Time:	11:03			
Weather:	Wind:	10 mph, S	Precipitation:	None	Sky:	Sunny	Temperature °F:	73			
Well Labeled:	Yes		Well Secured:	Yes	Comments:	-					
PID SN:	110-014083		Well Headspace (PID mu):		0		Odor:	none			
Water Level Instrument:	Heron				Serial No.:	3010-1078					
SWL beginning (BTOC):	8.52		WL After pump install (BTOC):		8.52		Max Drawdown (in.):	2.8			
Well Casing (inches):	2		Borehole diameter:		Unknown		Sandpack length (ft.):	Unknown			
Screen Length:	19.42 - 24.42		Parameters Measured With:		YSI 10E100237						
Water Column height (ft.):	15.9		Total Purge Volume (gallons):		6.6		Purge Method:	Low Flow			
Max Purge Rate mL/min.:	170		Sampling Flow Rate mL/min:		170						
Pump Type:	peristaltic		Pump Vol.:	0	Tubing Material:	HDPE					
Flow Cell Vol.:	0.05	Vol./ft.:	0	Total ft.:	Unknown	Total Pump + Tubing + Flow Cell Vol.:		Unknown			
Well Casing Vol. (gallons):	3.98		Sandpack Vol. (gal.):		Unknown	Total Well Volume (gal.):		Unknown			
Depth of pump inlet (BTOC):	21.92		Rationale:		Assume screen is 5 ft, set pump at middle of screen						

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
10:10	0	0	10.05	10.91	7.96	2.38	126.7	686.1	-	30	-
10:14	4	0.1	10.12	12.2	7.95	1.97	92.8	686	-	31.4	-
10:21	7	0.2	10.12	12.6	7.96	1.66	91	687	-	31.2	-
10:24	3	0.3	10.23	12.7	7.96	1.58	89.8	698	-	23.2	-
10:28	4	0.4	10.23	13.1	7.98	1.55	88.2	689	-	18.8	-
10:32	4	0.5	10.1	13.6	7.98	1.33	86.6	692	-	16	-
10:37	5	0.6	10.09	13.6	7.99	1.23	84.6	692	-	15	-
10:41	4	0.7	10.05	13.9	7.99	1.11	81.5	693	-	14.2	-
10:46	5	0.8	10	13.8	8	0.93	78.4	693	-	10.6	-
10:50	4	0.9	10	13.8	8	0.86	75.7	694	-	10.2	-
10:58	8	1	10	13.7	8	0.86	73.7	694	-	11.2	-
11:03	5	1.1	10	13.6	8	0.8	70.5	693	-	10.1	-

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
11:03	5	6.6	10	13.6	8	0.8	70.5	693	-	10.1	0

Sample Type:	Existing MW	Sample Number:	V1-RFW2-01	Sample Equipment:	peristaltic and HDPE
Duplicate:	V1-RFW2-91			MS/MSD:	-
Sample Filtered:	N	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:	Date:	-	By:	-	Discharge Water Dispostion: 55-gallon
Comments:	Dedicated equipment, no EB required.			Drum No.:	Tote 3
Prepared by:	Tom Horn				
Date Prepared:	10-Jun-2019				



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN		AOC:	1	Date:	07/10/2019		
Well ID:	V1-RFW2		Samplers:	Aaron Sutton							
Purge Start Date:	07/10/2019		Time:	15:52	Purge End Date:	07/10/2019		Time:	16:22		
Weather:	Wind:	0 mph, N	Precipitation:	None		Sky:	-		Temperature °F:	83	
Well Labeled:	No		Well Secured:	Yes		Comments:	-				
PID SN:	592-919025			Well Headspace (PID mu):		0			Odor:	none	
Water Level Instrument:	Heron					Serial No.:	16820				
SWL beginning (BTOC):	9.7			WL After pump install (BTOC):		9.7			Max Drawdown (in.):	21.7	
Well Casing (inches):	2			Borehole diameter:		Unknown			Sandpack length (ft.):	Unknown	
Screen Length:	11 - 21			Parameters Measured With:		YSI 16J101780					
Water Column height (ft.):	14.72		Total Purge Volume (gallons):		1.3			Purge Method:	Low Flow		
Max Purge Rate mL/min.:			205	Sampling Flow Rate mL/min:		205					
Pump Type:	peristaltic		Pump Vol.:	0				Tubing Material:	HDPE		
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	27	Total Pump + Tubing + Flow Cell Vol.:			0.0504		
Well Casing Vol. (gallons):	3.43			Sandpack Vol. (gal.):	Unknown	Total Well Volume (gal.):			Unknown		
Depth of pump inlet (BTOC):	16			Rationale:	Middle of screen						

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
15:52	0	0	10.43	12.3	7.8	0.98	-17.1	0.55	-	18.1	No TDS
15:57	5	0.3	11.38	12.2	7.92	0.62	-26.2	0.54	-	11.2	No TDS
16:02	5	0.2	11.74	12.1	7.92	0.53	-35.1	0.54	-	7.92	No TDS
16:07	5	0.2	12.06	12	7.9	0.41	-50.6	0.55	-	5.38	No TDS
16:12	5	0.2	12.11	12.3	7.95	0.32	-71.4	0.55	-	3.77	No TDS
16:17	5	0.2	12.24	12.2	7.97	0.26	-84.6	0.55	-	3.42	No TDS
16:22	5	0.2	12.18	12.4	7.94	0.25	-96.3	0.56	-	2.82	No TDS

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
16:22	5	0.2	12.18	12.4	7.94	0.25	-96.3	0.56	-	2.82	0

Sample Type:	Existing MW	Sample Number:	V1-RFW2-02	Sample Equipment:	peristaltic and HDPE		
Duplicate:	-			MS/MSD:	-		
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-		
Sample Equipment Decon:	Date:	-	By:	-	Discharge Water Dispostion:	dumped on	
Comments:	-				Drum No.:	-	
Prepared by:	Aaron Sutton						
Date Prepared:	17-Jul-2019						



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN	AOC:	2	Date:	06/14/2019			
Well ID:	V4-BR03		Samplers:	Aaron Sutton, Kylah Wyatt							
Purge Start Date:	06/14/2019		Time:	09:00	Purge End Date:	06/14/2019	Time:	09:45			
Weather:	Wind:	10 mph, N	Precipitation:	Mixed	Sky:	Sunny	Temperature °F:	65			
Well Labeled:	Yes		Well Secured:	Yes	Comments:	-					
PID SN:	-		Well Headspace (PID mu):		0		Odor:	none			
Water Level Instrument:	Heron				Serial No.:	16820					
SWL beginning (BTOC):	36.9		WL After pump install (BTOC):		36.7		Max Drawdown (in.):	35.64			
Well Casing (inches):	5		Borehole diameter:		Unknown		Sandpack length (ft.):	Unknown			
Screen Length:	111.5 - 116.5		Parameters Measured With:		YSI 17m100413/14k100940						
Water Column height (ft.):	81.68		Total Purge Volume (gallons):		2		Purge Method:	Low Flow			
Max Purge Rate mL/min.:	210		Sampling Flow Rate mL/min:		210						
Pump Type:	submersible		Pump Vol.:	50	Tubing Material:	HDPE					
Flow Cell Vol.:	270	Vol./ft.:	#####	Total ft.:	120	Total Pump + Tubing + Flow Cell Vol.:		774.25 mL			
Well Casing Vol. (gallons):	118.77		Sandpack Vol. (gal.):		Unknown	Total Well Volume (gal.):		Unknown			
Depth of pump inlet (BTOC):	114		Rationale:		Bentonite at bottom of the well, assume 5 ft screen as no well construction						

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
09:00	0	0	36.9	10.8	9.38	0.35	-97.7	0.176	-	34.6	No TDS
09:05	5	0.2	37.13	10.9	9.45	0.29	-169.4	0.176	-	26.8	No TDS
09:10	5	0.2	37.34	11.2	9.7	0.22	-307.3	0.175	-	24.6	No TDS
09:15	5	0.3	38.2	10.5	9.82	0.26	-277	0.176	-	23.7	No TDS
09:20	5	0.3	38.6	12.1	9.81	0.14	-477.9	0.184	-	22	No TDS
09:25	5	0.2	38.7	11.7	9.82	0.15	-500	0.179	-	23.4	No TDS
09:30	5	0.2	38.97	11.2	9.88	0.17	-500	0.177	-	23.8	No TDS
09:35	5	0.2	39.37	11.6	9.88	0.16	-500	0.178	-	23	No TDS
09:40	5	0.2	39.65	11.6	9.91	0.14	-500	0.178	-	21.7	No TDS
09:45	5	0.2	39.67	11.6	9.91	0.15	-500	0.18	-	21.9	No TDS

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
09:45	5	2	39.67	11.6	9.91	0.15		0.18	-	21.9	0

Sample Type:	Existing MW	Sample Number:	V4-BR03-01	Sample Equipment:	submersible and HDPE
Duplicate:	-			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	BRLTN-061419-EB
Sample Equipment Decon:	Date:	14-Jun-2019	By: Aaron Sutton	Discharge Water Dispostion:	55-gallon
Comments:	Final DtW: 40.40. EB collected between V4-BR03 and MW-414.			Drum No.:	Tote 3
Prepared by:	Aaron Sutton				
Date Prepared:	14-Jun-2019				

Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN	AOC:	2	Date:	7/9/2019			
Well ID:	V4-BR03		Samplers:	Dan Chamberland, Jessica click							
Purge Start Date:	07/09/2019		Time:	12:08	Purge End Date:	07/11/2019	Time:	17:15			
Weather:	Wind:	26 mph, W	Precipitation:	None	Sky:	Sunny	Temperature °F:	86			
Well Labeled:	Yes		Well Secured:	Yes	Comments:	-					
PID SN:	-		Well Headspace (PID mu):		-		Odor:	none			
Water Level Instrument:	Solinst				Serial No.:	251927					
SWL beginning (BTOC):	33.81		WL After pump install (BTOC):		33.66		Max Drawdown (in.):	134.88			
Well Casing (inches):	4		Borehole diameter:		6		Sandpack length (ft.):	Unknown			
Screen Length:	111.5 - 116.5		Parameters Measured With:		YSI						
Water Column height (ft.):	82.84		Total Purge Volume (gallons):		25.4		Purge Method:	Low Flow			
Max Purge Rate mL/min.:	500		Sampling Flow Rate mL/min:		500						
Pump Type:	submersible		Pump Vol.:	0.01	Tubing Material:	HDPE					
Flow Cell Vol.:	0.05	Vol./ft.: 0.01	Total ft.:	120.5	Total Pump + Tubing + Flow Cell Vol.:			0.062			
Well Casing Vol. (gallons):	19		Sandpack Vol. (gal.):	Unknown	Total Well Volume (gal.):			Unknown			
Depth of pump inlet (BTOC):	114		Rationale:		Found tubing in well premarked						

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
12:08	0	0.3	35	11.8	9.98	3.34	-67.8	0.151	-	16.1	-
12:13	5	0.7	35.35	12.2	10.07	2.01	-124.5	0.151	-	27.8	-
12:18	5	0.4	35.84	12	10.1	1.46	-146.8	0.152	-	18.5	-
12:23	5	0.5	36.33	12	10.13	1.06	-157.2	0.153	-	22.4	-
12:28	5	0.3	36.87	12.3	10.07	0.6	-174.8	0.152	-	22.8	-
12:34	6	0.5	37.39	11.8	10.2	0.64	-184.4	0.15	-	19.8	Pump stopping periodically. Flow rate changes. Water level dropping.

Low-Flow Groundwater Purge And Sample Log

12:39	5	0.7	38.18	11.4	10.07	0.51	-201.8	0.149	-	22.7	Purge rates fluctuations with pump
12:44	5	0.7	39.12	11.3	10.16	0.41	-213.3	0.149	-	23.3	-
12:49	5	0.4	39.84	11.8	10.18	0.4	-219.7	0.151	-	21.4	-
12:55	6	0.4	40.58	12.3	10.18	0.34	-194.4	0.152	-	23.6	-
13:00	5	0.2	40.88	13.1	10.2	0.3	-219.9	0.154	-	20.6	-
13:05	5	0	41.01	14	10.14	0.27	-213.1	0.16	-	22.1	-
13:10	5	0.1	41.32	13.8	10.19	0.23	-199.3	0.15	-	27.8	-
13:15	5	0.1	41.41	13	10.17	0.17	-214.9	0.154	-	22.4	-
13:20	5	0.1	42.11	12.2	10.17	0.14	-216	0.152	-	20.7	-
13:25	5	0.1	42.25	12.5	10.17	0.14	-221.7	0.154	-	21.5	-
13:30	5	0.1	42.62	13.1	10.18	0.12	-222.2	0.155	-	23	-
13:35	4	0.2	42.97	11.5	10.18	0.11	-225.6	0.15	-	22.6	-
13:40	5	0.3	43.4	12.3	10.18	0.11	-231.9	0.152	-	22.1	-
13:45	5	0.3	43.79	13.3	10.23	0.11	-230.7	0.155	-	22.1	-
13:50	5	0.2	44.17	12.2	10.23	0.13	-192.7	0.153	-	21.2	-
13:55	5	0.3	44.42	11.9	10.17	0.12	-204.2	0.153	-	21.3	-
14:00	5	0.3	44.63	12.5	10.17	0.1	-212.8	0.152	-	24.5	-
14:05	5	0.3	44.9	12.7	10.19	0.12	-221.3	0.153	-	23.1	-

Low-Flow Groundwater Purge And Sample Log

14:10	5	0	-	-	-	-	-	-	-	-	continued drawdown we will increase the flow rate and pump the well dry to sample at a later date. Well pumped dry on 07/10 starting at 11:00. Purge complete at 12:45, wl:
17:05	175	17.3	81.37	11.5	9.59	2.85	23	0.153	-	28.9	Collect three readings then sample after letting well recover.
17:08	3	0.3	81.77	11.4	9.79	1.07	13.9	0.152	-	29.1	-
17:15	7	0.3	82.15	11.6	9.83	0.61	4.8	0.153	-	31.9	-

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
17:15	7	0.3	82.15	11.6	9.83	0.61	4.8	0.153	-	31.9	0

Sample Type:	Existing MW	Sample Number:	V4-BR03-02	Sample Equipment:	submersible and HDPE
Duplicate:	-			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:	Date:	11-Jul-2019	By: Dan Chamberland	Discharge Water Dispostion:	dumped on
Comments:	Well sampled after purging dry and then allowing to recharge			Drum No.:	-
Prepared by:	Dan Chamberland				
Date Prepared:	11-Jul-19				

Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN	AOC:	2	Date:	06/11/2019			
Well ID:	V4-MW-5		Samplers:	Dan Chamberland							
Purge Start Date:	06/12/2019		Time:	16:10	Purge End Date:	06/12/2019	Time:	17:38			
Weather:	Wind:	10 mph, W	Precipitation:	None	Sky:	Partly Cloudy	Temperature °F:	65			
Well Labeled:	No		Well Secured:	Yes	Comments:	-					
PID SN:	110-014589		Well Headspace (PID mu):		0.1		Odor:	none			
Water Level Instrument:	Heron				Serial No.:	3010-1078					
SWL beginning (BTOC):	28.78		WL After pump install (BTOC):		28.78		Max Drawdown (in.):	2.9			
Well Casing (inches):	2		Borehole diameter:		Unknown		Sandpack length (ft.):	Unknown			
Screen Length:	42.15 - 47.15		Parameters Measured With:		YSI 10E100237						
Water Column height (ft.):	18.37		Total Purge Volume (gallons):		6.5		Purge Method:	Low Flow			
Max Purge Rate mL/min.:	250		Sampling Flow Rate mL/min:		200						
Pump Type:	submersible		Pump Vol.:	-	Tubing Material:	HDPE					
Flow Cell Vol.:	0.06	Vol./ft.:	0.01	Total ft.:	48	Total Pump + Tubing + Flow Cell Vol.:		Unknown			
Well Casing Vol. (gallons):	7.69		Sandpack Vol. (gal.):		Unknown	Total Well Volume (gal.):		Unknown			
Depth of pump inlet (BTOC):	44.65		Rationale:		2.5 feet off of thebottom						

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
16:10	0	0	28.75	14.4	7.83	1.33	28	0.72	-	356	No tds
16:15	5	0.3	28.99	12.6	7.96	1.16	22	0.7	-	324	-
16:20	5	0.5	28.89	12.2	7.98	1.22	16.7	0.72	-	337	-
16:25	5	0.7	28.85	12.3	8.04	1.28	25	0.73	-	260	-
16:30	5	1	28.81	13.2	7.96	1.3	31.7	0.75	-	179	No TDS
16:35	5	1.2	28.85	12.2	7.96	1.3	36.6	0.741	-	148	-
16:40	5	1.5	28.85	12.5	7.97	1.37	42.9	0.75	-	100	-
16:45	5	1.7	28.87	12.2	7.92	1.37	42.8	0.74	-	104	-
16:50	5	2	28.88	12	7.96	1.26	42.1	0.75	-	61.2	-
16:55	5	2.2	28.86	12.1	7.97	1.2	43.7	0.76	-	32.6	-
17:00	5	2.5	28.86	12.3	7.97	1.2	43.8	0.76	-	23.9	-
17:05	5	2.7	28.86	12.2	7.96	1.19	44.8	0.77	-	19.6	-
17:10	5	3	28.86	12.1	7.89	1.19	45	0.77	-	16.2	-

Low-Flow Groundwater Purge And Sample Log

17:15	5	3.2	28.87	12.1	7.95	1.22	46.1	0.77	-	11.6	-
17:20	5	3.5	28.86	12.1	7.97	1.25	48.1	0.78	-	7.79	-
17:25	5	3.8	28.86	12.2	7.9	1.23	48.2	0.78	-	7.53	-
17:30	5	4	28.87	12.3	7.98	1.21	48.2	0.78	-	7.68	-

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
17:30	5	4	28.87	12.3	7.98	1.21	48.2	0.78	-	7.68	-

Sample Type:	Existing MW	Sample Number:	V4-MW-5-01	Sample Equipment:	submersible and HDPE
Duplicate:	-			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	EB-V4-MW-5-01
Sample Equipment Decon:		Date:	11-Jun-2019	By:	Dan Chamberland
Discharge Water Dispostion:	-				
Comments:	Water discharged to onsite tote.			Drum No.:	-
Prepared by:	Dan Chamberland				
Date Prepared:	12-Jun-2019				



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN		AOC:	2	Date:	06/30/2019		
Well ID:	V4-MW-5		Samplers:	Kylah Wyatt							
Purge Start Date:	06/30/2019		Time:	15:20	Purge End Date:		06/30/2019	Time:	15:51		
Weather:	Wind:	5 mph, N	Precipitation:	Rain		Sky:	Sunny		Temperature °F:	78	
Well Labeled:	Yes		Well Secured:	Yes		Comments:	-				
PID SN:	592919025			Well Headspace (PID mu):			0		Odor:	none	
Water Level Instrument:		Solinst					Serial No.:		251927		
SWL beginning (BTOC):		29.75		WL After pump install (BTOC):			29.75		Max Drawdown (in.):	0.96	
Well Casing (inches):		2			Borehole diameter:		Unknown		Sandpack length (ft.):	Unknown	
Screen Length:	42.15 - 47.15				Parameters Measured With:			YSI 18h100703			
Water Column height (ft.):		17.4	Total Purge Volume (gallons):			1		Purge Method:		Low Flow	
Max Purge Rate mL/min.:			120		Sampling Flow Rate mL/min:			120			
Pump Type:	peristaltic		Pump Vol.:		0			Tubing Material:		HDPE	
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	51.15		Total Pump + Tubing + Flow Cell Vol.:			0.0508	
Well Casing Vol. (gallons):		7.69		Sandpack Vol. (gal.):		Unknown		Total Well Volume (gal.):		Unknown	
Depth of pump inlet (BTOC):		44.65		Rationale:			No construction info. Assume 5 ft screen.				

PURGE CYCLE

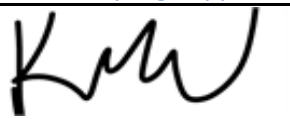
Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
15:20	0	0	-	-	-	-	-	-	-	-	-
15:28	8	0.3	29.8	14.9	9.85	1.44	-180.7	0.72	-	38.3	-
15:31	3	0.1	29.82	15.2	9.83	1	-195.1	0.75	-	28.1	-
15:34	3	0.1	29.82	13.8	9.63	0.75	-204.4	0.73	-	26.8	-
15:37	3	0	29.83	13.9	9.7	0.64	-200.2	0.76	-	21.6	-
15:42	5	0.2	29.82	14	9.45	0.64	-188.5	0.77	-	15.8	-
15:45	3	0.1	29.82	14.2	9.3	0.66	-184.9	0.78	-	15.3	-
15:48	3	0.1	29.83	13.9	9.41	0.7	-180	0.78	-	14.8	-
15:51	3	0.1	29.83	13.8	9.29	0.68	-176.7	0.77	-	13.9	-

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
15:51	3	1	29.83	13.8	9.29	0.68	-176.7	0.77	-	13.9	0

Sample Type:	Existing MW	Sample Number:	V4-MW-5-02	Sample Equipment:	peristaltic and HDPE
Duplicate:	-			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:	Date:	-	By:	-	Discharge Water Dispostion: dumped on
Comments:	Dedicated/ disposable equipment used. Total purge approx 1.25 gal			Drum No.:	-
Prepared by:	Kylah Wyatt				
Date Prepared:	30-Jun-2019				



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN	AOC:	2	Date:	06/03/2019			
Well ID:	V4-MW413		Samplers	Aaron Sutton, Kylah Wyatt							
Purge Start Date:	06/03/2019		Time:	09:23	Purge End Date:	06/03/2019	Time:	11:06			
Weather:	Wind:	8 mph, NW	Precipitation:	None	Sky:	Sunny	Temperature °F:	58			
Well Labeled:	Yes		Well Secured:	Yes	Comments:	Teflon tape in threaded well cap. Removed tape prior to					
PID SN:	-		Well Headspace (PID mu):		-		Odor:	none			
Water Level Instrument:	Heron				Serial No.:	16820					
SWL beginning (BTOC):	16.98		WL After pump install (BTOC):		16.98		Max Drawdown (in.):	1.44			
Well Casing (inches):	2		Borehole diameter:		Unknown		Sandpack length (ft.):	Unknown			
Screen Length:	-		Parameters Measured With:		YSI						
Water Column height (ft.):	24.57		Total Purge Volume (gallons):		955		Purge Method:	Low Flow			
Max Purge Rate L/min.:			200	Sampling Flow Rate mL/min:			200				
Pump Type:	peristaltic		Pump Vol.:		0		Tubing Material:	HDPE			
Flow Cell Vol.:	203	Vol./ft.:	17.84	Total ft.:	45	Total Pump + Tubing + Flow Cell Vol.:		1005.8			
Well Casing Vol. (gallons):	4.01		Sandpack Vol. (gal.):		Unknown	Total Well Volume (gal.):		Unknown			
Depth of pump inlet (BTOC):	39		Rationale:		Assume 5ft screen since no construction info available						

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
09:23	0	0	17.1	7.2	6.82	8.23	172.8	0.671	-	10.6	No TDS
09:33	10	0.528346	17.1	7.1	7.01	7.65	164.1	0.66	-	12.6	No TDS
09:38	5	0.264173	17.1	7.1	7.08	7.64	154	0.675	-	6.09	Conductivity,
09:44	6	0.332858	17.1	7.2	7.26	7.36	147.3	0.658	-	7.04	No TDS
09:48	4	0.211338	17.1	7.1	7.22	7.36	142.6	0.65	-	9.83	-
09:54	6	0.332858	17.1	7.1	7.42	7.22	138.4	0.648	-	9.37	-
09:59	5	0.277382	17.1	7.3	7.47	7.07	134.6	0.651	-	6.75	-
10:04	5	0.277382	17.1	7.2	7.63	7.13	134.7	0.648	-	3.93	-
10:08	4	0.211338	17.1	7.1	7.66	7.03	127.8	0.642	-	16.1	No TDS
10:14	6	0.317007	17.1	6.9	7.72	6.92	127.9	0.644	-	3.68	-
10:19	5	0.303799	17.1	7.2	7.63	6.74	126.5	0.637	-	5.25	-
10:23	4	0.211338	17.1	7.4	7.75	6.78	126.6	0.64	-	12.8	No TDS
10:29	6	0.317007	17.1	7.1	7.62	6.75	123.4	0.64	-	4.47	No TDS

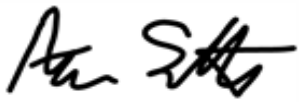
Low-Flow Groundwater Purge And Sample Log

10:34	5	0.264173	17.1	7.2	7.68	6.62	122.1	0.63	-	5.37	-
10:39	5	0.264173	17.1	7.4	7.79	6.52	120.3	0.638	-	4.01	-
10:45	6	0.317007	17.1	7.3	7.82	6.83	118.1	0.625	-	4.79	No TDS
10:48	3	0.158504	17.1	7.3	7.82	6.72	118.9	0.635	-	4.46	No TDS
11:06	18	0.951022	17.1	7.5	7.94	6.55	117.9	0.63	-	4.13	No TDS

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
11:06	18	5.539705	17.1	7.5	7.94	6.55	117.9	0.63	-	4.13	0

Sample Type:	Existing MW	Sample Number:	V4-MW413-01	Sample Equipment:	peristaltic and HDPE
Duplicate:	-			MS/MSD:	MS/MSD--00
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:		Date:	-	By:	-
Discharge Water Dispostion:	55-gallon				
Comments:	-			Drum No.:	-
Prepared by:	Aaron Sutton				
Date Prepared:	03-Jun-2019				



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001	Site:	BRLTN	AOC:	2	Date:	06/30/2019				
Well ID:	V4-MW413	Samplers:	Kylah Wyatt								
Purge Start Date:	06/30/2019	Time:	14:15	Purge End Date:	06/30/2019	Time:	14:30				
Weather:	Wind:	5 mph, N	Precipitation:	None	Sky:	Mostly Cloudy	Temperature °F:	78			
Well Labeled:	Yes	Well Secured:	Yes	Comments:	-						
PID SN:	592919025	Well Headspace (PID mu):		0	Odor:	none					
Water Level Instrument:	Solinst			Serial No.:	251927						
SWL beginning (BTOC):	16.8	WL After pump install (BTOC):		16.8	Max Drawdown (in.):	0.48					
Well Casing (inches):	2	Borehole diameter:		Unknown	Sandpack length (ft.):	Unknown					
Screen Length:	36.56 - 41.56	Parameters Measured With:		YSI 18h100703							
Water Column height (ft.):	24.76	Total Purge Volume (gallons):		0.5	Purge Method:	Low Flow					
Max Purge Rate mL/min.:	128	Sampling Flow Rate mL/min:		128							
Pump Type:	peristaltic	Pump Vol.:	0	Tubing Material:	HDPE						
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	45.56	Total Pump + Tubing + Flow Cell Vol.:	0.0507				
Well Casing Vol. (gallons):	6.78	Sandpack Vol. (gal.):	Unknown	Total Well Volume (gal.):	Unknown						
Depth of pump inlet (BTOC):	39.06	Rationale:	No construction info. Assume 5 ft screen.								

PURGE CYCLE

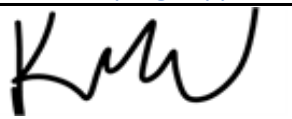
Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
14:15	0	0	-	-	-	-	-	-	-	-	-
14:19	4	0.1	16.84	13.8	8.89	3.62	-113.2	0.81	-	4.71	-
14:22	3	0.1	16.82	13.6	9.16	3.08	-119	0.81	-	4.47	-
14:25	3	0.1	16.82	13.5	9.25	2.92	-122.5	0.82	-	4.65	-
14:30	5	0.2	16.82	13.8	9.43	2.85	-125.7	0.82	-	4.73	-

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
14:30	5	0.5	16.82	13.8	9.43	2.85	-125.7	0.82	-	4.73	0

Sample Type:	Existing MW	Sample Number:	V4-MW413-02	Sample Equipment:	peristaltic and HDPE
Duplicate:	-			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:	Date:	-	By:	-	Discharge Water Dispostion: dumped on
Comments:	Dedicated/ disposable equipment used. Total purge approx 1.25 gal			Drum No.:	-
Prepared by:	Kylah Wyatt				
Date Prepared:	30-Jun-2019				



Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN		AOC:	2	Date:	06/14/2019		
Well ID:	V4-MW414		Samplers:	Aaron Sutton							
Purge Start Date:	06/14/2019		Time:	11:27	Purge End Date:		06/14/2019	Time:	13:22		
Weather:	Wind:	5 mph, E	Precipitation:	Rain		Sky:	Mostly Cloudy	Temperature °F:	65		
Well Labeled:	Yes		Well Secured:	Yes		Comments:	Label faded				
PID SN:	-			Well Headspace (PID mu):			-	Odor:	none		
Water Level Instrument:		Heron				Serial No.:		16820			
SWL beginning (BTOC):		43.2		WL After pump install (BTOC):			42.64	Max Drawdown (in.):	213.2		
Well Casing (inches):		2			Borehole diameter:		Unknown	Sandpack length (ft.):	Unknown		
Screen Length:	65.5 - 70.5				Parameters Measured With:		YSI 14K100940				
Water Column height (ft.):		27.3	Total Purge Volume (gallons):			14		Purge Method:	Low Flow		
Max Purge Rate mL/min.:			1600		Sampling Flow Rate mL/min:		130				
Pump Type:	submersible		Pump Vol.:		0.01			Tubing Material:	HDPE		
Flow Cell Vol.:	0.05	Vol./ft.:	0.01	Total ft.:	71	Total Pump + Tubing + Flow Cell Vol.:			0.061		
Well Casing Vol. (gallons):		11.5		Sandpack Vol. (gal.):	Unknown	Total Well Volume (gal.):			Unknown		
Depth of pump inlet (BTOC):		68		Rationale:	Middle of screen						

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments
11:27	0	0	44.4	11.1	8.7	4.78	197.1	0.2	-	999999	No TDS
11:32	5	0.3	45.23	12	8.03	3.86	228	0.203	-	979	No TDS
11:37	5	0.4	46.28	12.1	8.15	4.17	218.8	0.204	-	854	No TDS
11:42	5	0	47.4	12.1	8.27	4.72	215.5	0.206	-	605	No TDS
11:47	5	0.4	48.1	12.3	8.28	4.96	214.5	0.206	-	352	No TDS
11:52	5	0.7	49.5	12.2	8.3	5.36	209.3	0.206	-	190	No TDS
11:57	5	0.3	50.65	12.2	8.34	5.05	206.6	0.206	-	117	No TDS
12:02	5	0.2	51.33	12.6	8.34	4.89	192.8	0.209	-	128	No TDS
12:07	5	0.2	51.76	12.3	8.34	4.91	178.6	0.207	-	125	No TDS
12:12	5	0.2	52.29	12.6	8.35	4.9	170.2	0.21	-	109	No TDS
12:17	5	0.2	52.88	13.3	8.35	4.52	168.3	0.214	-	91.2	No TDS
12:25	8	0.5	54.04	13	8.37	4.93	173.9	0.211	-	79.6	No TDS
12:30	5	1.7	56.1	12	8.34	5.43	185.6	0.205	-	50.8	No TDS
12:35	5	1.7	58.97	11.9	8.33	5.78	189.8	0.208	-	45.1	No TDS

Low-Flow Groundwater Purge And Sample Log

12:40	5	1.6	60.18	11.5	8.3	5.92	207.9	0.212	-	43.4	No TDS
12:45	5	1.6	60.68	11.4	8.2	5.82	222	0.22	-	68.4	No TDS
12:50	5	2.1	61.21	11.3	8.24	4.84	217.7	0.221	-	78.4	No TDS
12:55	5	0	61.77	12.7	8.3	3.74	204.2	0.223	-	112	No TDS
13:04	9	1	61.98	13.7	8.35	3.04	180	0.227	-	123	No TDS
13:07	3	0.2	61.99	13.2	8.35	2.92	183.6	0.223	-	95.9	No TDS
13:10	3	0.2	62.01	13.6	8.35	2.72	183.7	0.224	-	87.2	No TDS
13:13	3	0.1	62.03	14.2	8.36	2.64	183.9	0.227	-	84.4	No TDS
13:16	3	0.1	62.08	13.8	8.36	2.37	183.7	0.225	-	91	No TDS
13:19	3	0.2	62.12	13.5	8.37	2.41	182.7	0.224	-	89.8	No TDS
13:22	3	0.1	62.17	13.7	8.37	2.29	181.4	0.227	-	95.8	No TDS

Low-Flow Groundwater Purge And Sample Log

SAMPLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
13:22	3	14	62.17	13.7	8.37	2.29	181.4	0.227	-	95.8	0

Sample Type:	Existing MW	Sample Number:	V4-MW414-01	Sample Equipment:	submersible and HDPE
Duplicate:	-			MS/MSD:	-
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	BRLTN-061419-EB
Sample Equipment Decon:	Date:	14-Jun-2019	By: Kylah Wyatt	Discharge Water Dispostion:	55-gallon
Comments:	EB also associated with V4-BR03-01. EB collected after V4-BR03, and before V4-MW414.			Drum No.:	Tote #3
Prepared by:	Kylah Wyatt				
Date Prepared:	14-Jun-2019	KMW			

Low-Flow Groundwater Purge And Sample Log

Project No.:	30001		Site:	BRLTN	AOC:	1	Date:	06/11/2019			
Well ID:	WELL 59 (BELTER		Samplers:	Kylah Wyatt							
Purge Start Date:	06/11/2019		Time:	13:30	Purge End Date:	06/11/2019	Time:	13:30			
Weather:	Wind:	5 mph, NW	Precipitation:	None	Sky:	Mostly Cloudy	Temperature °F:	65			
Well Labeled:	No		Well Secured:	No	Comments:	Sampled influent from spigot prior to GAC treatment at					
PID SN:	-		Well Headspace (PID mu):		-		Odor:	-			
Water Level Instrument:	-				Serial No.:	-					
SWL beginning (BTOC):	-		WL After pump install (BTOC):		-		Max Drawdown (in.):	-			
Well Casing (inches):	-		Borehole diameter:		-		Sandpack length (ft.):	-			
Screen Length:	-		Parameters Measured With:		-						
Water Column height (ft.):	-		Total Purge Volume (gallons):		-		Purge Method:	-			
Max Purge Rate mL/min.:			-		Sampling Flow Rate mL/min:		-				
Pump Type:	-		Pump Vol.:		-		Tubing Material:	-			
Flow Cell Vol.:	-	Vol./ft.:	-	Total ft.:	-	Total Pump + Tubing + Flow Cell Vol.:		-			
Well Casing Vol. (gallons):	-		Sandpack Vol. (gal.):		-	Total Well Volume (gal.):		-			
Depth of pump inlet (BTOC):	-		Rationale:		-						

PURGE CYCLE

Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	Comments

Low-Flow Groundwater Purge And Sample Log

SAMPLE

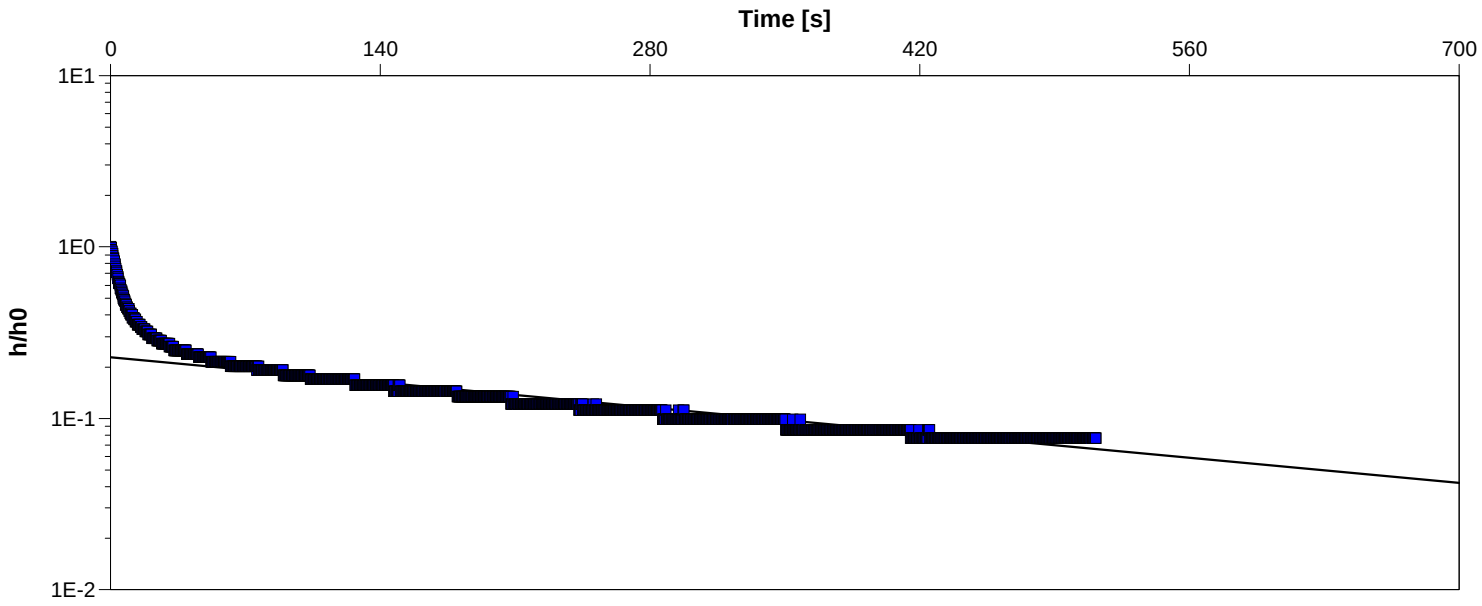
Actual Time	Elapsed Time	Volume Purged (gals)	Depth to Water (ft)	Temp (°C)	pH	DO	ORP mV	Conductivity (mmhos/cm)	TDS ppm	Turbidity (NTU)	VOC Collection Flow Rate
13:33	-	-	-	-	-	-	-	-	-	-	-

Sample Type:	Existing MW	Sample Number:	WELL 59-01	Sample Equipment:	-
Duplicate:	WELL 59-91			MS/MSD:	
Sample Filtered:	No	Filter Type/Size:	-	Equipment Rinsate Sample No.:	-
Sample Equipment Decon:		Date:	-	By:	-
Discharge Water Dispostion:	-				
Comments:	Sampled influent from spigot prior to GAC treatment at Belter farm. No parameters collected. Field dup collected. 13:30 sample time.			Drum No.:	-
Prepared by:	Kylah Wyatt				
Date Prepared:	11-Jun-2019				



APPENDIX G Slug Test Results

PARSONS **Burlington ANGB PFAS ESI South Burlington, VT**	**Slug Test Analysis Report**	
	Project: ANG PFAS ESI	
	Number: Burlington ANGB	
	Client: ANG	
Location: Burlington, VT	Slug Test: AASF06-MW03S	Test Well: AASF06-MW03S
Test Conducted by: Parsons		Test Date: 7/15/2019
Analysis Performed by:	New analysis 1	Analysis Date: 9/23/2019
Aquifer Thickness: 10.00 ft		

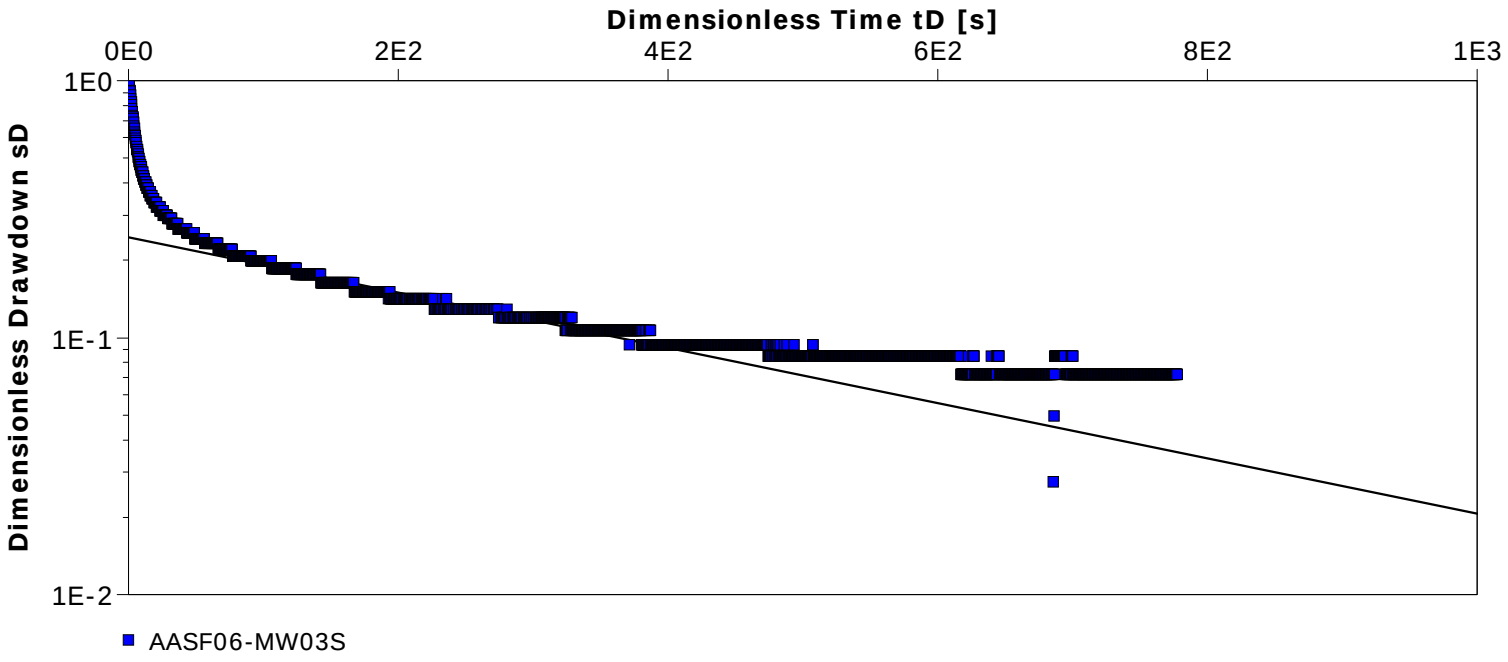


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [cm/s]	
AASF06-MW03S	8.58×10^{-5}	

PARSONS **Burlington ANGB PFAS ESI South Burlington, VT**	**Slug Test Analysis Report**	
	Project: ANG PFAS ESI	
	Number: Burlington ANGB	
	Client: ANG	

Location: Burlington, VT	Slug Test: AASF06-MW03S	Test Well: AASF06-MW03S
Test Conducted by: Parsons		Test Date: 7/15/2019
Analysis Performed by:	New analysis 1	Analysis Date: 9/23/2019
Aquifer Thickness: 10.00 ft		

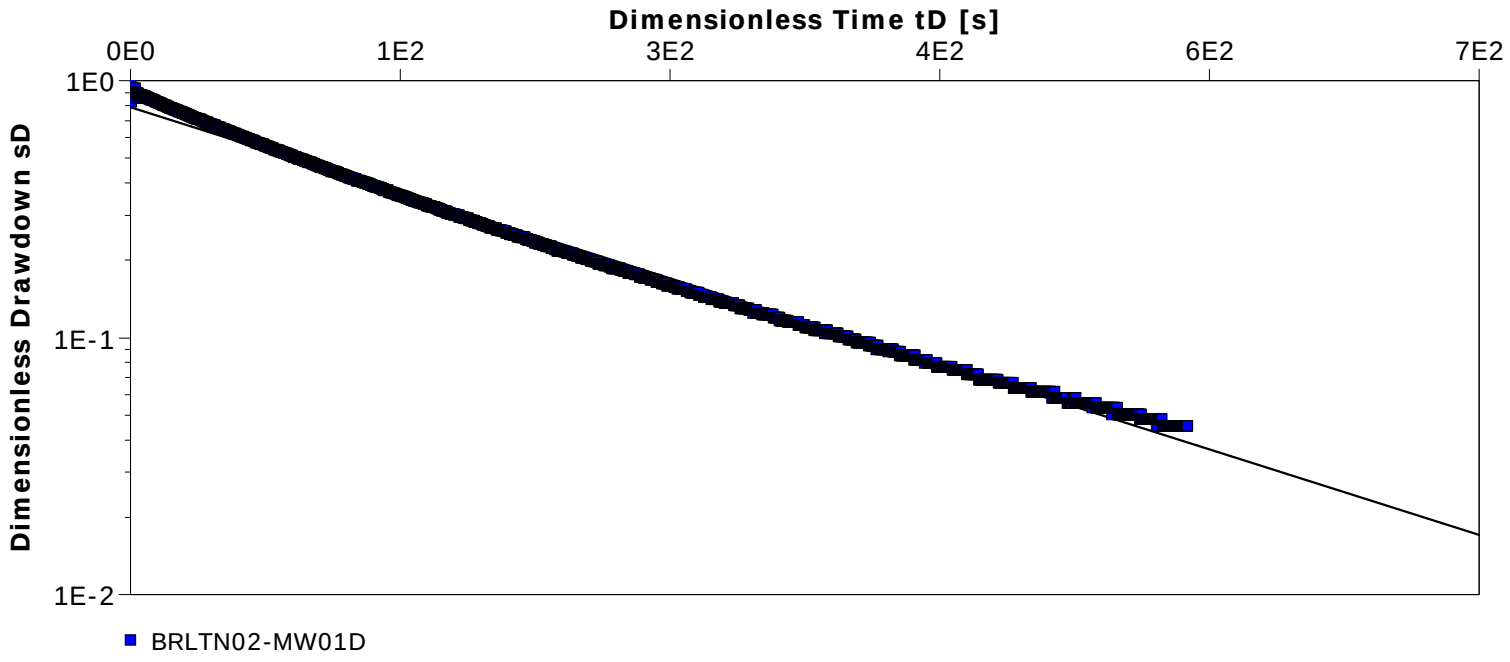


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [cm/s]	
AASF06-MW03S	8.79×10^{-5}	

PARSONS **Burlington ANGB PFAS ESI South Burlington, VT**	**Slug Test Analysis Report**	
	Project: ANG PFAS ESI	
	Number: Burlington ANGB	
	Client: ANG	

Location: Burlington, VT	Slug Test: BRLTN02-MW01D	Test Well: BRLTN02-MW01D
Test Conducted by: Parsons		Test Date: 7/14/2019
Analysis Performed by:	New analysis 1	Analysis Date: 9/23/2019
Aquifer Thickness: 40.00 ft		

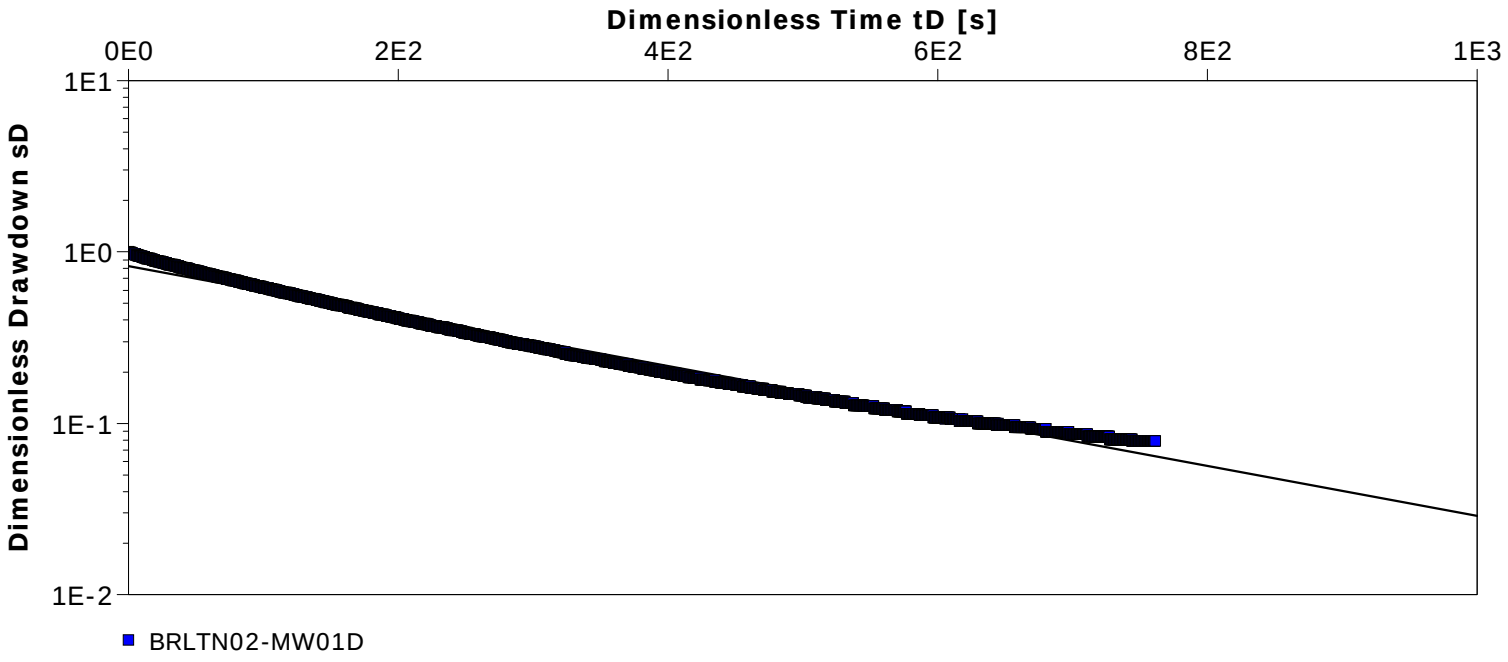


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [cm/s]	
BRLTN02-MW01D	3.66×10^{-4}	

Burlington ANGB **PFAS ESI** **South Burlington, VT**	**Slug Test Analysis Report**
PARSONS	Project: ANG PFAS ESI
	Number: Burlington ANGB
	Client: ANG

Location: Burlington, VT	Slug Test: BRLTN02-MW01D	Test Well: BRLTN02-MW01D
Test Conducted by: Parsons		Test Date: 7/14/2019
Analysis Performed by:	New analysis 1	Analysis Date: 9/23/2019
Aquifer Thickness: 40.00 ft		

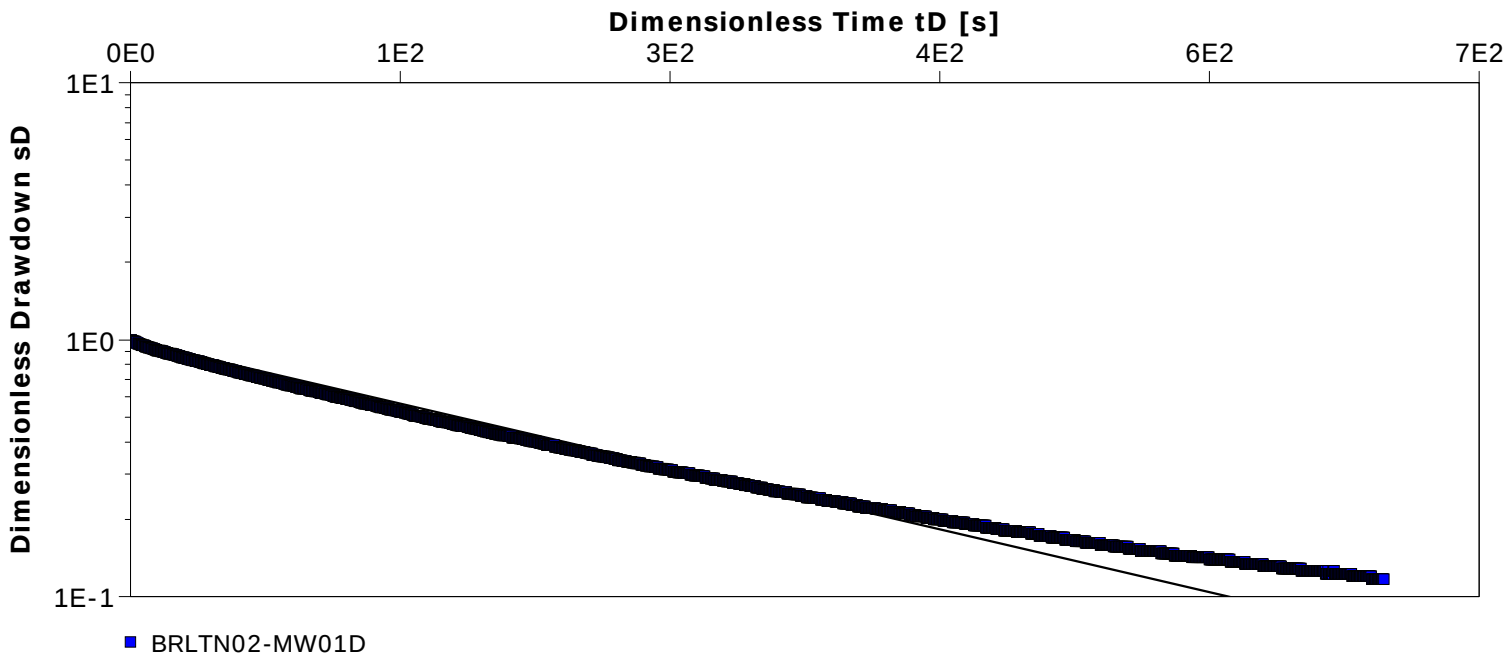


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [cm/s]	
BRLTN02-MW01D	2.24×10^{-4}	

PARSONS **Burlington ANGB PFAS ESI South Burlington, VT**	**Slug Test Analysis Report**	
	Project: ANG PFAS ESI	
	Number: Burlington ANGB	
	Client: ANG	

Location: Burlington, VT	Slug Test: BRLTN02-MW01D	Test Well: BRLTN02-MW01D
Test Conducted by: Parsons		Test Date: 7/14/2019
Analysis Performed by:	New analysis 1	Analysis Date: 9/23/2019
Aquifer Thickness: 40.00 ft		

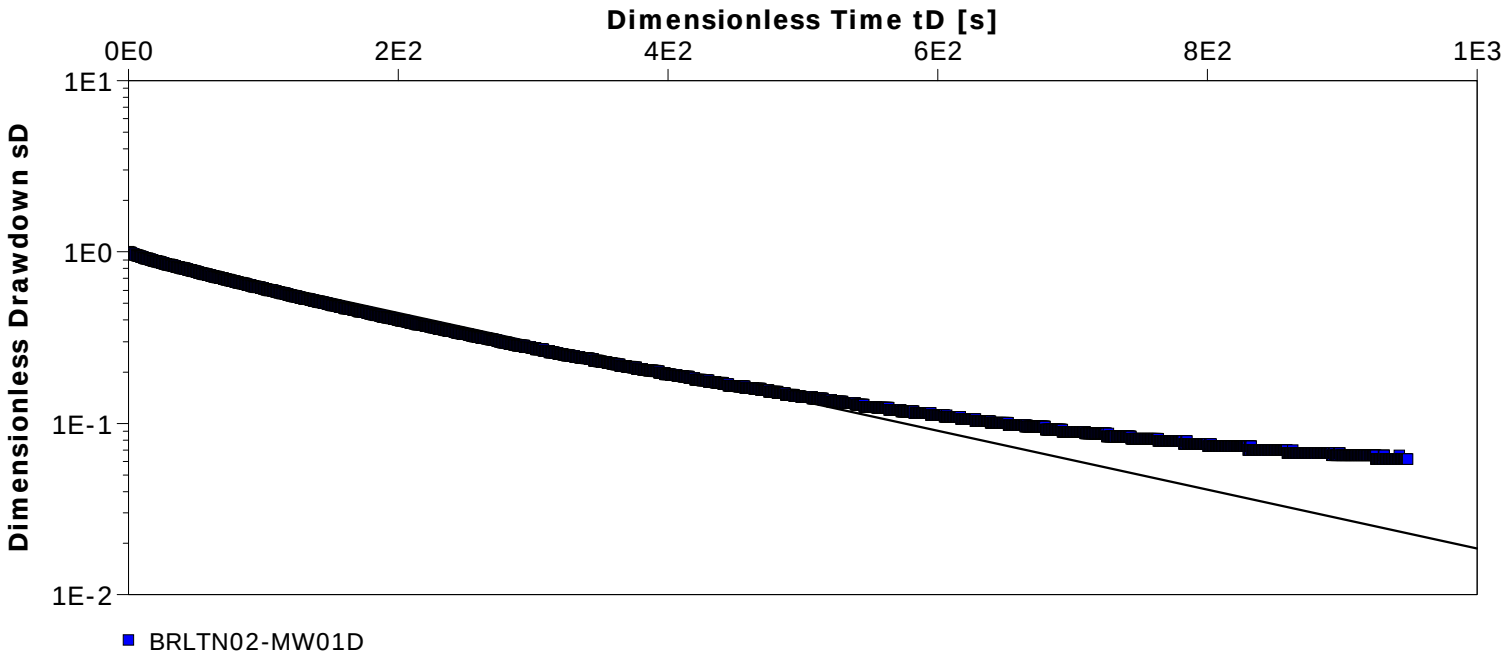


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [cm/s]	
BRLTN02-MW01D	2.68×10^{-4}	

PARSONS **Burlington ANGB PFAS ESI South Burlington, VT**	**Slug Test Analysis Report**	
	Project: ANG PFAS ESI	
	Number: Burlington ANGB	
	Client: ANG	

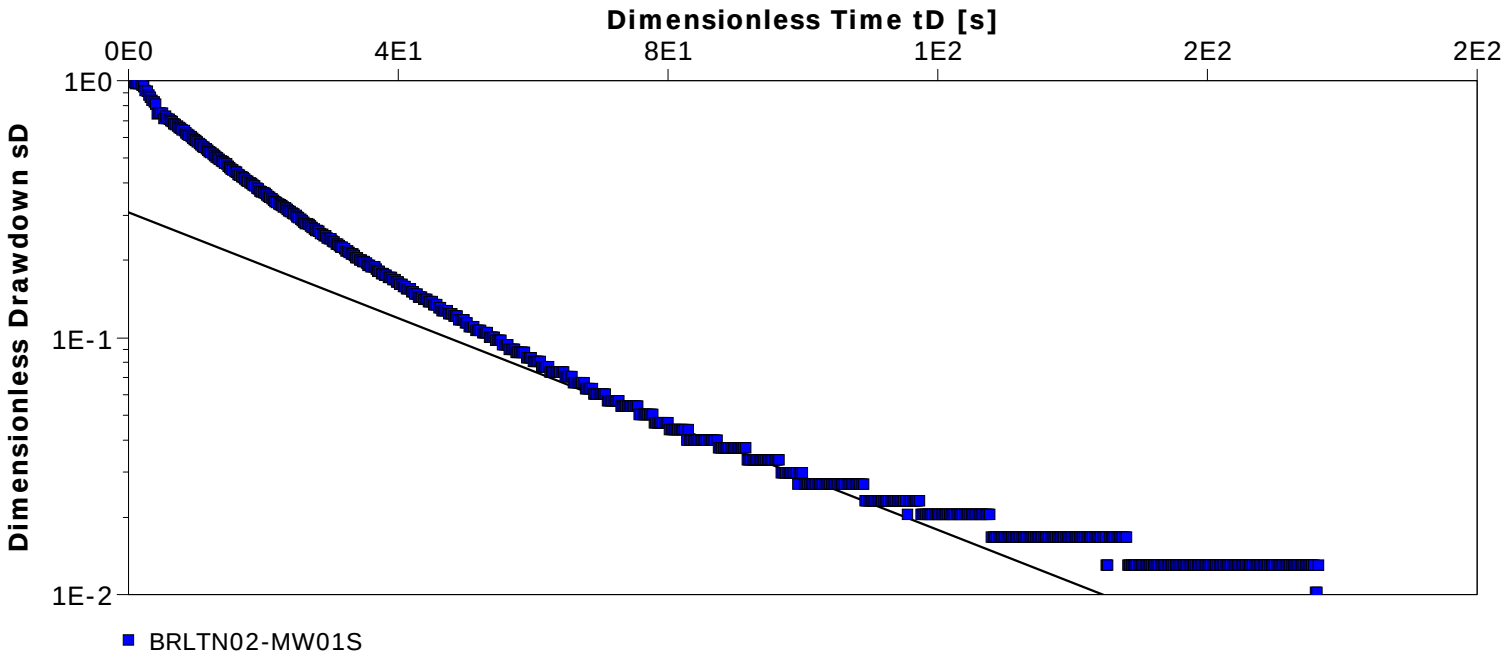
Location: Burlington, VT	Slug Test: BRLTN02-MW01D	Test Well: BRLTN02-MW01D
Test Conducted by: Parsons		Test Date: 7/14/2019
Analysis Performed by:	New analysis 1	Analysis Date: 9/23/2019
Aquifer Thickness: 40.00 ft		



Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [cm/s]	
BRLTN02-MW01D	2.65×10^{-4}	

PARSONS **Burlington ANGB PFAS ESI South Burlington, VT**	**Slug Test Analysis Report**	
	Project: ANG PFAS ESI	
	Number: Burlington ANGB	
	Client: ANG	
Location: Burlington, VT	Slug Test: BRLTN02-MW01S	Test Well: BRLTN02-MW01S
Test Conducted by: Parsons		Test Date: 7/14/2019
Analysis Performed by:	New analysis 1	Analysis Date: 9/23/2019
Aquifer Thickness: 40.00 ft		

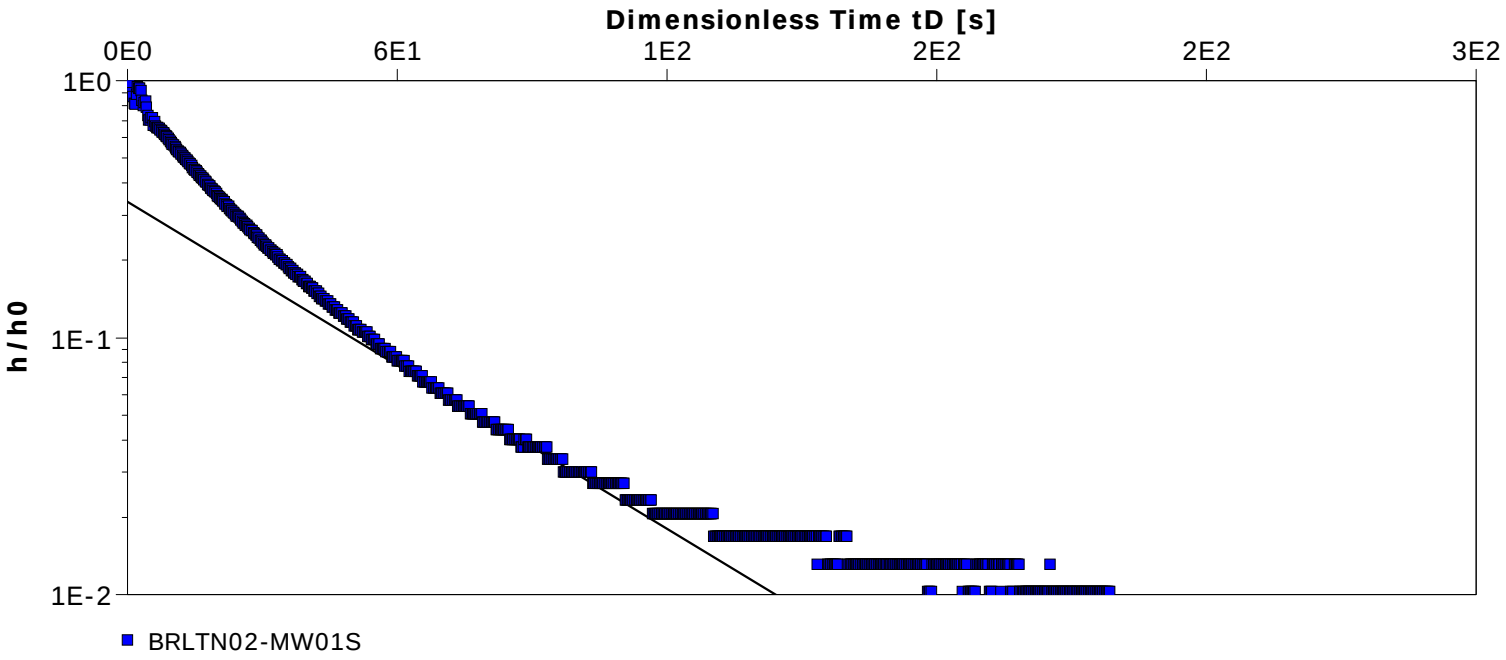


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [cm/s]	
BRLTN02-MW01S	9.33×10^{-4}	

Burlington ANGB **PFAS ESI** **South Burlington, VT**	**Slug Test Analysis Report**
PARSONS	Project: ANG PFAS ESI
	Number: Burlington ANGB
	Client: ANG

Location: Burlington, VT	Slug Test: BRLTN02-MW01S	Test Well: BRLTN02-MW01S
Test Conducted by: Parsons		Test Date: 7/14/2019
Analysis Performed by:	New analysis 1	Analysis Date: 9/23/2019
Aquifer Thickness: 40.00 ft		

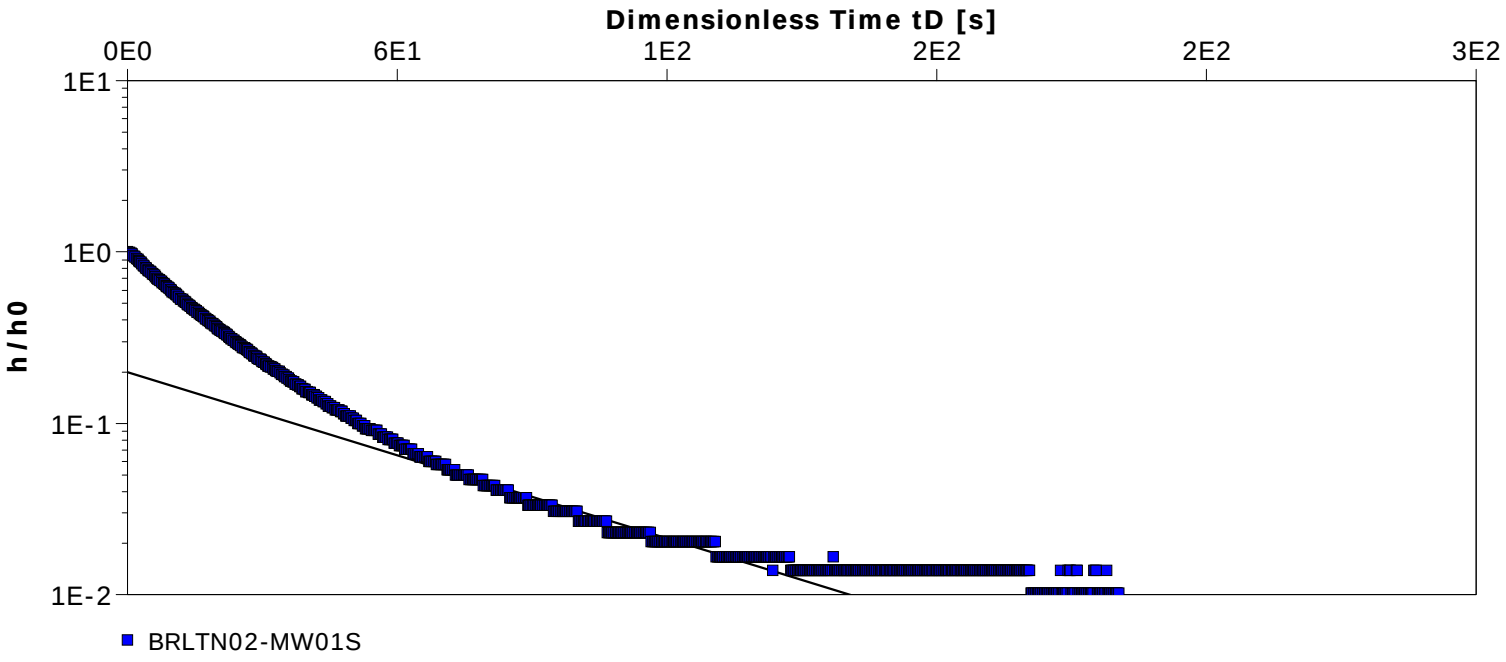


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [cm/s]	
BRLTN02-MW01S	9.61×10^{-4}	

Burlington ANGB **PFAS ESI** **South Burlington, VT**	**Slug Test Analysis Report**
PARSONS	Project: ANG PFAS ESI
	Number: Burlington ANGB
	Client: ANG

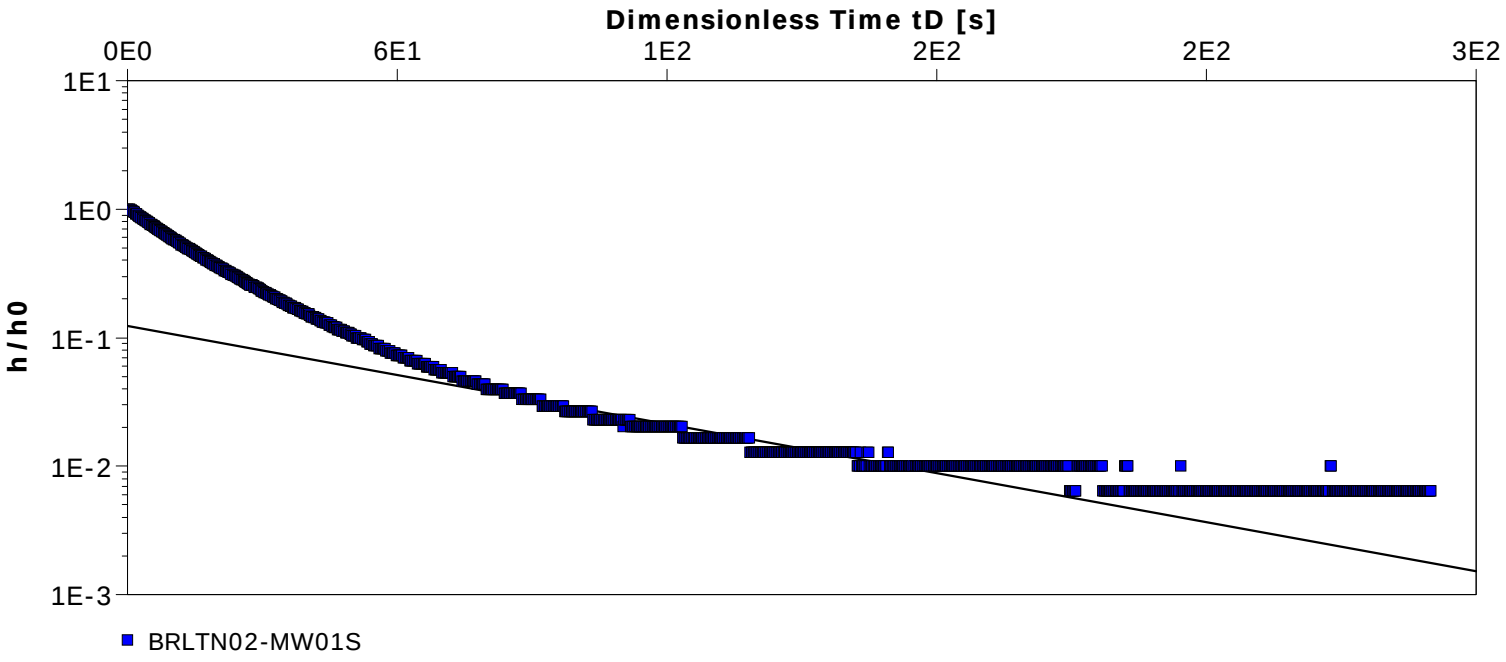
Location: Burlington, VT	Slug Test: BRLTN02-MW01S	Test Well: BRLTN02-MW01S
Test Conducted by: Parsons		Test Date: 7/14/2019
Analysis Performed by:	New analysis 1	Analysis Date: 9/23/2019
Aquifer Thickness: 40.00 ft		



Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [cm/s]	
BRLTN02-MW01S	7.33×10^{-4}	

PARSONS **Burlington ANGB PFAS ESI South Burlington, VT**	**Slug Test Analysis Report**	
	Project: ANG PFAS ESI	
	Number: Burlington ANGB	
	Client: ANG	
Location: Burlington, VT	Slug Test: BRLTN02-MW01S	Test Well: BRLTN02-MW01S
Test Conducted by: Parsons		Test Date: 7/14/2019
Analysis Performed by:	New analysis 1	Analysis Date: 9/23/2019
Aquifer Thickness: 40.00 ft		

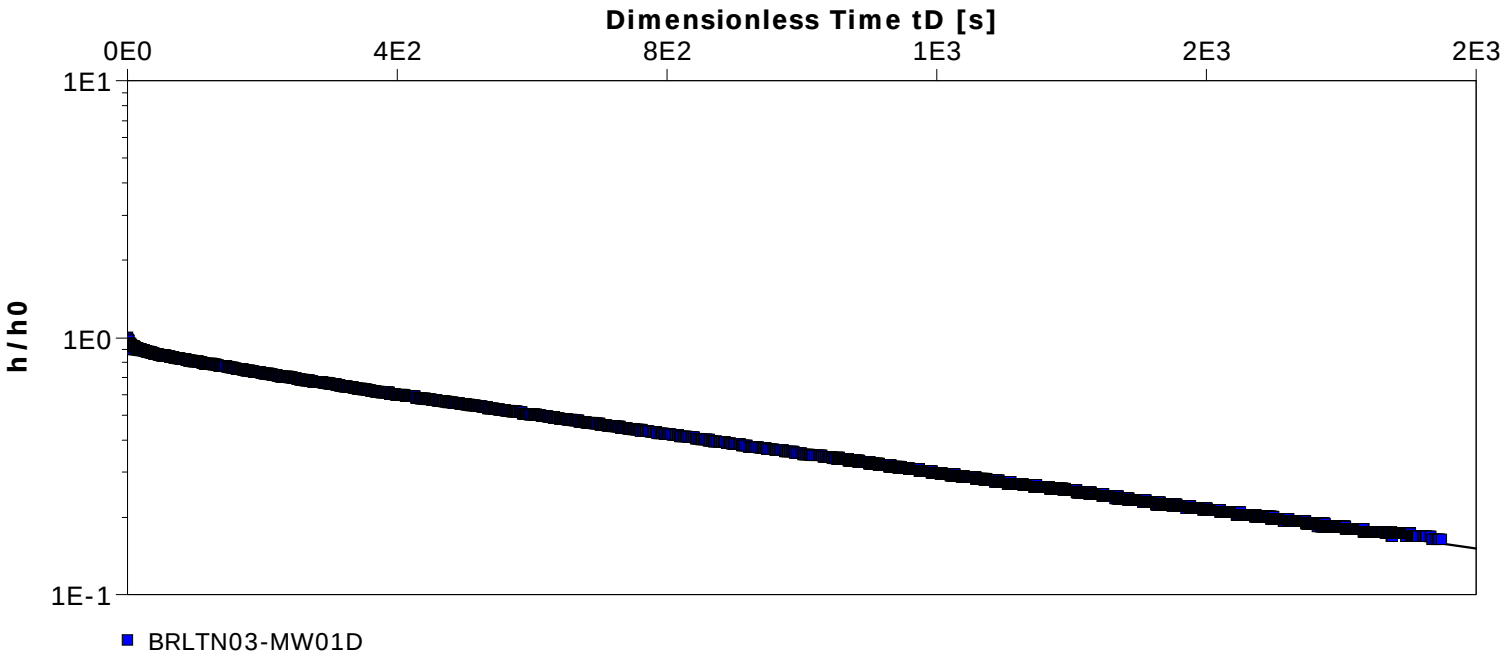


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [cm/s]	
BRLTN02-MW01S	5.77×10^{-4}	

PARSONS **Burlington ANGB PFAS ESI South Burlington, VT**	**Slug Test Analysis Report**	
	Project: ANG PFAS ESI	
	Number: Burlington ANGB	
	Client: ANG	

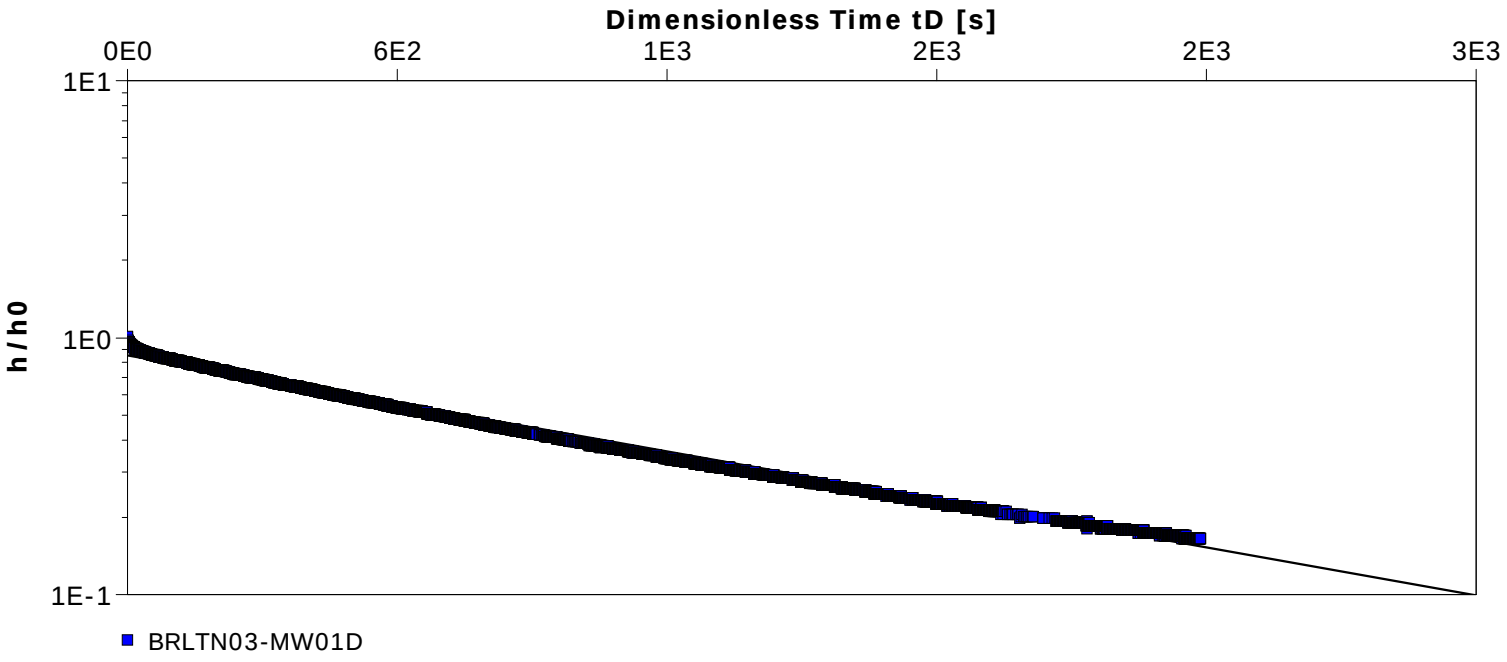
Location: Burlington, VT	Slug Test: BRLTN03-MW01D	Test Well: BRLTN03-MW01D
Test Conducted by: Parsons		Test Date: 7/13/2019
Analysis Performed by:	New analysis 1	Analysis Date: 9/23/2019
Aquifer Thickness: 19.00 ft		



Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [cm/s]	
BRLTN03-MW01D	4.43×10^{-5}	

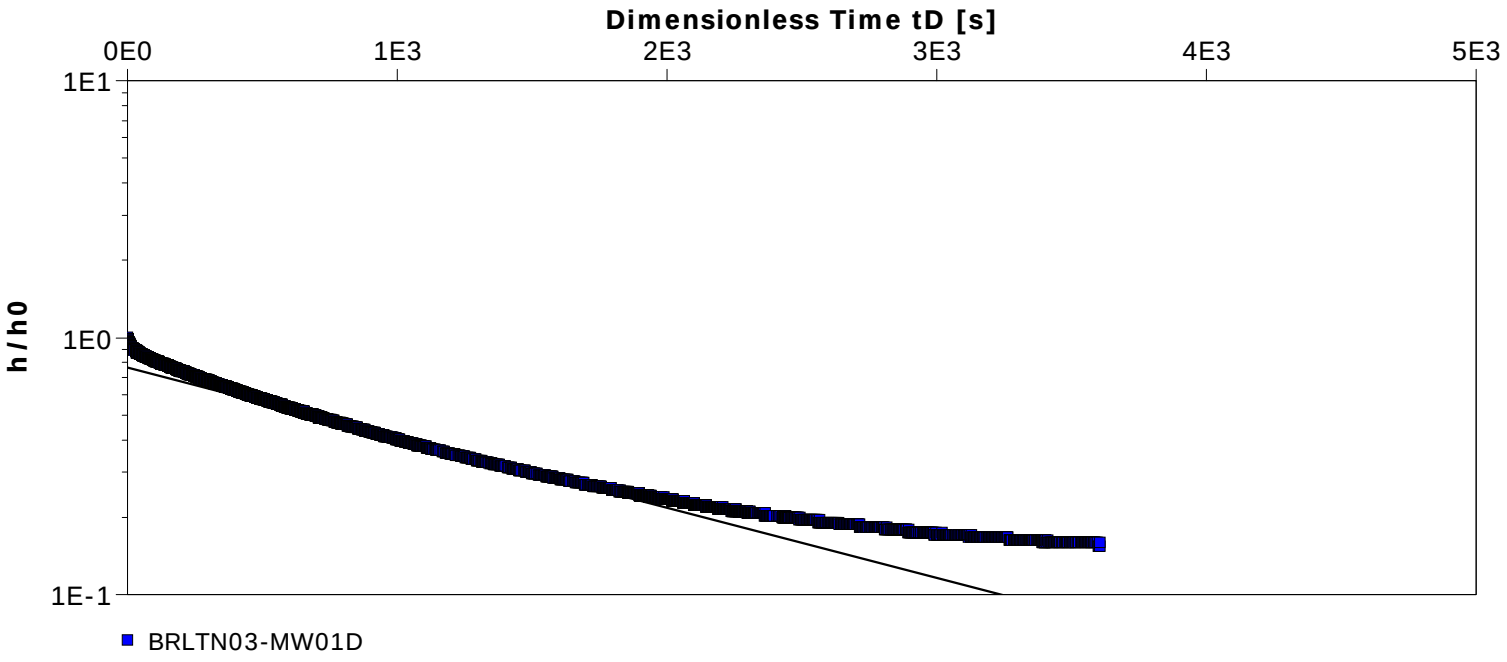
PARSONS **Burlington ANGB PFAS ESI South Burlington, VT**	**Slug Test Analysis Report**	
	Project: ANG PFAS ESI	
	Number: Burlington ANGB	
	Client: ANG	
Location: Burlington, VT	Slug Test: BRLTN03-MW01D	Test Well: BRLTN03-MW01D
Test Conducted by: Parsons		Test Date: 7/13/2019
Analysis Performed by:	New analysis 1	Analysis Date: 9/23/2019
Aquifer Thickness: 19.00 ft		



Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [cm/s]	
BRLTN03-MW01D	3.65×10^{-5}	

PARSONS **Burlington ANGB PFAS ESI South Burlington, VT**	**Slug Test Analysis Report**	
	Project: ANG PFAS ESI	
	Number: Burlington ANGB	
	Client: ANG	
Location: Burlington, VT	Slug Test: BRLTN03-MW01D	Test Well: BRLTN03-MW01D
Test Conducted by: Parsons		Test Date: 7/13/2019
Analysis Performed by:	New analysis 1	Analysis Date: 9/23/2019
Aquifer Thickness: 19.00 ft		

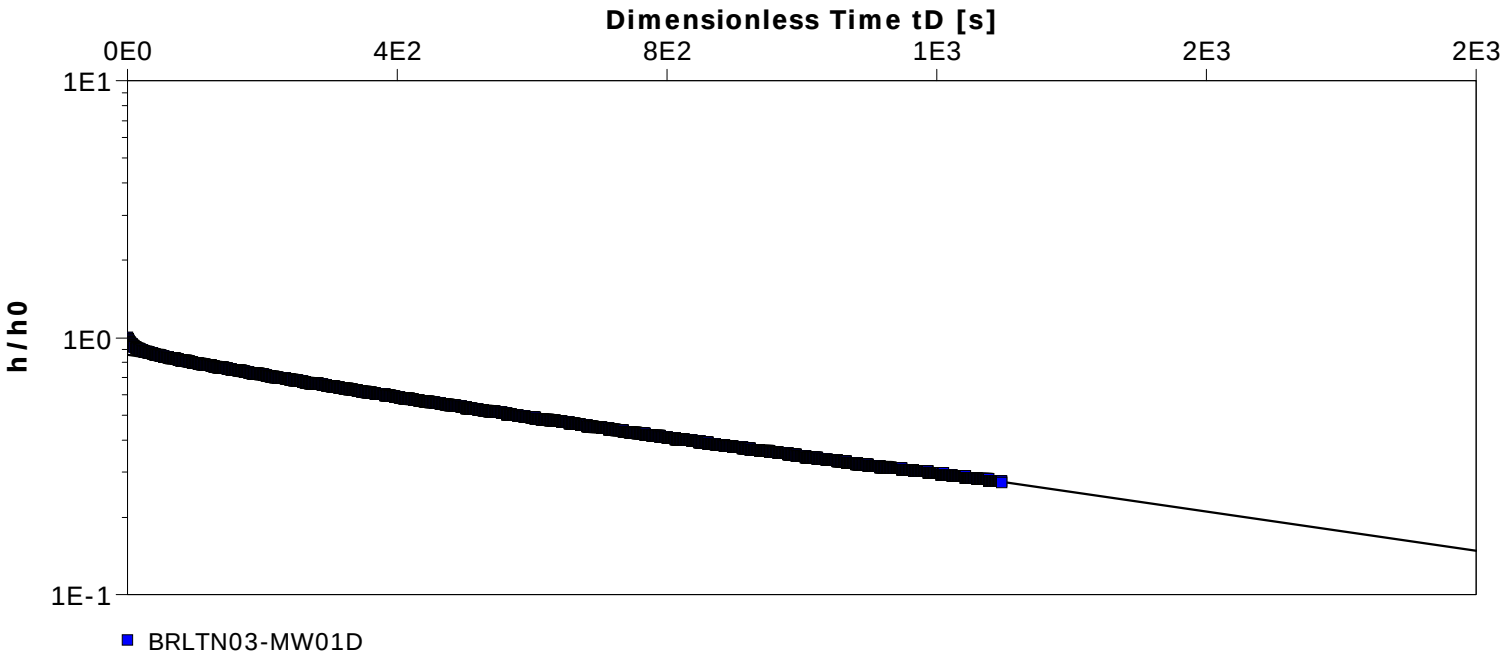


Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [cm/s]	
BRLTN03-MW01D	3.20×10^{-5}	

PARSONS **Burlington ANGB PFAS ESI South Burlington, VT**	**Slug Test Analysis Report**	
	Project: ANG PFAS ESI	
	Number: Burlington ANGB	
	Client: ANG	

Location: Burlington, VT	Slug Test: BRLTN03-MW01D	Test Well: BRLTN03-MW01D
Test Conducted by: Parsons		Test Date: 7/13/2019
Analysis Performed by:	New analysis 1	Analysis Date: 9/23/2019
Aquifer Thickness: 19.00 ft		

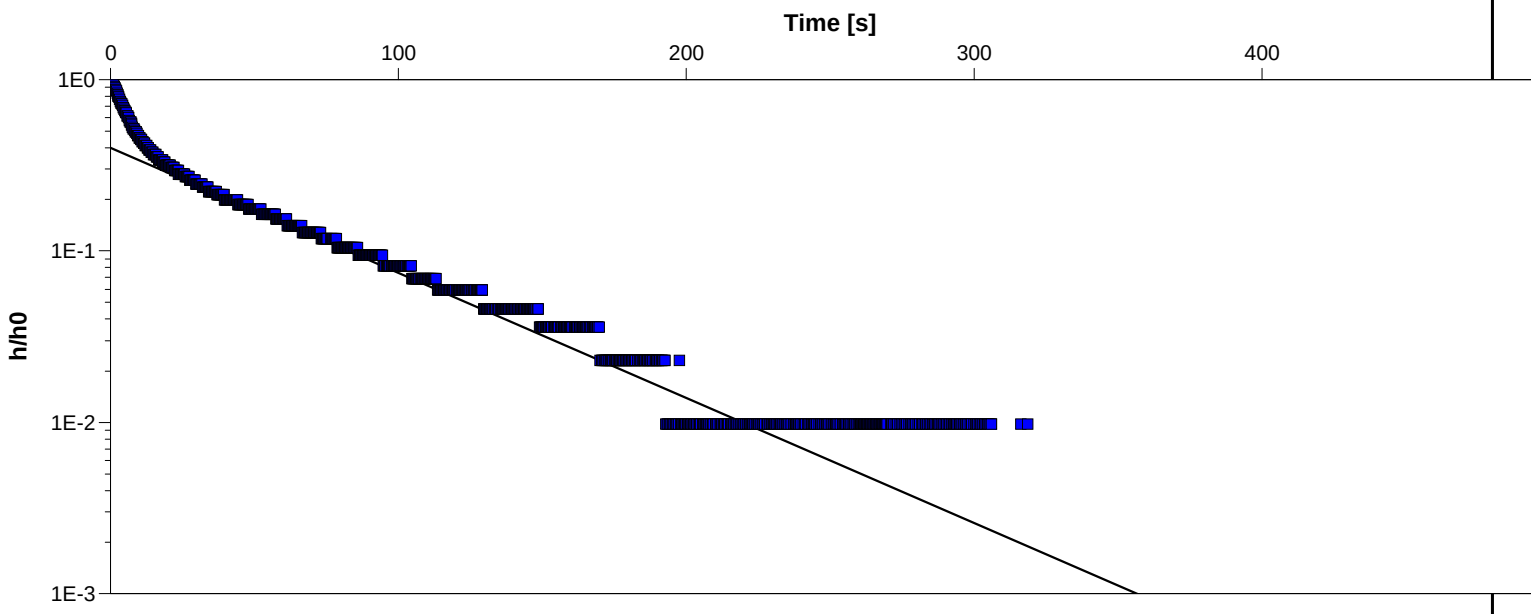


Calculation using Hvorslev

Observation Well	Hydraulic Conductivity [cm/s]	
BRLTN03-MW01D	4.48×10^{-5}	

Burlington ANGB **PFAS ESI** **South Burlington, VT**	**Slug Test Analysis Report**
PARSONS	Project: ANG PFAS ESI
	Number: Burlington ANGB
	Client: ANG

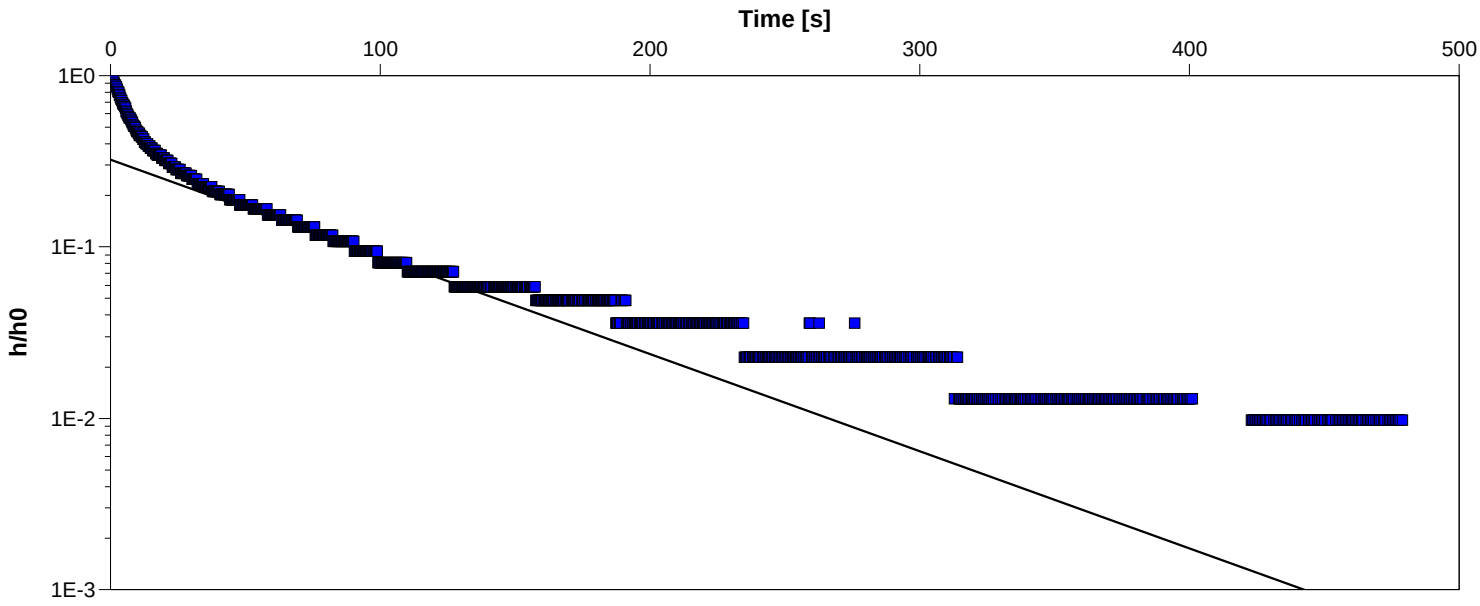
Location: Burlington, VT	Slug Test: BRLTN03-MW01S	Test Well: BRLTN03-MW01S
Test Conducted by: Parsons		Test Date: 7/13/2019
Analysis Performed by:	New analysis 1	Analysis Date: 9/23/2019
Aquifer Thickness: 40.00 ft		



Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [cm/s]	
BRLTN03-MW01S	5.40×10^{-4}	

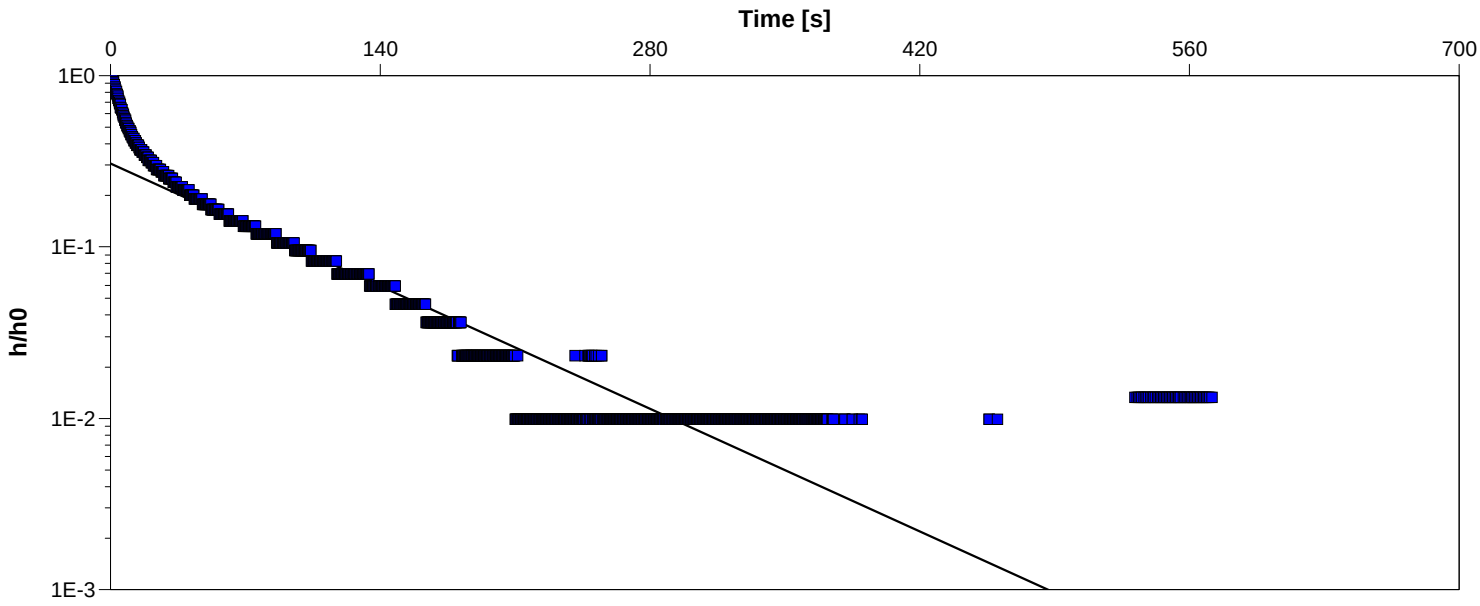
PARSONS **Burlington ANGB PFAS ESI South Burlington, VT**	**Slug Test Analysis Report**	
	Project: ANG PFAS ESI	
	Number: Burlington ANGB	
	Client: ANG	
Location: Burlington, VT	Slug Test: BRLTN03-MW01S	Test Well: BRLTN03-MW01S
Test Conducted by: Parsons		Test Date: 7/13/2019
Analysis Performed by:	New analysis 1	Analysis Date: 9/23/2019
Aquifer Thickness: 40.00 ft		



Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [cm/s]	
BRLTN03-MW01S	4.20×10^{-4}	

PARSONS **Burlington ANGB PFAS ESI South Burlington, VT**	**Slug Test Analysis Report**	
	Project: ANG PFAS ESI	
	Number: Burlington ANGB	
	Client: ANG	
Location: Burlington, VT	Slug Test: BRLTN03-MW01S	Test Well: BRLTN03-MW01S
Test Conducted by: Parsons		Test Date: 7/13/2019
Analysis Performed by:	New analysis 1	Analysis Date: 9/23/2019
Aquifer Thickness: 40.00 ft		

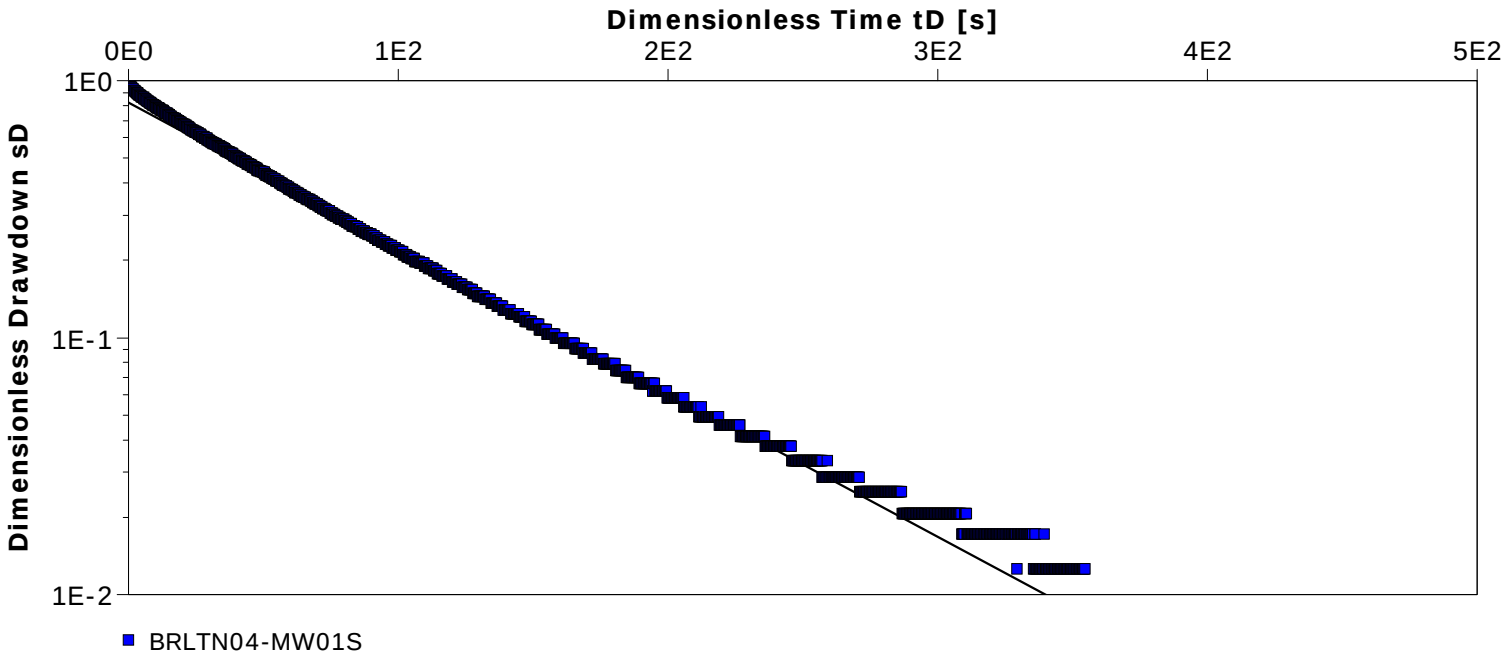


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [cm/s]	
BRLTN03-MW01S	3.79×10^{-4}	

Burlington ANGB **PFAS ESI** **South Burlington, VT**	**Slug Test Analysis Report**
PARSONS	Project: ANG PFAS ESI
	Number: Burlington ANGB
	Client: ANG

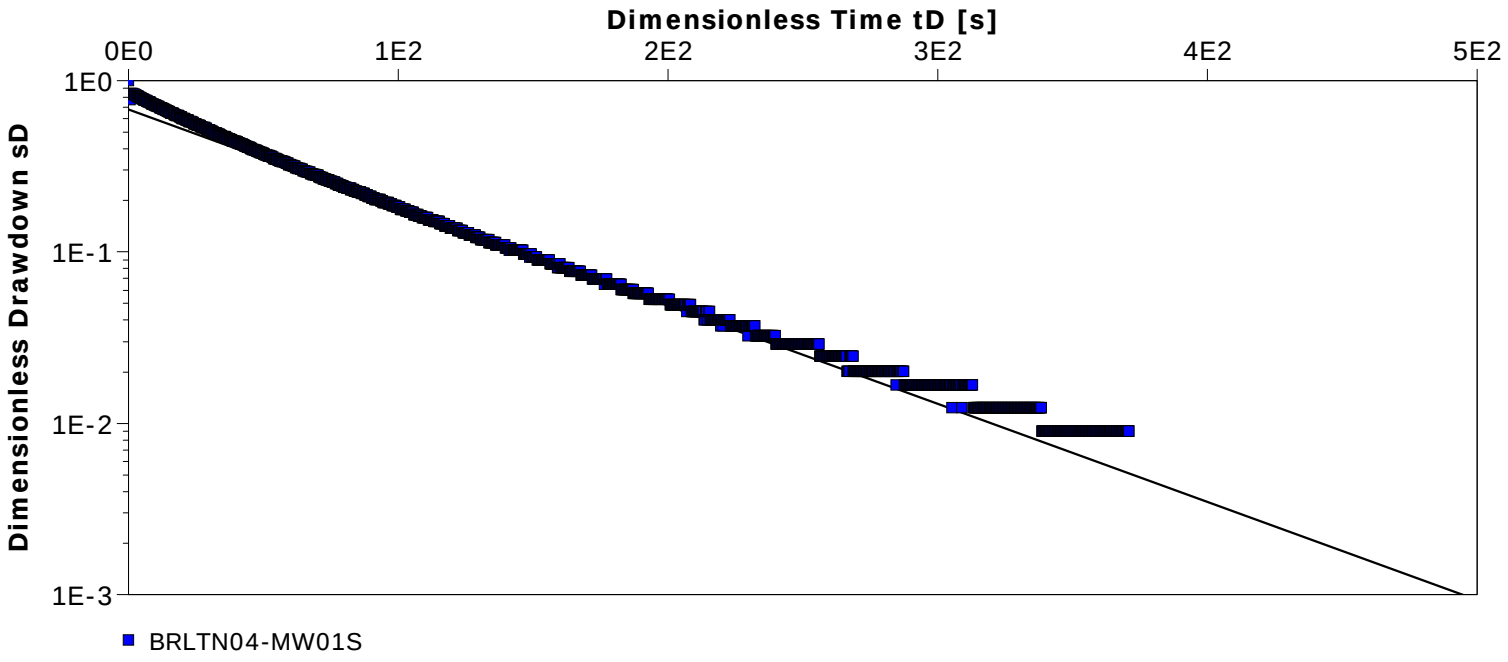
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Test Conducted by: Parsons		Test Date: 7/15/2019
Analysis Performed by:	New analysis 1	Analysis Date: 9/23/2019
Aquifer Thickness: 40.00 ft		



Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [cm/s]	
BRLTN04-MW01S	5.10×10^{-4}	

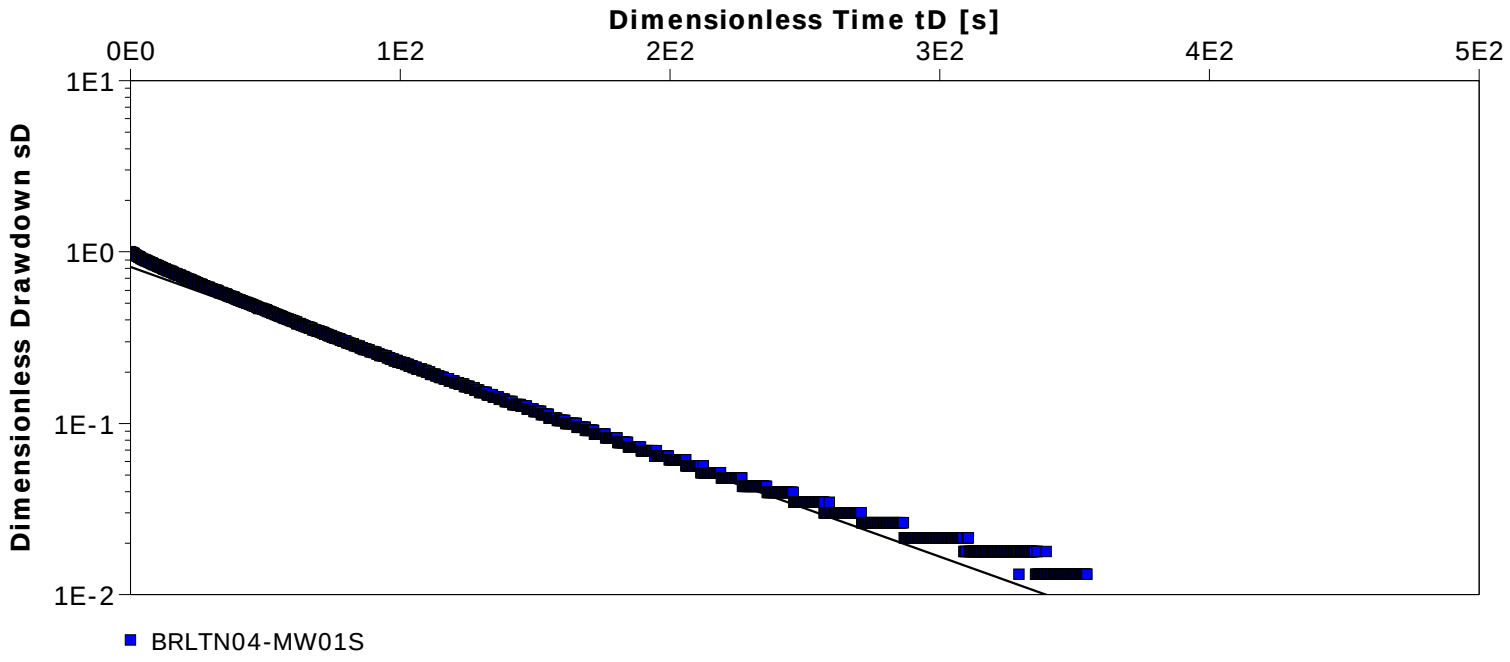
PARSONS **Burlington ANGB PFAS ESI South Burlington, VT**	**Slug Test Analysis Report**	
	Project: ANG PFAS ESI	
	Number: Burlington ANGB	
	Client: ANG	
Location: Burlington, VT	Slug Test: BRLTN04-MW01S	Test Well: BRLTN04-MW01S
Test Conducted by: Parsons		Test Date: 7/15/2019
Analysis Performed by:	New analysis 1	Analysis Date: 9/23/2019
Aquifer Thickness: 40.00 ft		



Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [cm/s]	
BRLTN04-MW01S	5.20×10^{-4}	

PARSONS **Burlington ANGB PFAS ESI South Burlington, VT**	**Slug Test Analysis Report**	
	Project: ANG PFAS ESI	
	Number: Burlington ANGB	
	Client: ANG	
Location: Burlington, VT	Slug Test: BRLTN04-MW01S	Test Well: BRLTN04-MW01S
Test Conducted by: Parsons		Test Date: 7/15/2019
Analysis Performed by:	New analysis 1	Analysis Date: 9/23/2019
Aquifer Thickness: 40.00 ft		

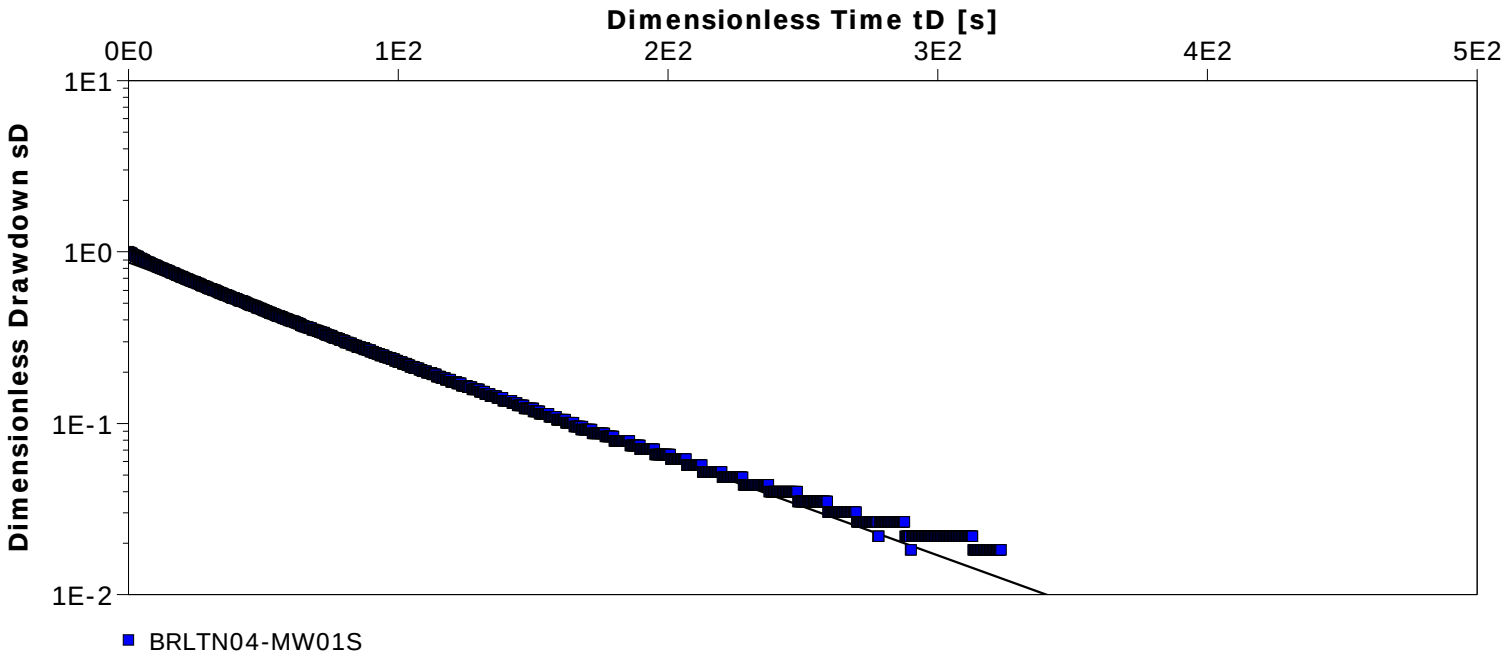


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [cm/s]	
BRLTN04-MW01S	5.10×10^{-4}	

PARSONS **Burlington ANGB** **PFAS ESI** **South Burlington, VT**	**Slug Test Analysis Report**	
	Project: ANG PFAS ESI	
	Number: Burlington ANGB	
	Client: ANG	

Location: Burlington, VT	Slug Test: BRLTN04-MW01S	Test Well: BRLTN04-MW01S
Test Conducted by: Parsons		Test Date: 7/15/2019
Analysis Performed by:	New analysis 1	Analysis Date: 9/23/2019
Aquifer Thickness: 40.00 ft		

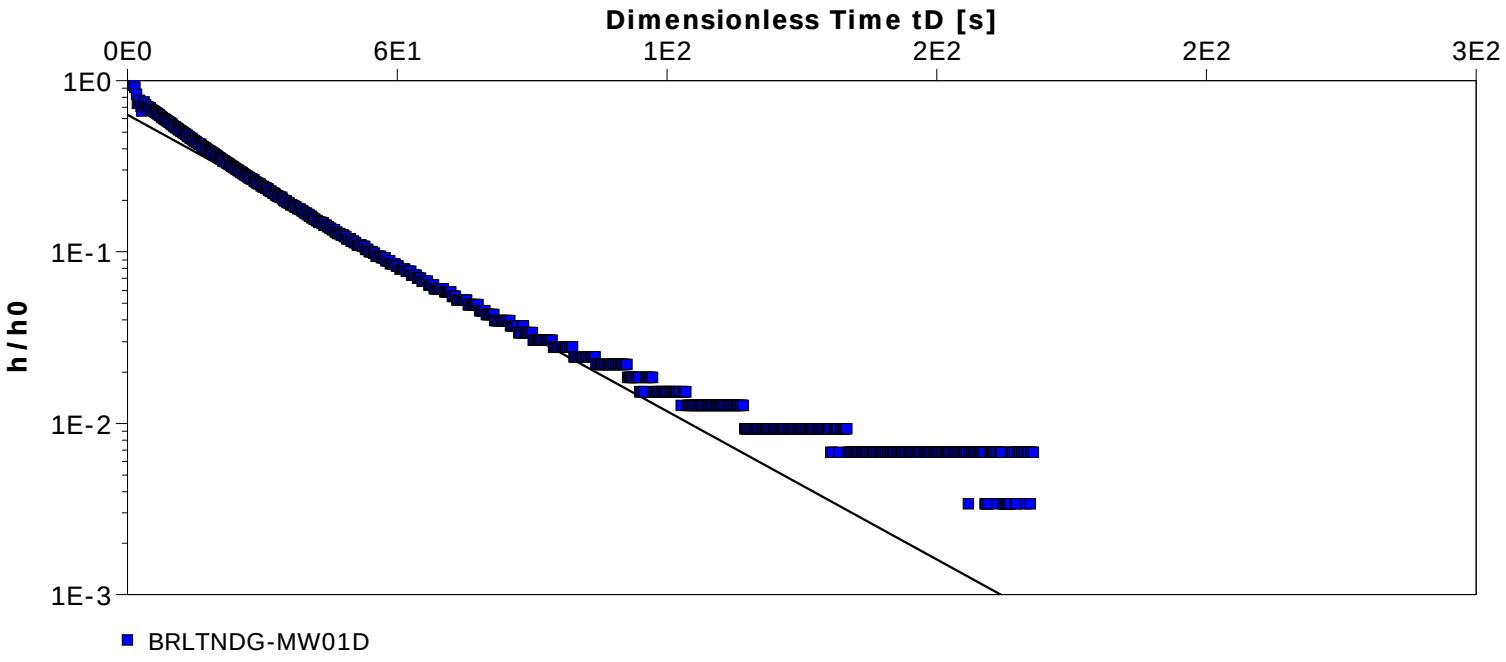


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [cm/s]	
BRLTN04-MW01S	5.17×10^{-4}	

PARSONS **Burlington ANGB PFAS ESI South Burlington, VT**	**Slug Test Analysis Report**	
	Project: ANG PFAS ESI	
	Number: Burlington ANGB	
	Client: ANG	

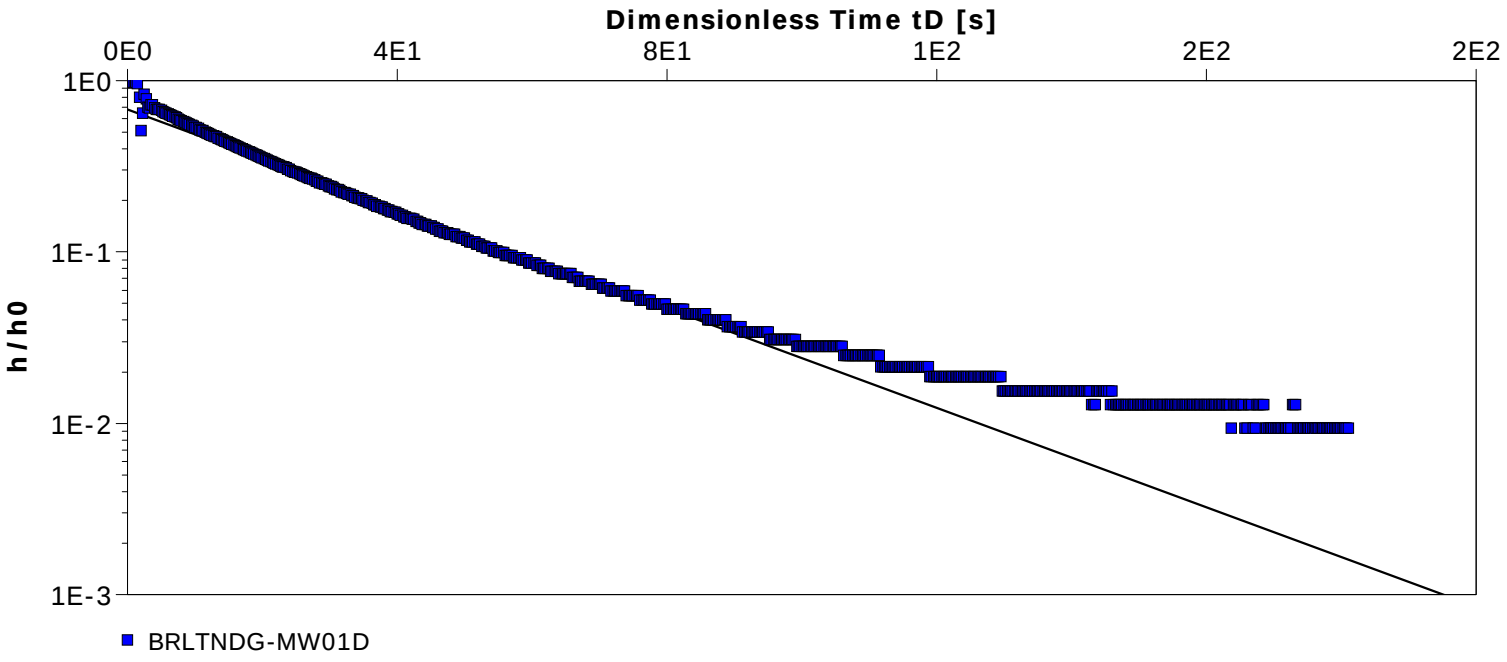
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Test Conducted by: Parsons		Test Date: 7/14/2019
Analysis Performed by:	New analysis 1	Analysis Date: 9/23/2019
Aquifer Thickness: 20.00 ft		



Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [cm/s]	
BRLTNDG-MW01D	2.22×10^{-3}	

PARSONS **Burlington ANGB PFAS ESI South Burlington, VT**	**Slug Test Analysis Report**	
	Project: ANG PFAS ESI	
	Number: Burlington ANGB	
	Client: ANG	
Location: Burlington, VT	Slug Test: BRLTNDG-MW01D	Test Well: BRLTNDG-MW01D
Test Conducted by: Parsons		Test Date: 7/14/2019
Analysis Performed by:	New analysis 1	Analysis Date: 9/23/2019
Aquifer Thickness: 20.00 ft		

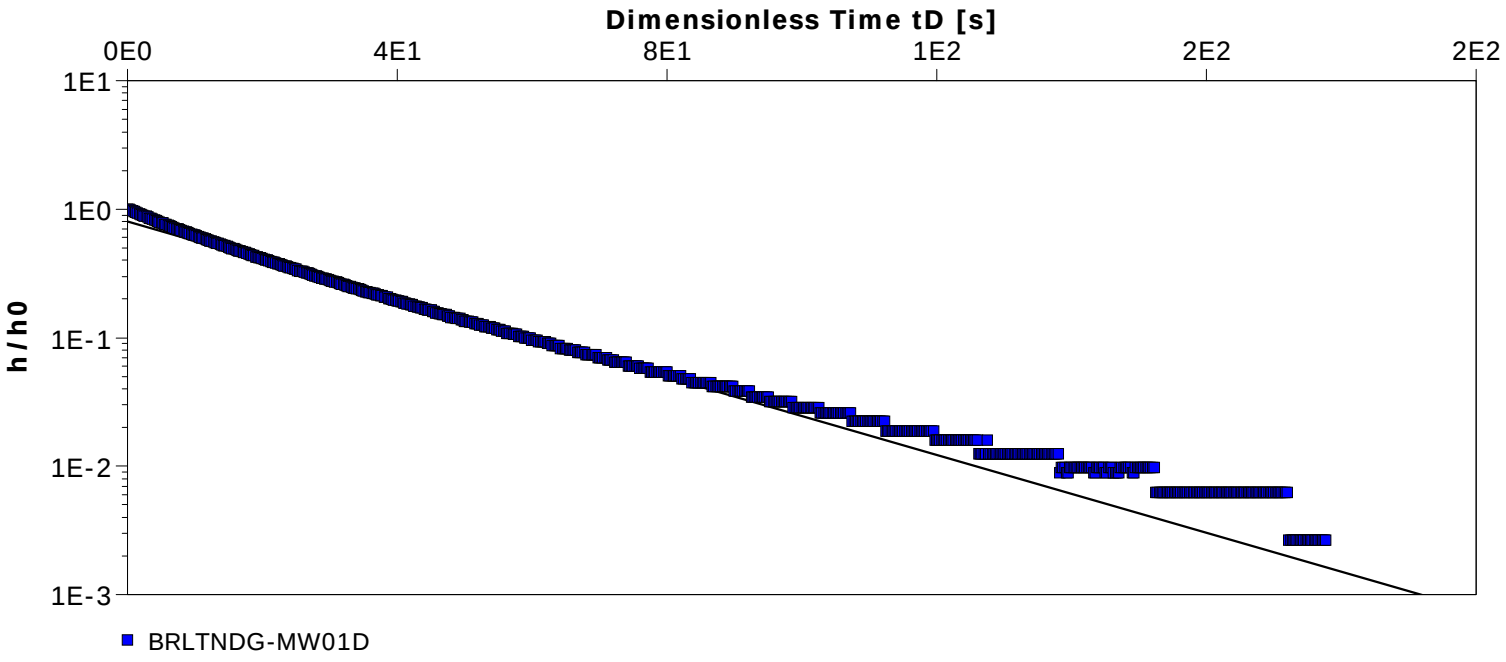


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [cm/s]	
BRLTNDG-MW01D	2.23×10^{-3}	

PARSONS **Burlington ANGB PFAS ESI South Burlington, VT**	**Slug Test Analysis Report**	
	Project: ANG PFAS ESI	
	Number: Burlington ANGB	
	Client: ANG	

Location: Burlington, VT	Slug Test: BRLTNDG-MW01D	Test Well: BRLTNDG-MW01D
Test Conducted by: Parsons		Test Date: 7/14/2019
Analysis Performed by:	New analysis 1	Analysis Date: 9/23/2019
Aquifer Thickness: 20.00 ft		

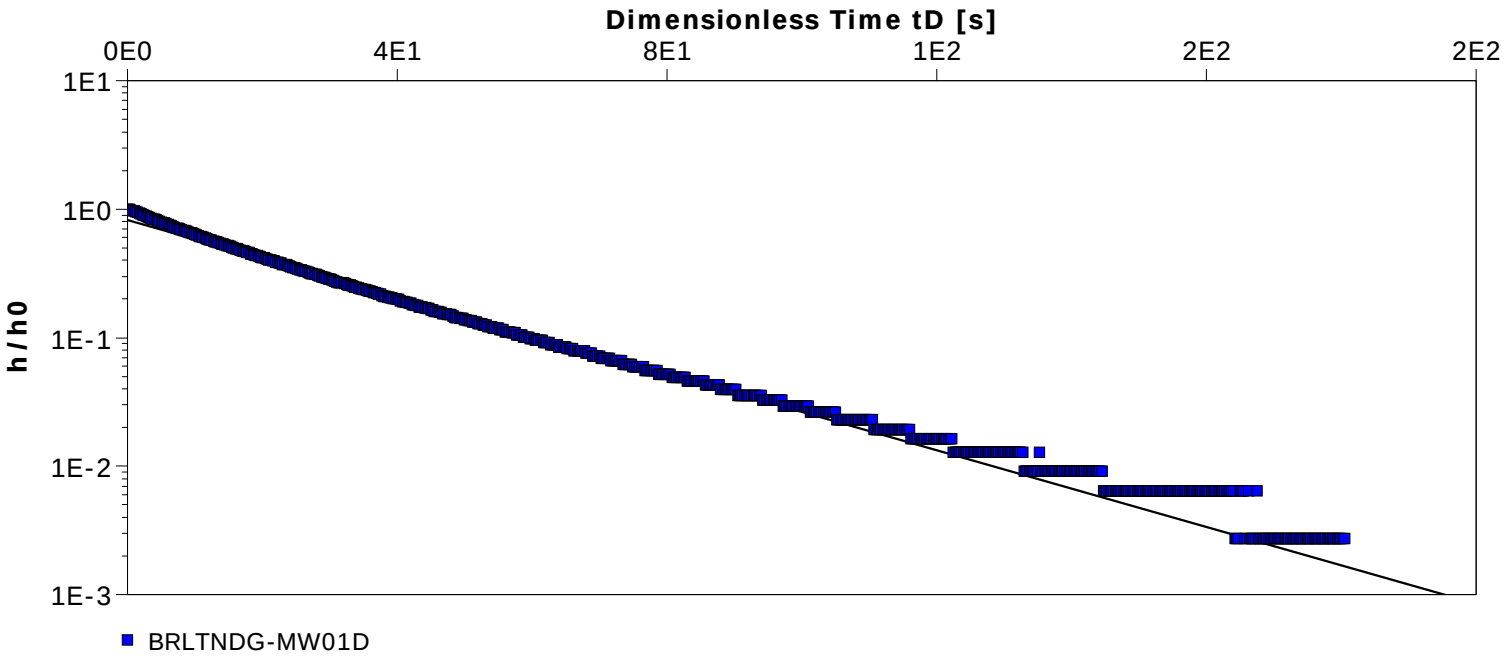


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [cm/s]	
BRLTNDG-MW01D	2.33×10^{-3}	

PARSONS **Burlington ANGB PFAS ESI South Burlington, VT**	**Slug Test Analysis Report**	
	Project: ANG PFAS ESI	
	Number: Burlington ANGB	
	Client: ANG	

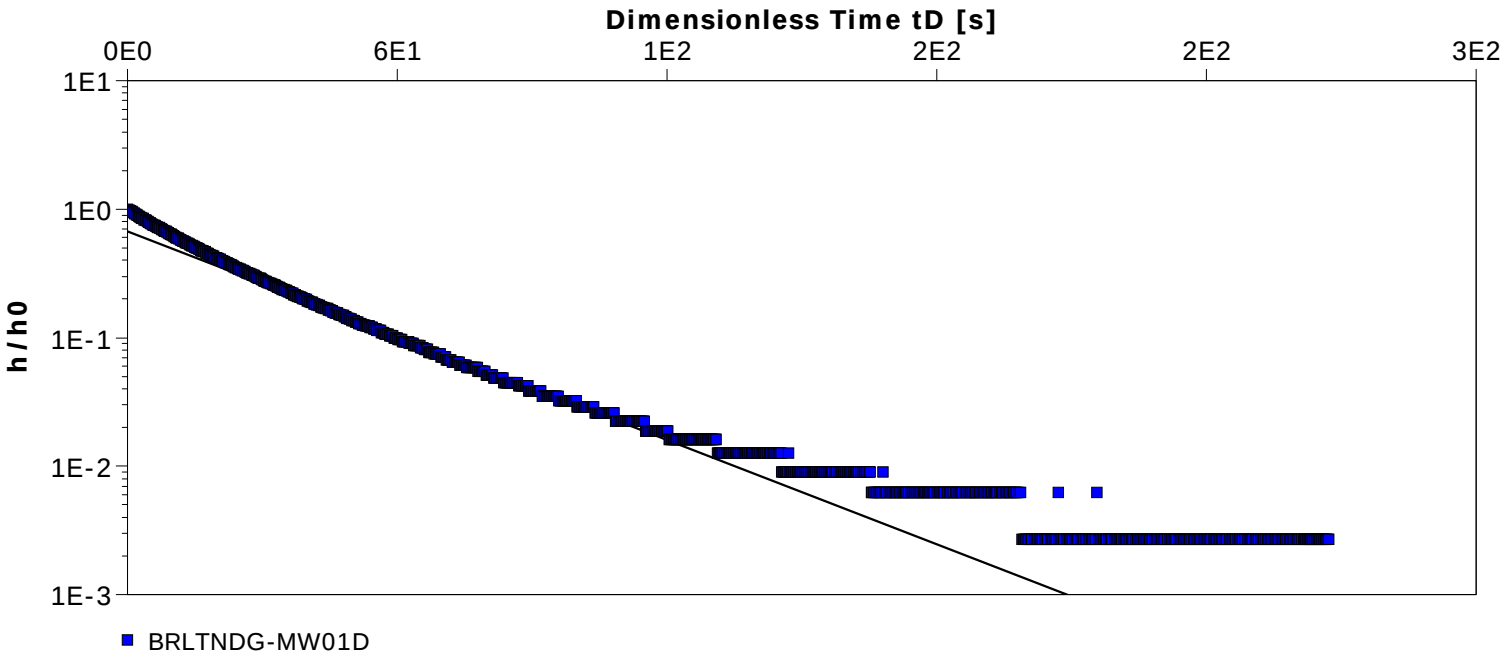
Location: Burlington, VT	Slug Test: BRLTNDG-MW01D	Test Well: BRLTNDG-MW01D
Test Conducted by: Parsons		Test Date: 7/14/2019
Analysis Performed by:	New analysis 1	Analysis Date: 9/23/2019
Aquifer Thickness: 20.00 ft		



Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [cm/s]	
BRLTNDG-MW01D	2.30×10^{-3}	

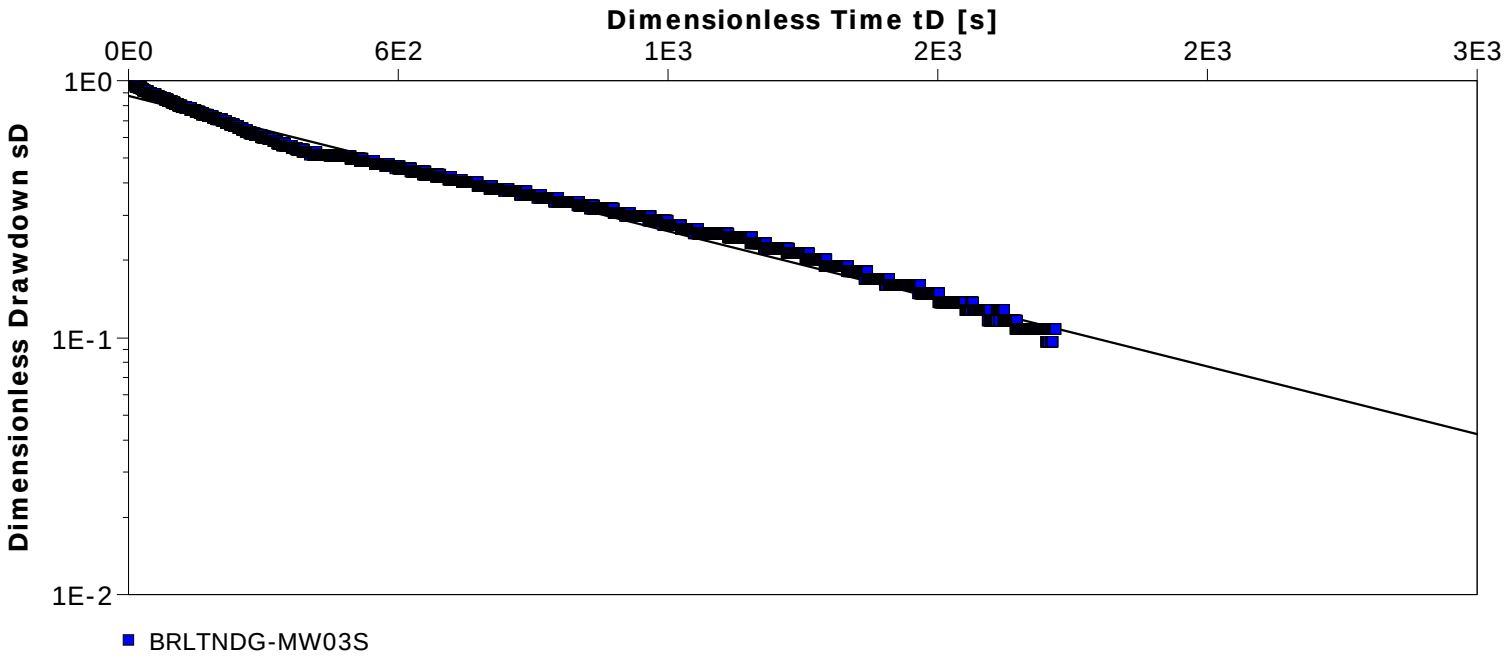
PARSONS **Burlington ANGB PFAS ESI South Burlington, VT**	**Slug Test Analysis Report**	
	Project: ANG PFAS ESI	
	Number: Burlington ANGB	
	Client: ANG	
Location: Burlington, VT	Slug Test: BRLTNDG-MW01D	Test Well: BRLTNDG-MW01D
Test Conducted by: Parsons		Test Date: 7/14/2019
Analysis Performed by:	New analysis 1	Analysis Date: 9/23/2019
Aquifer Thickness: 20.00 ft		



Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [cm/s]	
BRLTNDG-MW01D	2.08×10^{-3}	

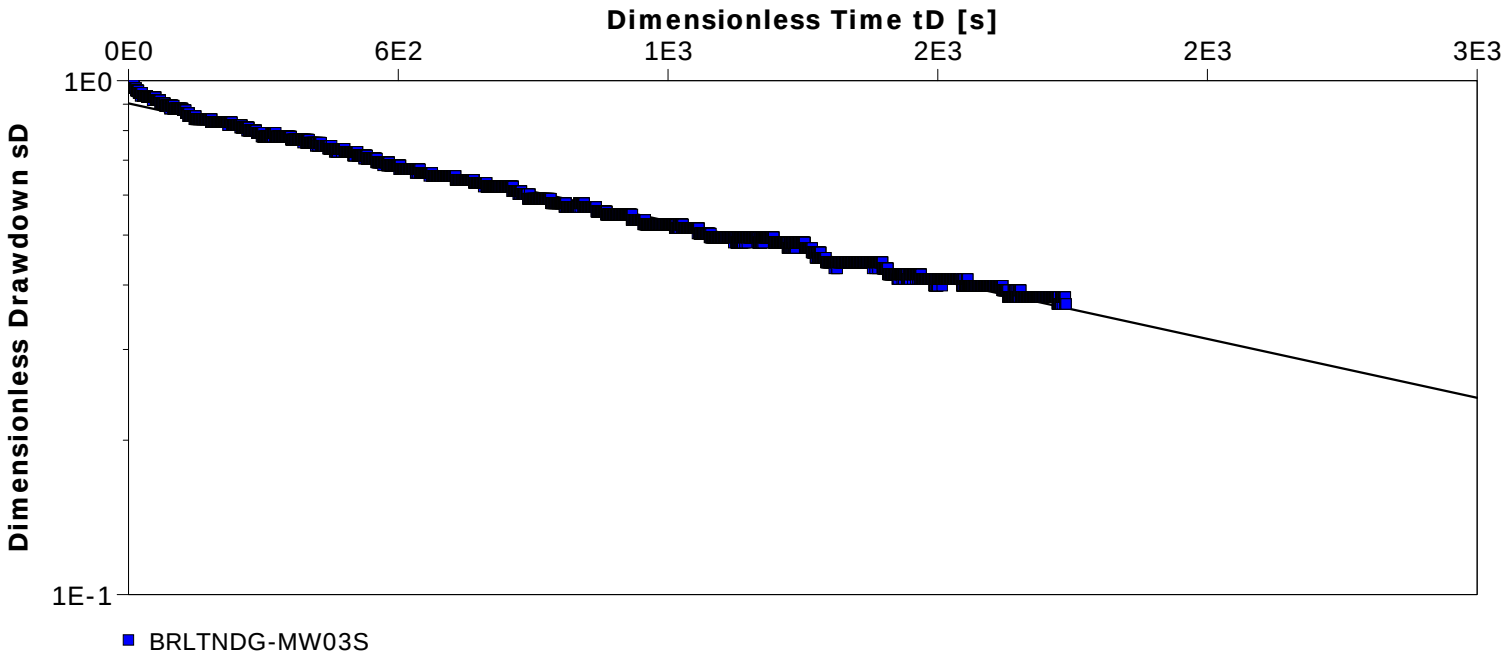
PARSONS **Burlington ANGB PFAS ESI South Burlington, VT**	**Slug Test Analysis Report**	
	Project: ANG PFAS ESI	
	Number: Burlington ANGB	
	Client: ANG	
Location: Burlington, VT	Slug Test: BRLTNDG-MW03S	Test Well: BRLTNDG-MW03S
Test Conducted by: Parsons		Test Date: 7/16/2019
Analysis Performed by:	New analysis 1	Analysis Date: 9/23/2019
Aquifer Thickness: 40.00 ft		



Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [cm/s]	
BRLTNDG-MW03S	6.74×10^{-5}	

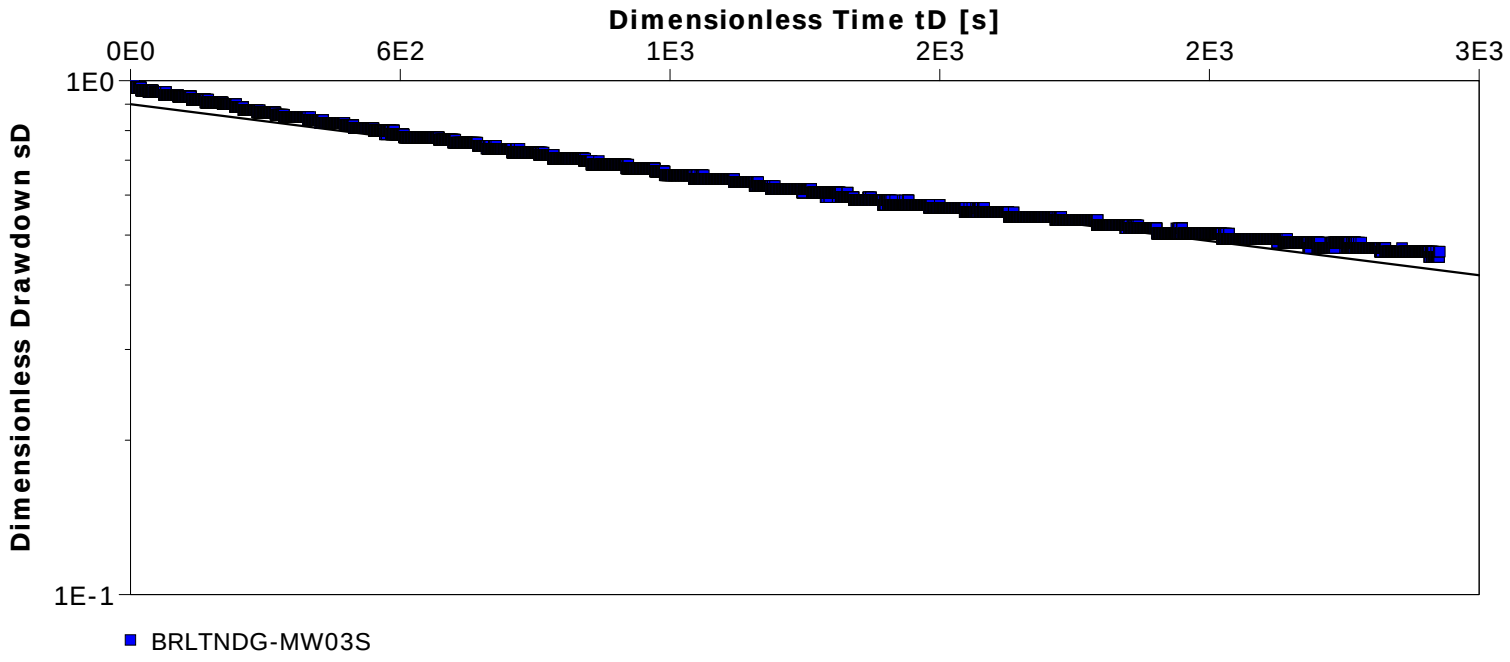
PARSONS **Burlington ANGB PFAS ESI South Burlington, VT**	**Slug Test Analysis Report**	
	Project: ANG PFAS ESI	
	Number: Burlington ANGB	
	Client: ANG	
Location: Burlington, VT	Slug Test: BRLTNDG-MW03S	Test Well: BRLTNDG-MW03S
Test Conducted by: Parsons		Test Date: 7/16/2019
Analysis Performed by:	New analysis 1	Analysis Date: 9/23/2019
Aquifer Thickness: 40.00 ft		



Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [cm/s]	
BRLTNDG-MW03S	2.94×10^{-5}	

PARSONS **Burlington ANGB PFAS ESI South Burlington, VT**	**Slug Test Analysis Report**	
	Project: ANG PFAS ESI	
	Number: Burlington ANGB	
	Client: ANG	
Location: Burlington, VT	Slug Test: BRLTNDG-MW03S	Test Well: BRLTNDG-MW03S
Test Conducted by: Parsons		Test Date: 7/16/2019
Analysis Performed by:	New analysis 1	Analysis Date: 9/23/2019
Aquifer Thickness: 40.00 ft		

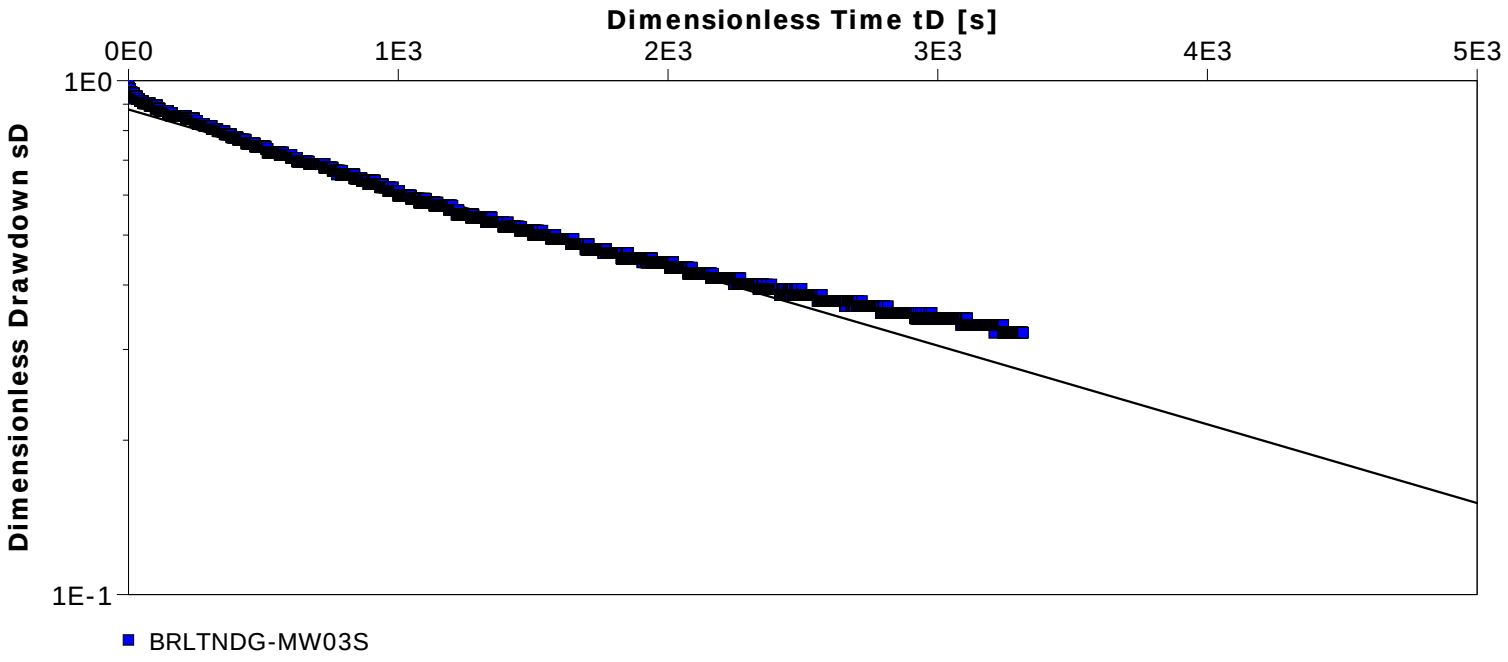


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [cm/s]	
BRLTNDG-MW03S	1.71×10^{-5}	

Burlington ANGB **PFAS ESI** **South Burlington, VT**	**Slug Test Analysis Report**
PARSONS	Project: ANG PFAS ESI
	Number: Burlington ANGB
	Client: ANG

Location: Burlington, VT	Slug Test: BRLTNDG-MW03S	Test Well: BRLTNDG-MW03S
Test Conducted by: Parsons		Test Date: 7/16/2019
Analysis Performed by:	New analysis 1	Analysis Date: 9/23/2019
Aquifer Thickness: 40.00 ft		

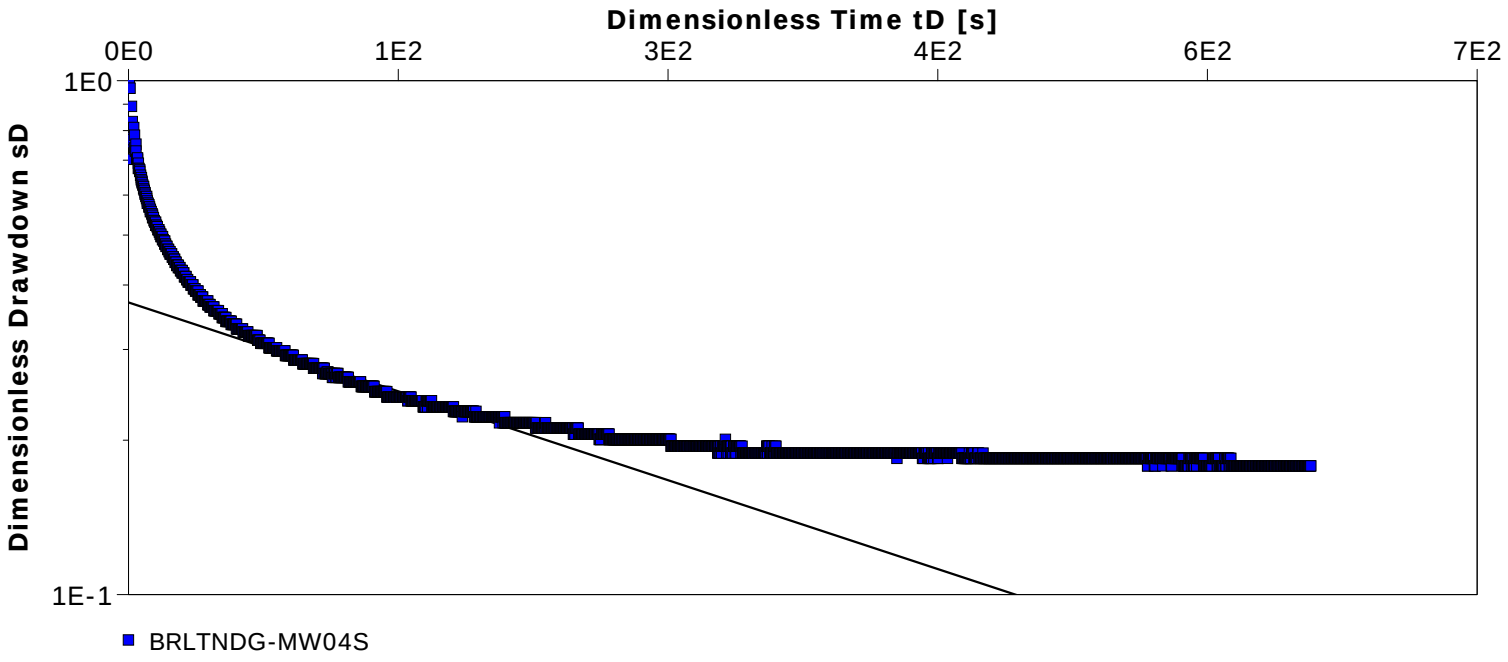


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [cm/s]	
BRLTNDG-MW03S	2.36×10^{-5}	

Burlington ANGB **PFAS ESI** **South Burlington, VT**	**Slug Test Analysis Report**
PARSONS	Project: ANG PFAS ESI
	Number: Burlington ANGB
	Client: ANG

Location: Burlington, VT	Slug Test: BRLTNDG-MW04S	Test Well: BRLTNDG-MW04S
Test Conducted by: Parsons		Test Date: 7/15/2019
Analysis Performed by:	New analysis 1	Analysis Date: 9/23/2019
Aquifer Thickness: 40.00 ft		

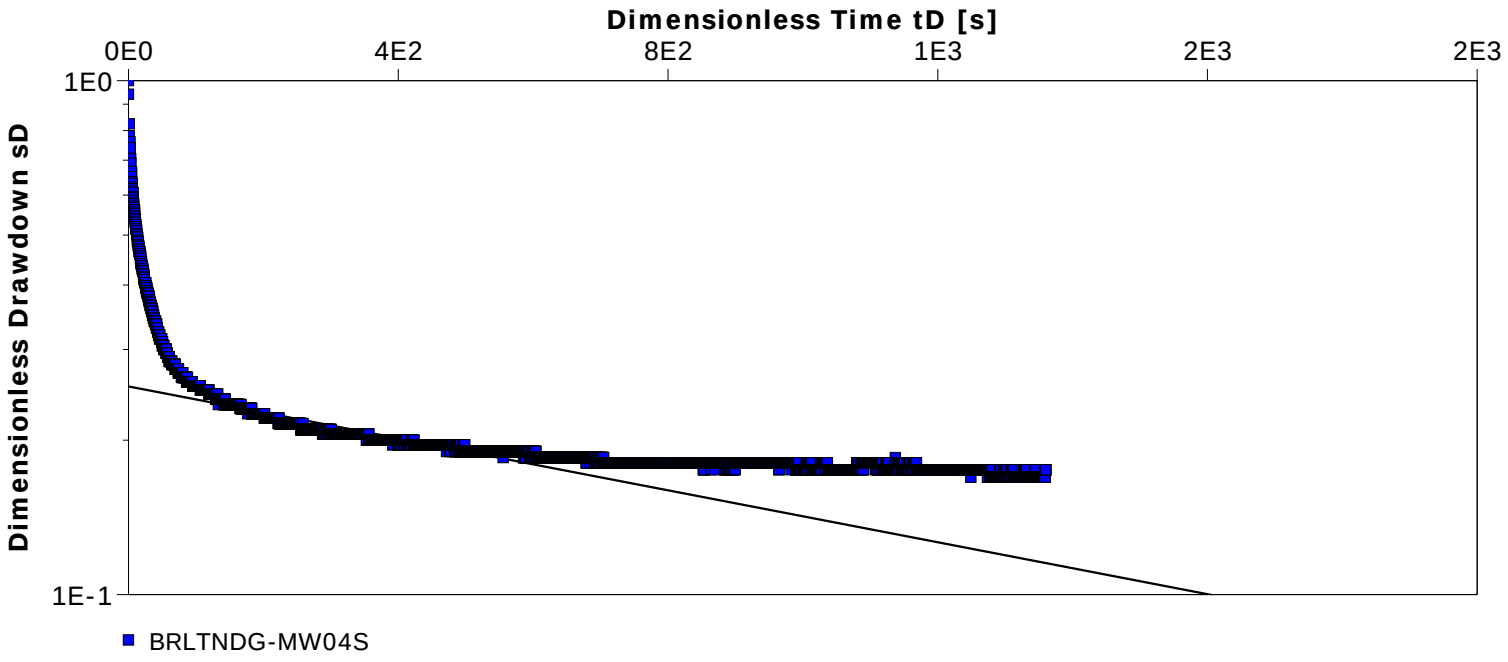


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [cm/s]	
BRLTNDG-MW04S	1.12×10^{-4}	

Burlington ANGB **PFAS ESI** **South Burlington, VT**	**Slug Test Analysis Report**
PARSONS	Project: ANG PFAS ESI
	Number: Burlington ANGB
	Client: ANG

Location: Burlington, VT	Slug Test: BRLTNDG-MW04S	Test Well: BRLTNDG-MW04S
Test Conducted by: Parsons		Test Date: 7/15/2019
Analysis Performed by:	New analysis 1	Analysis Date: 9/23/2019
Aquifer Thickness: 40.00 ft		

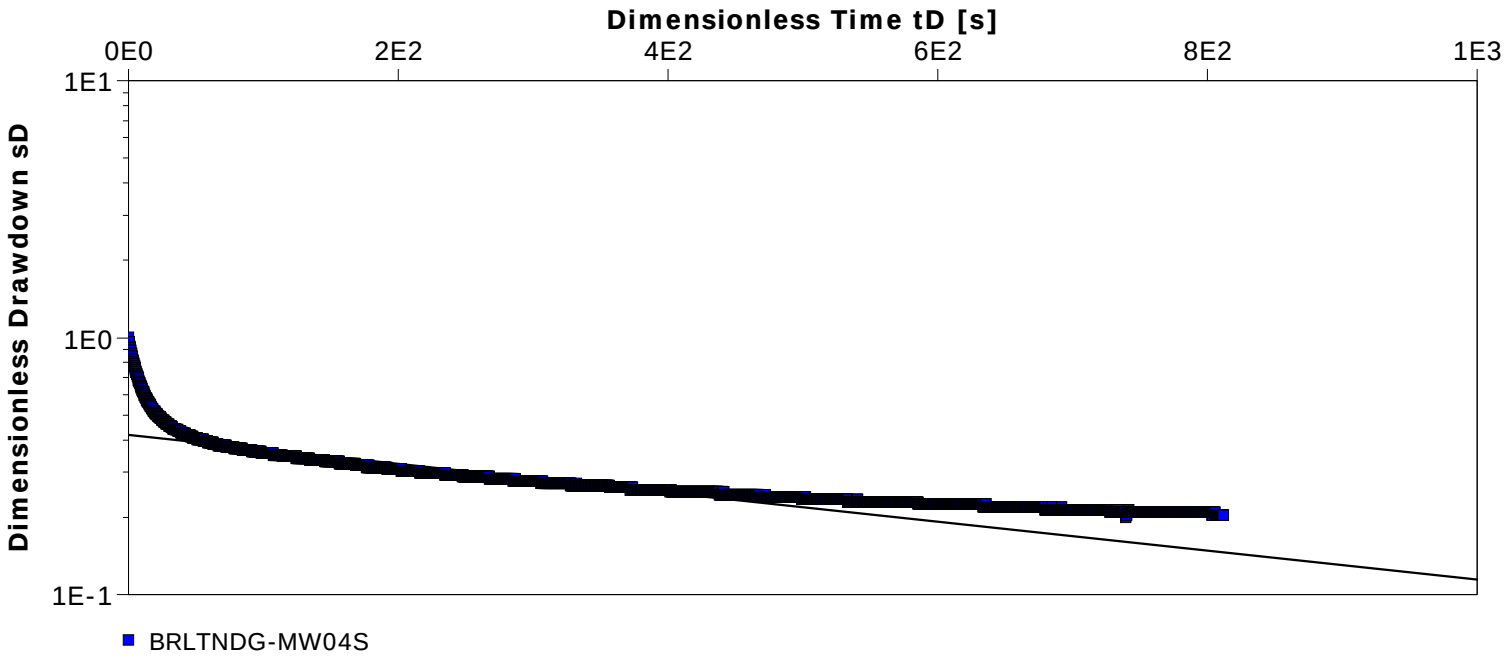


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [cm/s]	
BRLTNDG-MW04S	2.29×10^{-5}	

PARSONS **Burlington ANGB PFAS ESI South Burlington, VT**	**Slug Test Analysis Report**	
	Project: ANG PFAS ESI	
	Number: Burlington ANGB	
	Client: ANG	

Location: Burlington, VT	Slug Test: BRLTNDG-MW04S	Test Well: BRLTNDG-MW04S
Test Conducted by: Parsons		Test Date: 7/15/2019
Analysis Performed by:	New analysis 1	Analysis Date: 9/23/2019
Aquifer Thickness: 40.00 ft		

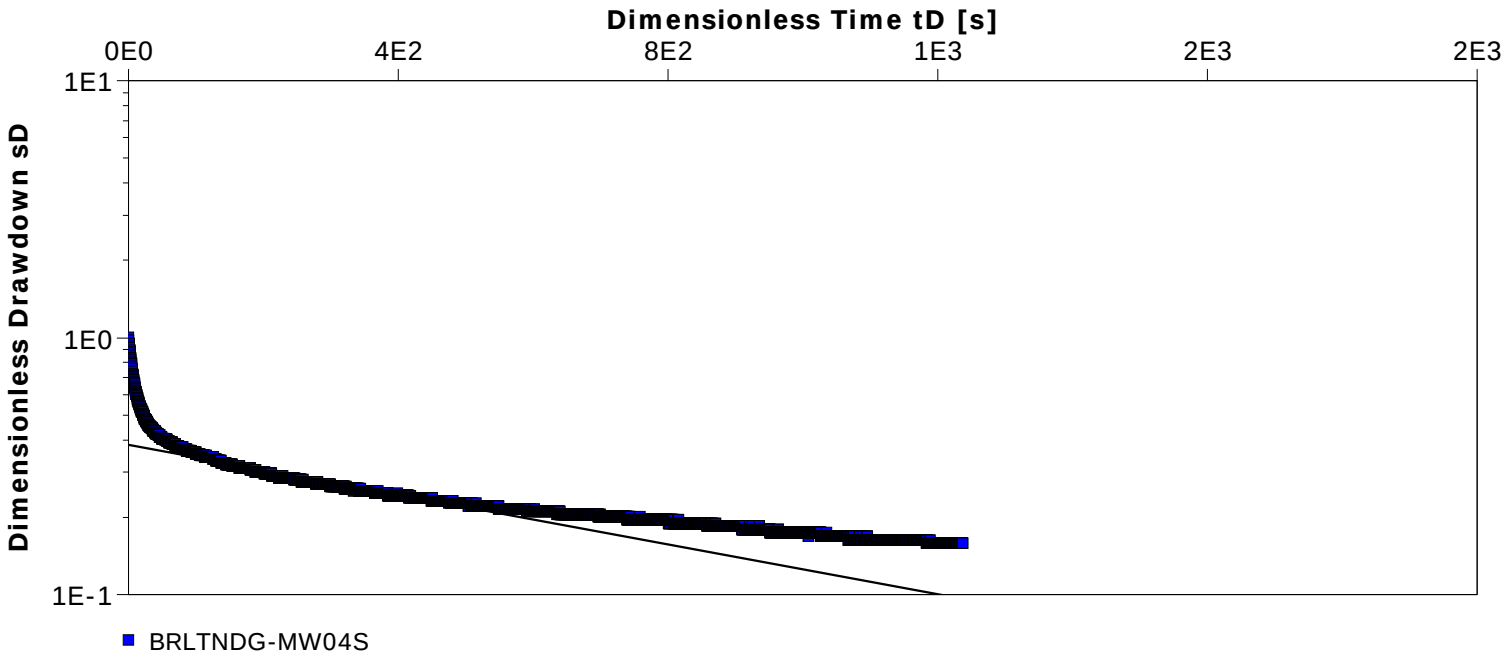


Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [cm/s]	
BRLTNDG-MW04S	5.11×10^{-5}	

PARSONS **Burlington ANGB PFAS ESI South Burlington, VT**	**Slug Test Analysis Report**	
	Project: ANG PFAS ESI	
	Number: Burlington ANGB	
	Client: ANG	

Location: Burlington, VT	Slug Test: BRLTNDG-MW04S	Test Well: BRLTNDG-MW04S
Test Conducted by: Parsons		Test Date: 7/15/2019
Analysis Performed by:	New analysis 1	Analysis Date: 9/23/2019
Aquifer Thickness: 40.00 ft		



Calculation using Bouwer & Rice

Observation Well	Hydraulic Conductivity [cm/s]	
BRLTNDG-MW04S	4.39×10^{-5}	

APPENDIX H Surface Water Sampling Logs

SURFACE WATER SAMPLING RECORD

SITE NAME:	Burlington
PROJECT NUMBER:	100042.0052.110100.30001
SAMPLING DATE/TIME:	06/13/2019 12:57

WEATHER:

Temperature °F	Wind Speed mph	Wind Direction	Sky	Precipitation
68	4	NE	Mostly Cloudy	Rain

SAMPLERS:	Kylah Wyatt
SAMPLE ID:	BRLTNDG-001-SW-0.0-0.1
SAMPLING METHOD:	sample bottle

DESCRIPTION OF SAMPLING POINT

OBSERVATIONS:	-
DEPTH TO BOTTOM:	0.1
FLOW DIRECTION:	W
UPSTREAM/DOWNSTREAN:	Downstream from ANGB
LAT/LONG:	44.4764442 / -73.1406882

SAMPLE DESCRIPTION

COLOR:	clear
ODOR:	none
SUSPENDED MATTER:	Not Turbid
OTHER:	-

FIELD TESTS

TEMPERATURE:	12.2	REDOX:	64
pH:	8.11	DISSOLVED O2:	9.88
CONDUCTIVITY:	0.316	TURBIDITY:	31.7

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

ANALYSIS:	PFAS (EPA 537 Modified)
QA/QC SAMPLE ID:	BRLTNDG-001-SW-0.0-0.1
DUPLICATE:	-
EB SAMPLE ID:	-
FB SAMPLE ID:	-
QA/QC ANALYSIS:	PFAS (EPA 537 Modified)
DATE/TIME REFRIGERATED:	06/13/2019 13:15
CHAIN OF CUSTODY NUMBER:	-
SHIPPED VIA:	-
LABORATORY:	Test America

COMMENTS / MISCELLANEOUS

Sample collected 40-50 ft upgradient of storm water culvert and tributary

SURFACE WATER SAMPLING RECORD

LOCATION PHOTO:



Caption:	-

SURFACE WATER SAMPLING RECORD

SITE NAME:	Burlington				
PROJECT NUMBER:	100042.0052.110100.30001				
SAMPLING DATE/TIME:	06/10/2019 10:20				
WEATHER:	**Temperature °F**	**Wind Speed mph**	**Wind Direction**	**Sky**	**Precipitation**
	71	4	S	Partly Cloudy	None
SAMPLERS:	Dan Chamberland, Aaron Sutton				
SAMPLE ID:	BRLTNDG-002-SW-0.0-0.0				
SAMPLING METHOD:	sample bottle				

DESCRIPTION OF SAMPLING POINT

OBSERVATIONS:	Just past the eddy in the predominant current is where sample was taken
DEPTH TO BOTTOM:	-
FLOW DIRECTION:	W
UPSTREAM/DOWNSTREAN:	Downstream from ANGB
LAT/LONG:	44.4792654 / -73.1433092

SAMPLE DESCRIPTION

COLOR:	clear
ODOR:	none
SUSPENDED MATTER:	Not Turbid
OTHER:	-

FIELD TESTS

TEMPERATURE:	17.4	REDOX:	193.6
pH:	7.99	DISSOLVED O2:	10.49
CONDUCTIVITY:	0.207	TURBIDITY:	12.9

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

ANALYSIS:	PFAS (EPA 537 Modified)
QA/QC SAMPLE ID:	BRLTNDG-002-SW-0.0-0.0
DUPLICATE:	-
EB SAMPLE ID:	-
FB SAMPLE ID:	-
QA/QC ANALYSIS:	PFAS (EPA 537 Modified)
DATE/TIME REFRIGERATED:	06/10/2019 10:20
CHAIN OF CUSTODY NUMBER:	-
SHIPPED VIA:	-
LABORATORY:	Test America

COMMENTS / MISCELLANEOUS

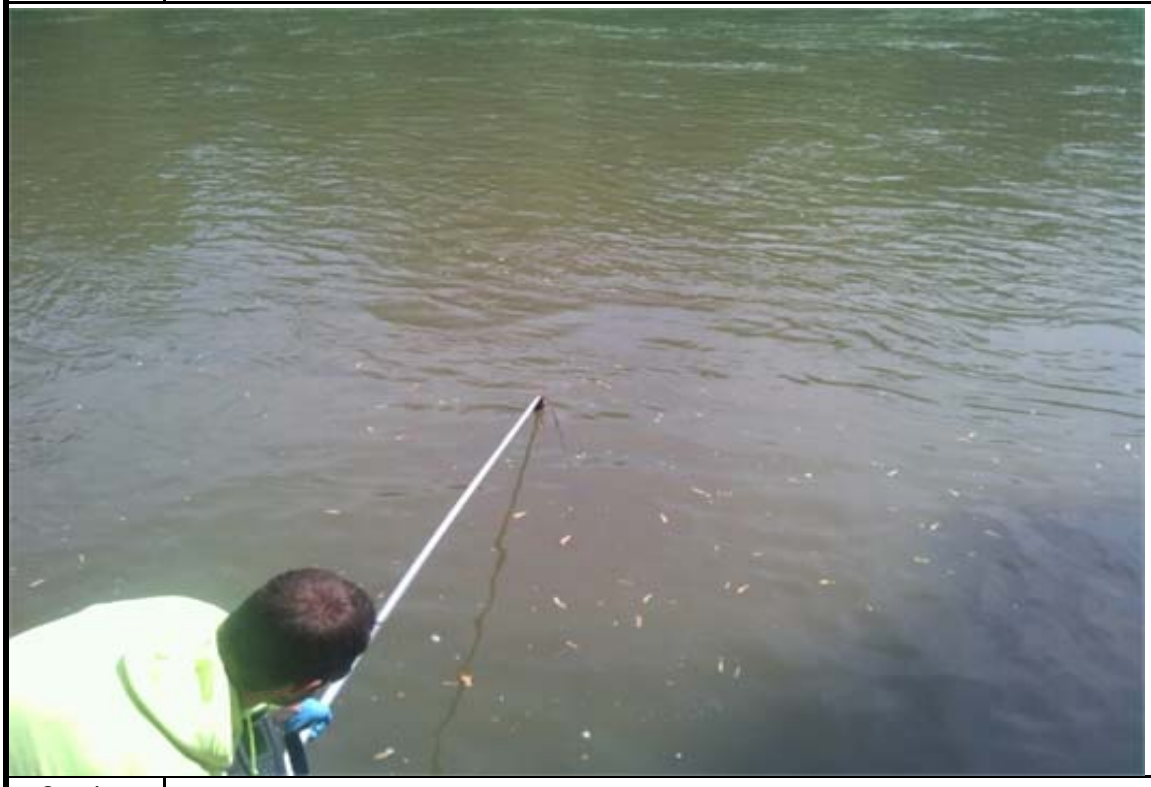
-

SURFACE WATER SAMPLING RECORD

SAMPLE PHOTO:



Caption:	-



Caption:	-

SURFACE WATER SAMPLING RECORD

SITE NAME:	Burlington
PROJECT NUMBER:	100042.0052.110100.30001
SAMPLING DATE/TIME:	06/13/2019 12:31

WEATHER:

Temperature °F	Wind Speed mph	Wind Direction	Sky	Precipitation
68	2	SE	Mostly Cloudy	None

SAMPLERS:	Kylah Wyatt
SAMPLE ID:	BRLTNDG-003-SW-0.0-0.1
SAMPLING METHOD:	sample bottle

DESCRIPTION OF SAMPLING POINT

OBSERVATIONS:	Slow flowing, shallow seep
DEPTH TO BOTTOM:	0.1
FLOW DIRECTION:	N
UPSTREAM/DOWNSTREAN:	Downstream from ANGB
LAT/LONG:	44.4784414 / -73.1434873

SAMPLE DESCRIPTION

COLOR:	clear
ODOR:	none
SUSPENDED MATTER:	Not Turbid
OTHER:	-

FIELD TESTS

TEMPERATURE:	12.3	REDOX:	58.3
pH:	8.25	DISSOLVED O2:	8.91
CONDUCTIVITY:	0.489	TURBIDITY:	11.5

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

ANALYSIS:	PFAS (EPA 537 Modified)
QA/QC SAMPLE ID:	BRLTNDG-003-SW-0.0-0.1
DUPLICATE:	-
EB SAMPLE ID:	-
FB SAMPLE ID:	-
QA/QC ANALYSIS:	PFAS (EPA 537 Modified)
DATE/TIME REFRIGERATED:	06/13/2019 13:20
CHAIN OF CUSTODY NUMBER:	-
SHIPPED VIA:	-
LABORATORY:	Test America

COMMENTS / MISCELLANEOUS

-

SURFACE WATER SAMPLING RECORD

SAMPLE PHOTO:



Caption:	-

LOCATION PHOTO:



Caption:	-

SURFACE WATER SAMPLING RECORD

SITE NAME:	Burlington
PROJECT NUMBER:	100042.0052.110100.30001
SAMPLING DATE/TIME:	06/13/2019 11:22

WEATHER:

Temperature °F	Wind Speed mph	Wind Direction	Sky	Precipitation
68	0	SE	Mostly Cloudy	None

SAMPLERS:	Kylah Wyatt
SAMPLE ID:	BRLTNDG-004-SW-0.0-0.1
SAMPLING METHOD:	sample bottle

DESCRIPTION OF SAMPLING POINT

OBSERVATIONS:	Shallow, slow moving, turbid
DEPTH TO BOTTOM:	0.1
FLOW DIRECTION:	W
UPSTREAM/DOWNSTREAN:	Downstream from ANGB
LAT/LONG:	44.4786201 / -73.1442541

SAMPLE DESCRIPTION

COLOR:	clear
ODOR:	none
SUSPENDED MATTER:	Turbid
OTHER:	-

FIELD TESTS

TEMPERATURE:	11.9	REDOX:	80.5
pH:	7.96	DISSOLVED O2:	8.33
CONDUCTIVITY:	0.56	TURBIDITY:	35.5

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

ANALYSIS:	PFAS (EPA 537 Modified)
QA/QC SAMPLE ID:	BRLTNDG-004-SW-0.0-0.1
DUPLICATE:	-
EB SAMPLE ID:	-
FB SAMPLE ID:	-
QA/QC ANALYSIS:	PFAS (EPA 537 Modified)
DATE/TIME REFRIGERATED:	06/13/2019 13:20
CHAIN OF CUSTODY NUMBER:	-
SHIPPED VIA:	-
LABORATORY:	Test America

COMMENTS / MISCELLANEOUS

-

SURFACE WATER SAMPLING RECORD

SAMPLE PHOTO:



Caption:	-

LOCATION PHOTO:



Caption:	-

SURFACE WATER SAMPLING RECORD

SITE NAME:	Burlington
PROJECT NUMBER:	100042.0052.110100.30001
SAMPLING DATE/TIME:	6/13/2019 12:11

WEATHER:

Temperature °F	Wind Speed mph	Wind Direction	Sky	Precipitation
-	-	-	-	-

SAMPLERS:	Kylah Wyatt
SAMPLE ID:	BRLTNDG-005-SW
SAMPLING METHOD:	sample bottle

DESCRIPTION OF SAMPLING POINT

OBSERVATIONS:	Shallow, slow moving stream
DEPTH TO BOTTOM:	0.1
FLOW DIRECTION:	N
UPSTREAM/DOWNSTREAN:	Downstream from ANGB
LAT/LONG:	44.4787698 / -73.1447933

SAMPLE DESCRIPTION

COLOR:	Clear
ODOR:	-
SUSPENDED MATTER:	some
OTHER:	-

FIELD TESTS

TEMPERATURE:	11.9	REDOX:	80.5
pH:	7.96	DISSOLVED O2:	8.33
CONDUCTIVITY:	0.56	TURBIDITY:	35.5

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

ANALYSIS:	PFAS (EPA 537 Modified)
QA/QC SAMPLE ID:	BRLTNDG-005-SW-0.0-0.1
DUPLICATE:	-
EB SAMPLE ID:	-
FB SAMPLE ID:	-
QA/QC ANALYSIS:	PFAS (EPA 537 Modified)
DATE/TIME REFRIGERATED:	-
CHAIN OF CUSTODY NUMBER:	-
SHIPPED VIA:	-
LABORATORY:	Test America

COMMENTS / MISCELLANEOUS

-

SURFACE WATER SAMPLING RECORD

SITE NAME:	Burlington
PROJECT NUMBER:	100042.0052.110100.30001
SAMPLING DATE/TIME:	06/13/2019 11:41

WEATHER:

Temperature °F	Wind Speed mph	Wind Direction	Sky	Precipitation
68	1	SE	Mostly Cloudy	None

SAMPLERS:	Kylah Wyatt
SAMPLE ID:	BRLTNDG-006-SW-0.0-0.2
SAMPLING METHOD:	sample bottle

DESCRIPTION OF SAMPLING POINT

OBSERVATIONS:	Shallow, steady flow
DEPTH TO BOTTOM:	0.2
FLOW DIRECTION:	N
UPSTREAM/DOWNSTREAN:	Downstream from ANGB
LAT/LONG:	44.4785468 / -73.1448172

SAMPLE DESCRIPTION

COLOR:	clear
ODOR:	none
SUSPENDED MATTER:	Not Turbid
OTHER:	-

FIELD TESTS

TEMPERATURE:	8.8	REDOX:	102.4
pH:	7.44	DISSOLVED O2:	8.04
CONDUCTIVITY:	0.78	TURBIDITY:	9.6

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

ANALYSIS:	PFAS (EPA 537 Modified)
QA/QC SAMPLE ID:	BRLTNDG-006-SW-0.0-0.2
DUPLICATE:	-
EB SAMPLE ID:	-
FB SAMPLE ID:	-
QA/QC ANALYSIS:	PFAS (EPA 537 Modified)
DATE/TIME REFRIGERATED:	06/13/2019 13:20
CHAIN OF CUSTODY NUMBER:	-
SHIPPED VIA:	-
LABORATORY:	Test America

COMMENTS / MISCELLANEOUS

-

SURFACE WATER SAMPLING RECORD

SAMPLE PHOTO:



Caption:	-

LOCATION PHOTO:



Caption:	-

SURFACE WATER SAMPLING RECORD

SITE NAME:	BRLTNDG-007-SW
PROJECT NUMBER:	100042.0052.110100.30001
SAMPLING DATE/TIME:	06/13/2019 15:27

WEATHER:

Temperature °F	Wind Speed mph	Wind Direction	Sky	Precipitation
69	5	N	Partly Cloudy	None

SAMPLERS:	Aaron Sutton, Kylah Wyatt
SAMPLE ID:	BRLTNDG-007-SW
SAMPLING METHOD:	-

DESCRIPTION OF SAMPLING POINT

OBSERVATIONS:	Location could not be reached due to steep and overgrown
DEPTH TO BOTTOM:	-
FLOW DIRECTION:	-
UPSTREAM/DOWNSTREAN:	-
LAT/LONG:	-

SAMPLE DESCRIPTION

COLOR:	-
ODOR:	-
SUSPENDED MATTER:	-
OTHER:	-

FIELD TESTS

TEMPERATURE:	-	REDOX:	-
pH:	-	DISSOLVED O2:	-
CONDUCTIVITY:	-	TURBIDITY:	-

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

ANALYSIS:	-
QA/QC SAMPLE ID:	BRLTNDG-007-SW
DUPLICATE:	-
EB SAMPLE ID:	-
FB SAMPLE ID:	-
QA/QC ANALYSIS:	PFAS (EPA 537 Modified)
DATE/TIME REFRIGERATED:	06/14/2019 20:27
CHAIN OF CUSTODY NUMBER:	-
SHIPPED VIA:	-
LABORATORY:	-

COMMENTS / MISCELLANEOUS

Location could not be reached due to steep and overgrown ravine. Location dropped from sampling program.

SURFACE WATER SAMPLING RECORD

SITE NAME:	Burlington
PROJECT NUMBER:	100042.0052.110100.30001
SAMPLING DATE/TIME:	6/13/2019 9:51

WEATHER:

Temperature °F	Wind Speed mph	Wind Direction	Sky	Precipitation
62	5	N	Overcast	None

SAMPLERS:	Aaron Sutton and Kylah Wyatt
SAMPLE ID:	BRLTNDG-008-SW-0-0
SAMPLING METHOD:	sample bottle

DESCRIPTION OF SAMPLING POINT

OBSERVATIONS:	Collected outfall from culvert as it cascaded into pool.
DEPTH TO BOTTOM:	0.8
FLOW DIRECTION:	N
UPSTREAM/DOWNSTREAM:	Downstream from ANGB
LAT/LONG:	44.478666/-73.1487972

SAMPLE DESCRIPTION

COLOR:	clear
ODOR:	none
SUSPENDED MATTER:	Not Turbid
OTHER:	-

FIELD TESTS

TEMPERATURE:	13.70	REDOX:	-62.10
pH:	7.67	DISSOLVED O2:	8.61
CONDUCTIVITY:	0.630	TURBIDITY:	11.0

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

ANALYSIS:	PFAS (EPA 537 Modified)
QA/QC SAMPLE ID:	BRLTNDG-008-SW-0-0
DUPLICATE:	BRLTNDG-908-SW-0-0
EB SAMPLE ID:	-
FB SAMPLE ID:	-
QA/QC ANALYSIS:	PFAS (EPA 537 Modified)
DATE/TIME REFRIGERATED:	6/13/2019 9:51
CHAIN OF CUSTODY NUMBER:	-
SHIPPED VIA:	-
LABORATORY:	Test America

COMMENTS / MISCELLANEOUS

All dedicated equipment used, no EB

SURFACE WATER SAMPLING RECORD

LOCATION PHOTO:



Caption:	-

SURFACE WATER SAMPLING RECORD

SITE NAME:	Burlington
PROJECT NUMBER:	100042.0052.110100.30001
SAMPLING DATE/TIME:	6/13/2019 8:59

WEATHER:

Temperature °F	Wind Speed mph	Wind Direction	Sky	Precipitation
65	1	SE	Mostly Cloudy	None

SAMPLERS:	Kylah Wyatt
SAMPLE ID:	BRLTNDG-009-SW-0-0.1
SAMPLING METHOD:	sample bottle

DESCRIPTION OF SAMPLING POINT

OBSERVATIONS:	Very shallow stream
DEPTH TO BOTTOM:	0.1
FLOW DIRECTION:	NE
UPSTREAM/DOWNSTREAM:	Downstream from ANGB
LAT/LONG:	44.4795717/-73.157069

SAMPLE DESCRIPTION

COLOR:	clear
ODOR:	none
SUSPENDED MATTER:	Not Turbid
OTHER:	Bubbles in stream

FIELD TESTS

TEMPERATURE:	13.10	REDOX:	22.70
pH:	8.13	DISSOLVED O2:	3.31
CONDUCTIVITY:	0.146	TURBIDITY:	26.4

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

ANALYSIS:	PFAS (EPA 537 Modified)
QA/QC SAMPLE ID:	BRLTNDG-009-SW-0-0.1
DUPLICATE:	-
EB SAMPLE ID:	-
FB SAMPLE ID:	-
QA/QC ANALYSIS:	PFAS (EPA 537 Modified)
DATE/TIME REFRIGERATED:	6/13/2019 8:59
CHAIN OF CUSTODY NUMBER:	-
SHIPPED VIA:	-
LABORATORY:	Test America

COMMENTS / MISCELLANEOUS

-

SURFACE WATER SAMPLING RECORD

LOCATION PHOTO:



Caption:	-

SURFACE WATER SAMPLING RECORD

SITE NAME:	Burlington
PROJECT NUMBER:	100042.0052.110100.30001
SAMPLING DATE/TIME:	6/13/2019 8:32

WEATHER:

Temperature °F	Wind Speed mph	Wind Direction	Sky	Precipitation
65	1	SE	Mostly Cloudy	None

SAMPLERS:	Kylah Wyatt
SAMPLE ID:	BRLTNDG-010-SW-0-0.3
SAMPLING METHOD:	sample bottle

DESCRIPTION OF SAMPLING POINT

OBSERVATIONS:	-
DEPTH TO BOTTOM:	0.3
FLOW DIRECTION:	W
UPSTREAM/DOWNSTREAM:	Downstream from ANGB
LAT/LONG:	44.4797452/-73.1576347

SAMPLE DESCRIPTION

COLOR:	clear
ODOR:	none
SUSPENDED MATTER:	Not Turbid
OTHER:	-

FIELD TESTS

TEMPERATURE:	12.20	REDOX:	42.30
pH:	8.28	DISSOLVED O2:	9.39
CONDUCTIVITY:	0.297	TURBIDITY:	66.9

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

ANALYSIS:	PFAS (EPA 537 Modified)
QA/QC SAMPLE ID:	BRLTNDG-010-SW-0-0.3
DUPLICATE:	-
EB SAMPLE ID:	-
FB SAMPLE ID:	-
QA/QC ANALYSIS:	PFAS (EPA 537 Modified)
DATE/TIME REFRIGERATED:	6/13/2019 8:32
CHAIN OF CUSTODY NUMBER:	-
SHIPPED VIA:	-
LABORATORY:	Test America

COMMENTS / MISCELLANEOUS

MS/MSD collected here.

SURFACE WATER SAMPLING RECORD

LOCATION PHOTO:



Caption:	-

SURFACE WATER SAMPLING RECORD

SITE NAME:	Burlington
PROJECT NUMBER:	100042.0052.110100.30001
SAMPLING DATE/TIME:	06/10/2019 14:47

WEATHER:

Temperature °F	Wind Speed mph	Wind Direction	Sky	Precipitation
68	8	NE	Partly Cloudy	None

SAMPLERS:	Dan Chamberland, Aaron Sutton
SAMPLE ID:	BRLTNDG-011-SW
SAMPLING METHOD:	sample bottle

DESCRIPTION OF SAMPLING POINT

OBSERVATIONS:	Slow moving water
DEPTH TO BOTTOM:	0.3
FLOW DIRECTION:	NW
UPSTREAM/DOWNSTREAN:	Downstream from ANGB
LAT/LONG:	44.480317 / -73.1575086

SAMPLE DESCRIPTION

COLOR:	clear
ODOR:	none
SUSPENDED MATTER:	Not Turbid
OTHER:	-

FIELD TESTS

TEMPERATURE:	12.6	REDOX:	62
pH:	6.33	DISSOLVED O2:	2.88
CONDUCTIVITY:	0.343	TURBIDITY:	17.2

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

ANALYSIS:	PFAS (EPA 537 Modified)
QA/QC SAMPLE ID:	BRLTNDG-011-SW
DUPLICATE:	-
EB SAMPLE ID:	-
FB SAMPLE ID:	-
QA/QC ANALYSIS:	PFAS (EPA 537 Modified)
DATE/TIME REFRIGERATED:	06/10/2019 02:50
CHAIN OF CUSTODY NUMBER:	-
SHIPPED VIA:	-
LABORATORY:	Test America

COMMENTS / MISCELLANEOUS

Water parameters collected at a later date to rectify form missubmission.

SURFACE WATER SAMPLING RECORD

LOCATION PHOTO:



Caption:	-

SURFACE WATER SAMPLING RECORD

SITE NAME:	Burlington
PROJECT NUMBER:	100042.0052.110100.30001
SAMPLING DATE/TIME:	06/10/2019 14:32

WEATHER:

Temperature °F	Wind Speed mph	Wind Direction	Sky	Precipitation
68	7	NE	Partly Cloudy	None

SAMPLERS:	Dan Chamberland, Aaron Sutton
SAMPLE ID:	BRLTNDG-012-SW-0.0-0.5
SAMPLING METHOD:	sample bottle

DESCRIPTION OF SAMPLING POINT

OBSERVATIONS:	Slowly moving and shallow
DEPTH TO BOTTOM:	0.1
FLOW DIRECTION:	SW
UPSTREAM/DOWNSTREAN:	Downstream from ANGB
LAT/LONG:	44.4804223 / -73.1588662

SAMPLE DESCRIPTION

COLOR:	clear
ODOR:	none
SUSPENDED MATTER:	Not Turbid
OTHER:	-

FIELD TESTS

TEMPERATURE:	14.9	REDOX:	115.2
pH:	7.16	DISSOLVED O2:	7.94
CONDUCTIVITY:	0.33	TURBIDITY:	4.4

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

ANALYSIS:	PFAS (EPA 537 Modified)
QA/QC SAMPLE ID:	-0.0-0.5
DUPLICATE:	-
EB SAMPLE ID:	-
FB SAMPLE ID:	-
QA/QC ANALYSIS:	PFAS (EPA 537 Modified)
DATE/TIME REFRIGERATED:	06/10/2019 14:32
CHAIN OF CUSTODY NUMBER:	-
SHIPPED VIA:	-
LABORATORY:	Test America

COMMENTS / MISCELLANEOUS

-

SURFACE WATER SAMPLING RECORD

LOCATION PHOTO:



Caption:	-

SURFACE WATER SAMPLING RECORD

SITE NAME:	Burlington
PROJECT NUMBER:	100042.0052.110100.30001
SAMPLING DATE/TIME:	06/13/2019 08:47

WEATHER:

Temperature °F	Wind Speed mph	Wind Direction	Sky	Precipitation
65	1	SE	Mostly Cloudy	None

SAMPLERS:	Kylah Wyatt
SAMPLE ID:	BRLTNDG-013-SW-0.0-0.3
SAMPLING METHOD:	sample bottle

DESCRIPTION OF SAMPLING POINT

OBSERVATIONS:	-
DEPTH TO BOTTOM:	-
FLOW DIRECTION:	N
UPSTREAM/DOWNSTREAN:	Downstream from ANGB
LAT/LONG:	44.479659 / -73.1574091

SAMPLE DESCRIPTION

COLOR:	clear
ODOR:	none
SUSPENDED MATTER:	Not Turbid
OTHER:	-

FIELD TESTS

TEMPERATURE:	12.2	REDOX:	6.6
pH:	8.37	DISSOLVED O2:	9.27
CONDUCTIVITY:	0.295	TURBIDITY:	9.4

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

ANALYSIS:	PFAS (EPA 537 Modified)
QA/QC SAMPLE ID:	-0.0-0.3
DUPLICATE:	-
EB SAMPLE ID:	-
FB SAMPLE ID:	-
QA/QC ANALYSIS:	PFAS (EPA 537 Modified)
DATE/TIME REFRIGERATED:	06/13/2019 09:20
CHAIN OF CUSTODY NUMBER:	-
SHIPPED VIA:	-
LABORATORY:	Test America

COMMENTS / MISCELLANEOUS

-

SURFACE WATER SAMPLING RECORD

LOCATION PHOTO:



Caption:	-

SURFACE WATER SAMPLING RECORD

SITE NAME:	Burlington
PROJECT NUMBER:	100042.0052.110100.30001
SAMPLING DATE/TIME:	06/10/2019 11:47

WEATHER:

Temperature °F	Wind Speed mph	Wind Direction	Sky	Precipitation
70	5	W	Partly Cloudy	None

SAMPLERS:	Dan Chamberland, Aaron Sutton
SAMPLE ID:	BRLTNDG-014-SW-0.0-0.5
SAMPLING METHOD:	sample bottle

DESCRIPTION OF SAMPLING POINT

OBSERVATIONS:	-
DEPTH TO BOTTOM:	0.8
FLOW DIRECTION:	NE
UPSTREAM/DOWNSTREAN:	Downstream from ANGB
LAT/LONG:	44.4776139 / -73.1405614

SAMPLE DESCRIPTION

COLOR:	clear
ODOR:	none
SUSPENDED MATTER:	Not Turbid
OTHER:	Foaming in the drainage running to the river

FIELD TESTS

TEMPERATURE:	9	REDOX:	132.9
pH:	7.18	DISSOLVED O2:	12.4
CONDUCTIVITY:	0.51	TURBIDITY:	3.7

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

ANALYSIS:	PFAS (EPA 537 Modified)
QA/QC SAMPLE ID:	BRLTNDG-014-SW-0.0-0.5
DUPLICATE:	-
EB SAMPLE ID:	-
FB SAMPLE ID:	-
QA/QC ANALYSIS:	PFAS (EPA 537 Modified)
DATE/TIME REFRIGERATED:	06/10/2019 12:20
CHAIN OF CUSTODY NUMBER:	-
SHIPPED VIA:	-
LABORATORY:	Test America

COMMENTS / MISCELLANEOUS

Water parameters collected at a later date.

SURFACE WATER SAMPLING RECORD

LOCATION PHOTO:



Caption:	-

SURFACE WATER SAMPLING RECORD

SITE NAME:	Burlington
PROJECT NUMBER:	100042.0052.110100.30001
SAMPLING DATE/TIME:	7/9/2019 12:30

WEATHER:

Temperature °F	Wind Speed mph	Wind Direction	Sky	Precipitation

SAMPLERS:	Aaron Sutton, Kylah Wyatt
SAMPLE ID:	BRLTNDG-015-SW
SAMPLING METHOD:	sample bottle

DESCRIPTION OF SAMPLING POINT

OBSERVATIONS:	North bank of river, at the alfalfa farm
DEPTH TO BOTTOM:	5
FLOW DIRECTION:	NW
UPSTREAM/DOWNSTREAN:	Downstream from ANGB
LAT/LONG:	44.4786 / -73.1416

SAMPLE DESCRIPTION

COLOR:	clear
ODOR:	none
SUSPENDED MATTER:	none
OTHER:	-

FIELD TESTS

TEMPERATURE:	23.4	REDOX:	-61.9
pH:	7.71	DISSOLVED O2:	7.18
CONDUCTIVITY:	0.242	TURBIDITY:	0

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

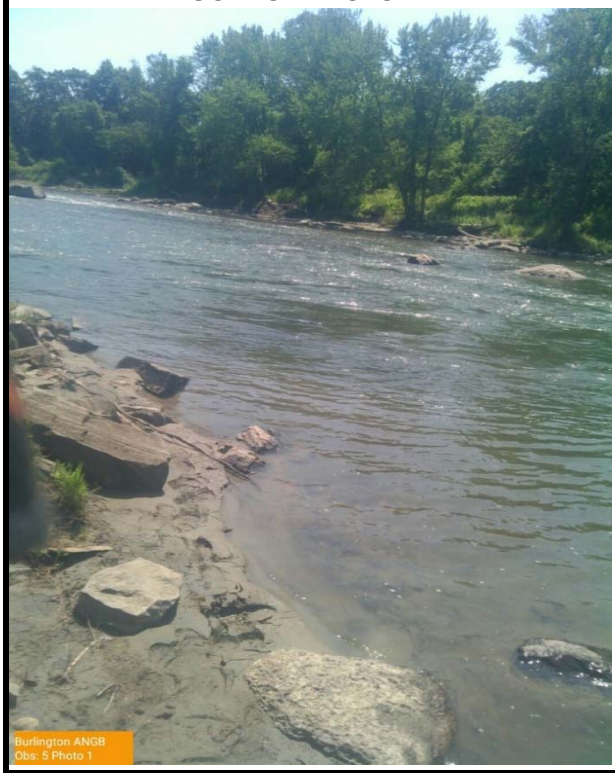
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QA/QC SAMPLE ID:	BRLTNDG-015-SW-0.0-1.5
DUPLICATE:	BRLTNDG-915-SW-0.0-1.5
EB SAMPLE ID:	-
FB SAMPLE ID:	-
QA/QC ANALYSIS:	PFAS (EPA 537 Modified)
DATE/TIME REFRIGERATED:	-
CHAIN OF CUSTODY NUMBER:	-
SHIPPED VIA:	-
LABORATORY:	Test America

COMMENTS / MISCELLANEOUS

-

SURFACE WATER SAMPLING RECORD

LOCATION PHOTO:



Caption:	-

SURFACE WATER SAMPLING RECORD

SITE NAME:	Burlington
PROJECT NUMBER:	100042.0052.110100.30001
SAMPLING DATE/TIME:	7/8/2019 13:40:00 PM

WEATHER:

Temperature °F	Wind Speed mph	Wind Direction	Sky	Precipitation
-	-	-	-	-

SAMPLERS:	Kylah Wyatt, Jessica Click
SAMPLE ID:	BRLTNDG-016-SW
SAMPLING METHOD:	sample bottle

DESCRIPTION OF SAMPLING POINT

OBSERVATIONS:	West side of river, on a protrusion of rock.
DEPTH TO BOTTOM:	-
FLOW DIRECTION:	N
UPSTREAM/DOWNSTREAN:	Downstream from ANGB
LAT/LONG:	44.4833 / -73.1449

SAMPLE DESCRIPTION

COLOR:	Clear
ODOR:	-
SUSPENDED MATTER:	none
OTHER:	-

FIELD TESTS

TEMPERATURE:	23	REDOX:	11.9
pH:	8.03	DISSOLVED O2:	12.71
CONDUCTIVITY:	0.196	TURBIDITY:	6.72

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

ANALYSIS:	PFAS (EPA 537 Modified)
QA/QC SAMPLE ID:	BRLTNDG-016-SW-0.0-1.0
DUPLICATE:	-
EB SAMPLE ID:	-
FB SAMPLE ID:	-
QA/QC ANALYSIS:	PFAS (EPA 537 Modified)
DATE/TIME REFRIGERATED:	-
CHAIN OF CUSTODY NUMBER:	-
SHIPPED VIA:	-
LABORATORY:	Test America

COMMENTS / MISCELLANEOUS

Sample collected on an island in the river, on the side facing the bank of the river. River flowing on both sides of the island.

SURFACE WATER SAMPLING RECORD

SITE NAME:	Burlington
PROJECT NUMBER:	100042.0052.110100.30001
SAMPLING DATE/TIME:	7/8/2019 13:00:00 PM

WEATHER:

Temperature °F	Wind Speed mph	Wind Direction	Sky	Precipitation
-	-	-	-	-

SAMPLERS:	Kylah Wyatt, Jessica Click
SAMPLE ID:	BRLTNDG-017-SW
SAMPLING METHOD:	sample bottle

DESCRIPTION OF SAMPLING POINT

OBSERVATIONS:	Sandy river bank
DEPTH TO BOTTOM:	2
FLOW DIRECTION:	N
UPSTREAM/DOWNSTREAN:	Downstream from ANGB
LAT/LONG:	44.4875 / -73.1440

SAMPLE DESCRIPTION

COLOR:	Clear
ODOR:	-
SUSPENDED MATTER:	none
OTHER:	-

FIELD TESTS

TEMPERATURE:	23.2	REDOX:	20.6
pH:	7.94	DISSOLVED O2:	12.85
CONDUCTIVITY:	0.197	TURBIDITY:	5.87

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

ANALYSIS:	PFAS (EPA 537 Modified)
QA/QC SAMPLE ID:	BRLTNDG-017-SW-0.0-1.0
DUPLICATE:	-
EB SAMPLE ID:	-
FB SAMPLE ID:	-
QA/QC ANALYSIS:	PFAS (EPA 537 Modified)
DATE/TIME REFRIGERATED:	-
CHAIN OF CUSTODY NUMBER:	-
SHIPPED VIA:	-
LABORATORY:	Test America

COMMENTS / MISCELLANEOUS

Collected MS/MSD

SURFACE WATER SAMPLING RECORD

SITE NAME:	Burlington
PROJECT NUMBER:	100042.0052.110100.30001
SAMPLING DATE/TIME:	7/8/2019 12:15

WEATHER:

Temperature °F	Wind Speed mph	Wind Direction	Sky	Precipitation
-	-	-	-	-

SAMPLERS:	Kylah Wyatt, Jessica Click
SAMPLE ID:	BRLTNDG-018-SW
SAMPLING METHOD:	sample bottle

DESCRIPTION OF SAMPLING POINT

OBSERVATIONS:	Grassy river bank
DEPTH TO BOTTOM:	3
FLOW DIRECTION:	SW
UPSTREAM/DOWNSTREAN:	Downstream from ANGB
LAT/LONG:	44.4877 / -73.1644

SAMPLE DESCRIPTION

COLOR:	Clear
ODOR:	-
SUSPENDED MATTER:	none
OTHER:	-

FIELD TESTS

TEMPERATURE:	22	REDOX:	19.6
pH:	7.79	DISSOLVED O2:	11.65
CONDUCTIVITY:	0.201	TURBIDITY:	4.76

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

ANALYSIS:	PFAS (EPA 537 Modified)
QA/QC SAMPLE ID:	BRLTNDG-018-SW-0.0-1.5
DUPLICATE:	BRLTNDG-918-SW-0.0-1.5
EB SAMPLE ID:	-
FB SAMPLE ID:	-
QA/QC ANALYSIS:	PFAS (EPA 537 Modified)
DATE/TIME REFRIGERATED:	-
CHAIN OF CUSTODY NUMBER:	-
SHIPPED VIA:	-
LABORATORY:	Test America

COMMENTS / MISCELLANEOUS

-

SURFACE WATER SAMPLING RECORD

SITE NAME:	Burlington
PROJECT NUMBER:	100042.0052.110100.30001
SAMPLING DATE/TIME:	7/9/2019 9:00

WEATHER:

Temperature °F	Wind Speed mph	Wind Direction	Sky	Precipitation
-	-	-	-	-

SAMPLERS:	Aaron Sutton, Kylah Wyatt
SAMPLE ID:	BRLTNDG-019-SW
SAMPLING METHOD:	sample bottle

DESCRIPTION OF SAMPLING POINT

OBSERVATIONS:	Shallow seep on north side of National Guard Ave
DEPTH TO BOTTOM:	0.25
FLOW DIRECTION:	N
UPSTREAM/DOWNSTREAN:	Downstream from ANGB
LAT/LONG:	44.4798 / -73.1560

SAMPLE DESCRIPTION

COLOR:	Clear
ODOR:	none
SUSPENDED MATTER:	cloudy, some particulates
OTHER:	-

FIELD TESTS

TEMPERATURE:	14.1	REDOX:	187
pH:	7.32	DISSOLVED O2:	5.75
CONDUCTIVITY:	0.252	TURBIDITY:	120

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

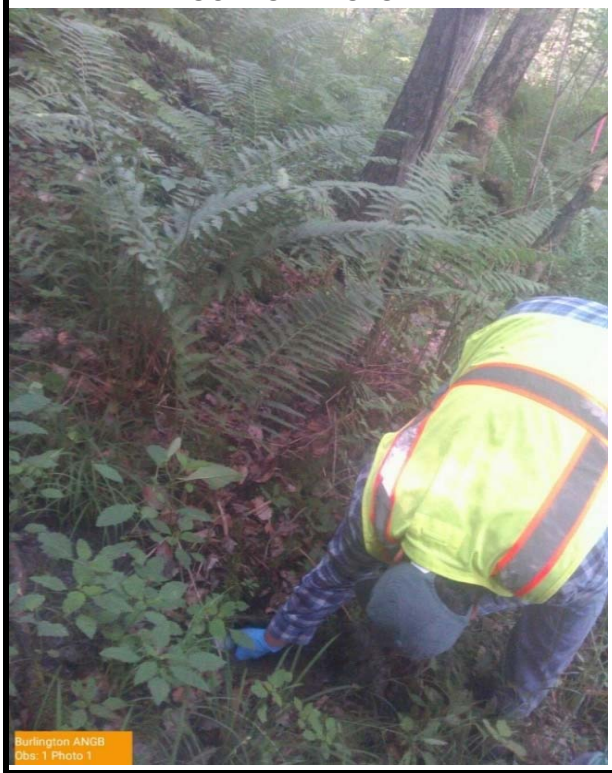
ANALYSIS:	PFAS (EPA 537 Modified)
QA/QC SAMPLE ID:	BRLTNDG-019-SW-0.0-0.25
DUPLICATE:	-
EB SAMPLE ID:	-
FB SAMPLE ID:	-
QA/QC ANALYSIS:	PFAS (EPA 537 Modified)
DATE/TIME REFRIGERATED:	-
CHAIN OF CUSTODY NUMBER:	-
SHIPPED VIA:	-
LABORATORY:	Test America

COMMENTS / MISCELLANEOUS

-

SURFACE WATER SAMPLING RECORD

LOCATION PHOTO:



Caption:	

SURFACE WATER SAMPLING RECORD

SITE NAME:	Burlington
PROJECT NUMBER:	100042.0052.110100.30001
SAMPLING DATE/TIME:	7/9/2019 9:10

WEATHER:

Temperature °F	Wind Speed mph	Wind Direction	Sky	Precipitation

SAMPLERS:	Aaron Sutton, Kylah Wyatt
SAMPLE ID:	BRLTNDG-020-SW
SAMPLING METHOD:	sample bottle

DESCRIPTION OF SAMPLING POINT

OBSERVATIONS:	Shallow seep on north side of National Guard Ave
DEPTH TO BOTTOM:	0.1
FLOW DIRECTION:	N
UPSTREAM/DOWNSTREAN:	Downstream from ANGB
LAT/LONG:	44.4800 / -73.1557

SAMPLE DESCRIPTION

COLOR:	Clear
ODOR:	none
SUSPENDED MATTER:	none
OTHER:	-

FIELD TESTS

TEMPERATURE:	11.5	REDOX:	160.1
pH:	7.32	DISSOLVED O2:	6.57
CONDUCTIVITY:	0.159	TURBIDITY:	24.4

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

ANALYSIS:	PFAS (EPA 537 Modified)
QA/QC SAMPLE ID:	BRLTNDG-020-SW-0.0-0.1
DUPLICATE:	-
EB SAMPLE ID:	-
FB SAMPLE ID:	-
QA/QC ANALYSIS:	PFAS (EPA 537 Modified)
DATE/TIME REFRIGERATED:	-
CHAIN OF CUSTODY NUMBER:	-
SHIPPED VIA:	-
LABORATORY:	Test America

COMMENTS / MISCELLANEOUS

-

SURFACE WATER SAMPLING RECORD

LOCATION PHOTO:



Caption:	-

SURFACE WATER SAMPLING RECORD

SITE NAME:	Burlington
PROJECT NUMBER:	100042.0052.110100.30001
SAMPLING DATE/TIME:	7/9/2019 9:25

WEATHER:

Temperature °F	Wind Speed mph	Wind Direction	Sky	Precipitation
-	-	-	-	-

SAMPLERS:	Aaron Sutton, Kylah Wyatt
SAMPLE ID:	BRLTNDG-021-SW
SAMPLING METHOD:	sample bottle

DESCRIPTION OF SAMPLING POINT

OBSERVATIONS:	Shallow seep on north side of National Guard Ave
DEPTH TO BOTTOM:	<0.1
FLOW DIRECTION:	N
UPSTREAM/DOWNSTREAN:	Downstream from ANGB
LAT/LONG:	44.4801 / -73.1544

SAMPLE DESCRIPTION

COLOR:	Clear
ODOR:	none
SUSPENDED MATTER:	none
OTHER:	-

FIELD TESTS

TEMPERATURE:	13.8	REDOX:	-16
pH:	7.1	DISSOLVED O2:	7.49
CONDUCTIVITY:	0.197	TURBIDITY:	7.95

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

ANALYSIS:	PFAS (EPA 537 Modified)
QA/QC SAMPLE ID:	BRLTNDG-021-SW-0.0-0.1
DUPLICATE:	-
EB SAMPLE ID:	-
FB SAMPLE ID:	-
QA/QC ANALYSIS:	PFAS (EPA 537 Modified)
DATE/TIME REFRIGERATED:	-
CHAIN OF CUSTODY NUMBER:	-
SHIPPED VIA:	-
LABORATORY:	Test America

COMMENTS / MISCELLANEOUS

-

SURFACE WATER SAMPLING RECORD

LOCATION PHOTO:



Caption:	-

SURFACE WATER SAMPLING RECORD

SITE NAME:	Burlington
PROJECT NUMBER:	100042.0052.110100.30001
SAMPLING DATE/TIME:	7/9/2019 9:40

WEATHER:

Temperature °F	Wind Speed mph	Wind Direction	Sky	Precipitation
-	-	-	-	-

SAMPLERS:	Aaron Sutton, Kylah Wyatt
SAMPLE ID:	BRLTNDG-022-SW
SAMPLING METHOD:	sample bottle

DESCRIPTION OF SAMPLING POINT

OBSERVATIONS:	Shallow seep near the dairy farm
DEPTH TO BOTTOM:	0.5
FLOW DIRECTION:	-
UPSTREAM/DOWNSTREAN:	Downstream from ANGB
LAT/LONG:	44.4805 / -73.1538

SAMPLE DESCRIPTION

COLOR:	grayish-brown
ODOR:	none
SUSPENDED MATTER:	very turbid
OTHER:	-

FIELD TESTS

TEMPERATURE:	15.4	REDOX:	-89.5
pH:	7.14	DISSOLVED O2:	1.5
CONDUCTIVITY:	0.372	TURBIDITY:	805

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

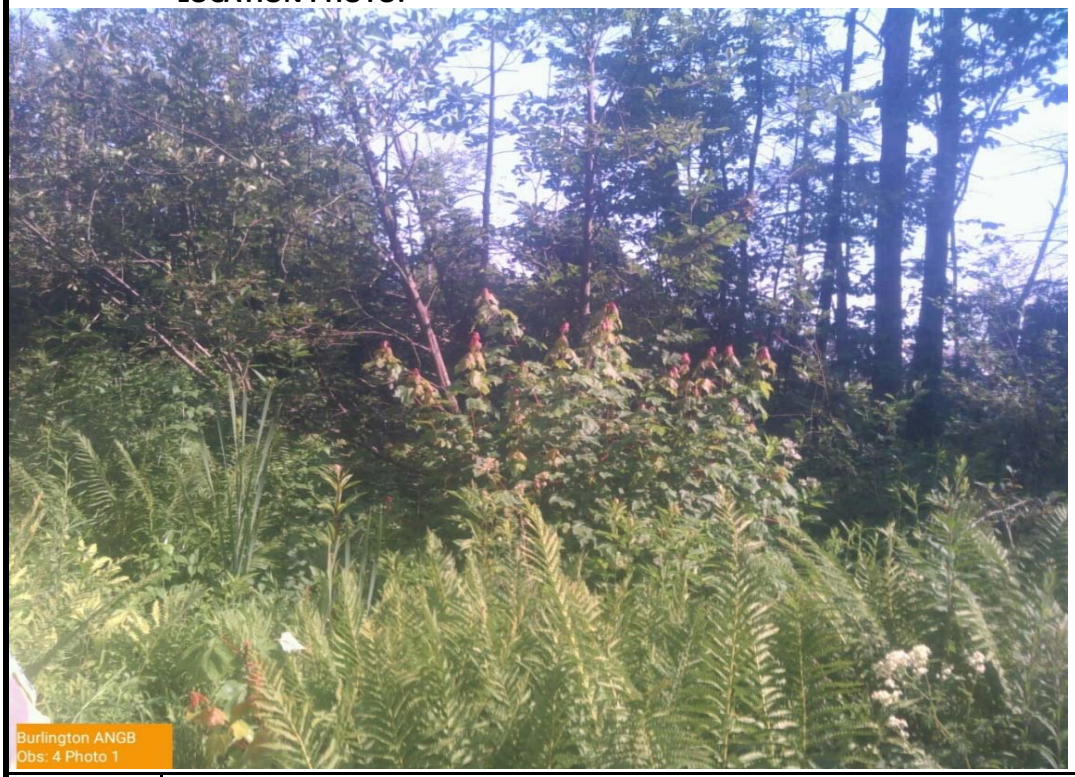
ANALYSIS:	PFAS (EPA 537 Modified)
QA/QC SAMPLE ID:	BRLTNDG-022-SW-0.0-0.25
DUPLICATE:	-
EB SAMPLE ID:	-
FB SAMPLE ID:	-
QA/QC ANALYSIS:	PFAS (EPA 537 Modified)
DATE/TIME REFRIGERATED:	-
CHAIN OF CUSTODY NUMBER:	-
SHIPPED VIA:	-
LABORATORY:	Test America

COMMENTS / MISCELLANEOUS

-

SURFACE WATER SAMPLING RECORD

LOCATION PHOTO:



Caption:	-

SURFACE WATER SAMPLING RECORD

SITE NAME:	Burlington
PROJECT NUMBER:	100042.0052.110100.30001
SAMPLING DATE/TIME:	7/8/2019 14:00:00 PM

WEATHER:

Temperature °F	Wind Speed mph	Wind Direction	Sky	Precipitation
-	-	-	-	-

SAMPLERS:	Kylah Wyatt, Jessica Click
SAMPLE ID:	BRLTNDG-023-SW
SAMPLING METHOD:	sample bottle

DESCRIPTION OF SAMPLING POINT

OBSERVATIONS:	Small, shallow stream
DEPTH TO BOTTOM:	0.5
FLOW DIRECTION:	S
UPSTREAM/DOWNSTREAN:	Downstream from ANGB
LAT/LONG:	44.4821 / -73.1511

SAMPLE DESCRIPTION

COLOR:	Clear
ODOR:	-
SUSPENDED MATTER:	none
OTHER:	-

FIELD TESTS

TEMPERATURE:	20.4	REDOX:	9.4
pH:	7.4	DISSOLVED O2:	0.96
CONDUCTIVITY:	0.329	TURBIDITY:	15.4

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

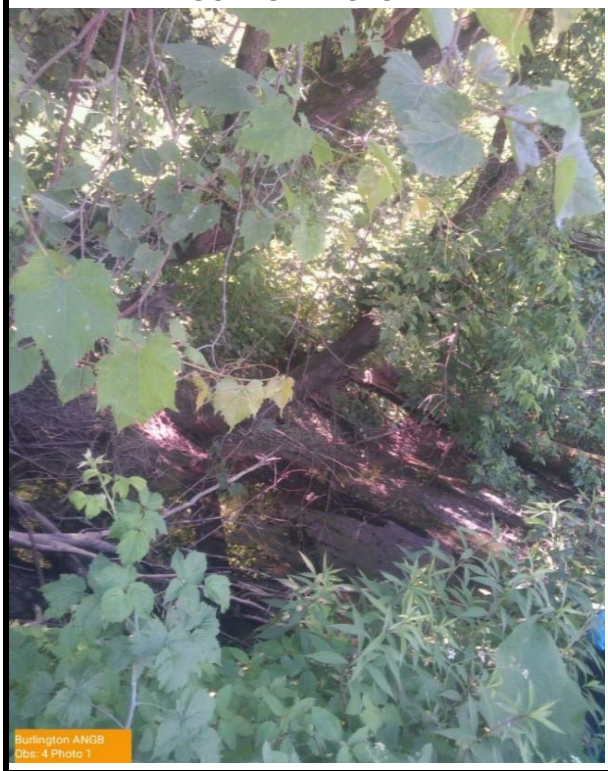
ANALYSIS:	PFAS (EPA 537 Modified)
QA/QC SAMPLE ID:	BRLTNDG-023-SW-0.0-0.5
DUPLICATE:	-
EB SAMPLE ID:	-
FB SAMPLE ID:	-
QA/QC ANALYSIS:	PFAS (EPA 537 Modified)
DATE/TIME REFRIGERATED:	-
CHAIN OF CUSTODY NUMBER:	-
SHIPPED VIA:	-
LABORATORY:	Test America

COMMENTS / MISCELLANEOUS

Sample collected 25 ft upgradient of culvert

SURFACE WATER SAMPLING RECORD

LOCATION PHOTO:



Caption:	-

SURFACE WATER SAMPLING RECORD

SITE NAME:	Burlington
PROJECT NUMBER:	100042.0052.110100.30001
SAMPLING DATE/TIME:	7/11/2019 13:00:00 PM

WEATHER:

Temperature °F	Wind Speed mph	Wind Direction	Sky	Precipitation
-	-	-	-	-

SAMPLERS:	Aaron Sutton, Kylah Wyatt
SAMPLE ID:	BRLTNUP-001-SW
SAMPLING METHOD:	sample bottle

DESCRIPTION OF SAMPLING POINT

OBSERVATIONS:	Stream just west of corn field
DEPTH TO BOTTOM:	2
FLOW DIRECTION:	N
UPSTREAM/DOWNSTREAN:	Upstream from ANGB
LAT/LONG:	44.4667 / -73.1374

SAMPLE DESCRIPTION

COLOR:	clear
ODOR:	none
SUSPENDED MATTER:	none
OTHER:	-

FIELD TESTS

TEMPERATURE:	23.3	REDOX:	163
pH:	8.59	DISSOLVED O2:	9.29
CONDUCTIVITY:	0.78	TURBIDITY:	6.86

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

ANALYSIS:	PFAS (EPA 537 Modified)
QA/QC SAMPLE ID:	BRLTNUP-001-SW-0.0-1.0
DUPLICATE:	-
EB SAMPLE ID:	-
FB SAMPLE ID:	-
QA/QC ANALYSIS:	PFAS (EPA 537 Modified)
DATE/TIME REFRIGERATED:	-
CHAIN OF CUSTODY NUMBER:	-
SHIPPED VIA:	-
LABORATORY:	Test America

COMMENTS / MISCELLANEOUS

-

SURFACE WATER SAMPLING RECORD

LOCATION PHOTO:



Caption:	-

SURFACE WATER SAMPLING RECORD

SITE NAME:	Burlington
PROJECT NUMBER:	100042.0052.110100.30001
SAMPLING DATE/TIME:	7/8/2019 14:40:00 PM

WEATHER:

Temperature °F	Wind Speed mph	Wind Direction	Sky	Precipitation
-	-	-	-	-

SAMPLERS:	Kylah Wyatt, Jessica Click
SAMPLE ID:	BRLTNUP-002-SW
SAMPLING METHOD:	sample bottle

DESCRIPTION OF SAMPLING POINT

OBSERVATIONS:	Stream under a bridge
DEPTH TO BOTTOM:	1.5
FLOW DIRECTION:	NW
UPSTREAM/DOWNSTREAN:	Upstream from ANGB
LAT/LONG:	44.4728 / -73.1349

SAMPLE DESCRIPTION

COLOR:	Clear
ODOR:	-
SUSPENDED MATTER:	none
OTHER:	-

FIELD TESTS

TEMPERATURE:	25.3	REDOX:	21.8
pH:	8.76	DISSOLVED O2:	13.52
CONDUCTIVITY:	0.68	TURBIDITY:	8.14

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

ANALYSIS:	PFAS (EPA 537 Modified)
QA/QC SAMPLE ID:	BRLTNUP-002-SW-0.0-1.0
DUPLICATE:	-
EB SAMPLE ID:	-
FB SAMPLE ID:	-
QA/QC ANALYSIS:	PFAS (EPA 537 Modified)
DATE/TIME REFRIGERATED:	-
CHAIN OF CUSTODY NUMBER:	-
SHIPPED VIA:	-
LABORATORY:	Test America

COMMENTS / MISCELLANEOUS

-

SURFACE WATER SAMPLING RECORD

LOCATION PHOTO:



Caption:	-

SURFACE WATER SAMPLING RECORD

SITE NAME:	Burlington
PROJECT NUMBER:	100042.0052.110100.30001
SAMPLING DATE/TIME:	7/8/2019 15:00:00 PM

WEATHER:

Temperature °F	Wind Speed mph	Wind Direction	Sky	Precipitation
-	-	-	-	-

SAMPLERS:	Kylah Wyatt, Jessica Click
SAMPLE ID:	BRLTNUP-003-SW
SAMPLING METHOD:	sample bottle

DESCRIPTION OF SAMPLING POINT

OBSERVATIONS:	Stream downgradient of bridge
DEPTH TO BOTTOM:	2
FLOW DIRECTION:	NW
UPSTREAM/DOWNSTREAN:	Upstream from ANGB
LAT/LONG:	44.4729 / -73.1334

SAMPLE DESCRIPTION

COLOR:	Clear
ODOR:	-
SUSPENDED MATTER:	none
OTHER:	-

FIELD TESTS

TEMPERATURE:	25.5	REDOX:	29.6
pH:	7.94	DISSOLVED O2:	12.58
CONDUCTIVITY:	0.79	TURBIDITY:	9.33

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

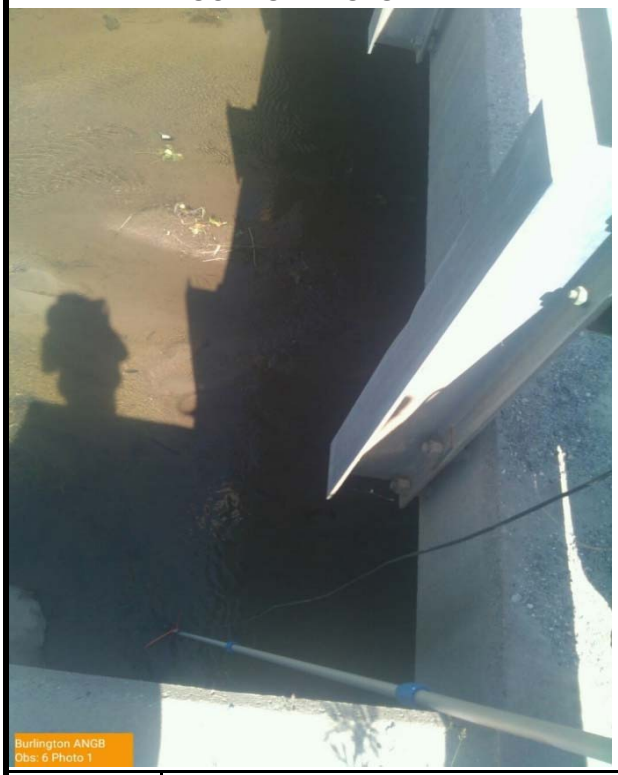
ANALYSIS:	PFAS (EPA 537 Modified)
QA/QC SAMPLE ID:	BRLTNUP-003-SW-0.0-1.0
DUPLICATE:	-
EB SAMPLE ID:	-
FB SAMPLE ID:	-
QA/QC ANALYSIS:	PFAS (EPA 537 Modified)
DATE/TIME REFRIGERATED:	-
CHAIN OF CUSTODY NUMBER:	-
SHIPPED VIA:	-
LABORATORY:	Test America

COMMENTS / MISCELLANEOUS

-

SURFACE WATER SAMPLING RECORD

LOCATION PHOTO:



Caption:	-

SURFACE WATER SAMPLING RECORD

SITE NAME:	Burlington
PROJECT NUMBER:	100042.0052.110100.30001
SAMPLING DATE/TIME:	7/11/2019 12:25

WEATHER:

Temperature °F	Wind Speed mph	Wind Direction	Sky	Precipitation
-	-	-	-	-

SAMPLERS:	Aaron Sutton, Kylah Wyatt
SAMPLE ID:	BRLTNUP-004-SW
SAMPLING METHOD:	sample bottle

DESCRIPTION OF SAMPLING POINT

OBSERVATIONS:	South bank of river
DEPTH TO BOTTOM:	3
FLOW DIRECTION:	W
UPSTREAM/DOWNSTREAN:	Upstream from ANGB
LAT/LONG:	44.4741 / -73.1335

SAMPLE DESCRIPTION

COLOR:	clear
ODOR:	none
SUSPENDED MATTER:	none
OTHER:	-

FIELD TESTS

TEMPERATURE:	22.9	REDOX:	105.6
pH:	7.77	DISSOLVED O2:	6.89
CONDUCTIVITY:	0.28	TURBIDITY:	7.61

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

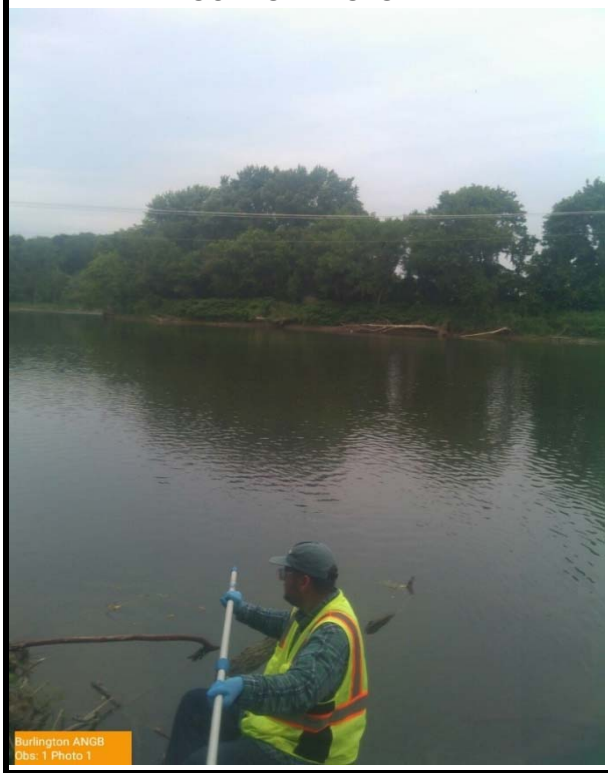
ANALYSIS:	PFAS (EPA 537 Modified)
QA/QC SAMPLE ID:	BRLTNUP-004-SW-0.0-1.5
DUPLICATE:	-
EB SAMPLE ID:	-
FB SAMPLE ID:	-
QA/QC ANALYSIS:	PFAS (EPA 537 Modified)
DATE/TIME REFRIGERATED:	-
CHAIN OF CUSTODY NUMBER:	-
SHIPPED VIA:	-
LABORATORY:	Test America

COMMENTS / MISCELLANEOUS

Sample collected from a small beach

SURFACE WATER SAMPLING RECORD

LOCATION PHOTO:



Caption:	-

SURFACE WATER SAMPLING RECORD

SITE NAME:	Burlington
PROJECT NUMBER:	100042.0052.110100.30001
SAMPLING DATE/TIME:	7/8/2019 15:20:00 PM

WEATHER:

Temperature °F	Wind Speed mph	Wind Direction	Sky	Precipitation
-	-	-	-	-

SAMPLERS:	Kylah Wyatt, Jessica Click
SAMPLE ID:	BRLTNUP-005-SW
SAMPLING METHOD:	sample bottle

DESCRIPTION OF SAMPLING POINT

OBSERVATIONS:	Bank of the river
DEPTH TO BOTTOM:	-
FLOW DIRECTION:	N
UPSTREAM/DOWNSTREAN:	Upstream from ANGB
LAT/LONG:	44.4751 / -73.1367

SAMPLE DESCRIPTION

COLOR:	Clear
ODOR:	-
SUSPENDED MATTER:	none
OTHER:	-

FIELD TESTS

TEMPERATURE:	25.2	REDOX:	25
pH:	8.36	DISSOLVED O2:	15.55
CONDUCTIVITY:	0.59	TURBIDITY:	7.7

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

ANALYSIS:	PFAS (EPA 537 Modified)
QA/QC SAMPLE ID:	BRLTNUP-005-SW-0.0-1.0
DUPLICATE:	-
EB SAMPLE ID:	-
FB SAMPLE ID:	-
QA/QC ANALYSIS:	PFAS (EPA 537 Modified)
DATE/TIME REFRIGERATED:	-
CHAIN OF CUSTODY NUMBER:	-
SHIPPED VIA:	-
LABORATORY:	Test America

COMMENTS / MISCELLANEOUS

-

SURFACE WATER SAMPLING RECORD

LOCATION PHOTO:



Caption:	-

APPENDIX I Sediment Sampling Logs

SEDIMENT SAMPLING RECORD

SITE NAME:	Burlington
PROJECT NUMBER:	100042.0052.110100.30001
SAMPLING DATE/TIME:	06/13/2019 12:59

WEATHER:

Temperature °F	Wind Speed mph	Wind Direction	Sky	Precipitation
68	4	E	Mostly Cloudy	None

SAMPLERS:	Kylah Wyatt
SAMPLE ID:	BRLTNDG-001-SD-0.0-0.2
SAMPLING METHOD:	disposable bowls and scoops/spoons
DEPTH OF SAMPLE:	0.3 ft.

DESCRIPTION OF SAMPLING POINT

OBSERVATIONS:	-
DEPTH OF WATER:	0
LAT/LONG:	44.4764634 / -73.1406588

SAMPLE DESCRIPTION

COLOR:	brown
ODOR:	none
TEXTURE:	Silt
MOISTURE:	wet

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

ANALYSIS:	PFAS (EPA 537 Modified)
SAMPLE ID:	BRLTNDG-001-SD-0.0-0.3
DUPlICATE:	-
EB SAMPLE ID:	-
FB SAMPLE ID:	-
QA/QC ANALYSIS:	PFAS (EPA 537 Modified)
DATE/TIME REFRIGERATED:	06/13/2019 13:15
CHAIN OF CUSTODY NUMBER:	-
SHIPPED VIA:	-
LABORATORY:	Test America

COMMENTS / MISCELLANEOUS

Sample collected by dipping container into sediment. No EB collected.
See corresponding Surface Water Sampling record for location photos.

SEDIMENT SAMPLING RECORD

SITE NAME:	Burlington
PROJECT NUMBER:	100042.0052.110100.30001
SAMPLING DATE/TIME:	06/10/2019 10:35

WEATHER:

Temperature °F	Wind Speed mph	Wind Direction	Sky	Precipitation
71	4	S	Partly Cloudy	None

SAMPLERS:	Aaron Sutton
SAMPLE ID:	BRLTNDG-002-SD-0.0-0.5
SAMPLING METHOD:	stainless steel bowls and scoops/spoons
DEPTH OF SAMPLE:	0.5 ft.

DESCRIPTION OF SAMPLING POINT

OBSERVATIONS:	Sediment deposition maximus
DEPTH OF WATER:	0.3
LAT/LONG:	44.4792654 / -73.1433092

SAMPLE DESCRIPTION

COLOR:	brown
ODOR:	none
TEXTURE:	Silt
MOISTURE:	wet

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

ANALYSIS:	PFAS (EPA 537 Modified)
SAMPLE ID:	BRLTNDG-002-SD-0.0-0.5
DUPlICATE:	-
EB SAMPLE ID:	-
FB SAMPLE ID:	-
QA/QC ANALYSIS:	PFAS (EPA 537 Modified)
DATE/TIME REFRIGERATED:	06/10/2019 10:41
CHAIN OF CUSTODY NUMBER:	-
SHIPPED VIA:	-
LABORATORY:	Test America

COMMENTS / MISCELLANEOUS

-

SEDIMENT SAMPLING RECORD

LOCATION PHOTO:



Caption:	-

SEDIMENT SAMPLING RECORD

SITE NAME:	Burlington
PROJECT NUMBER:	100042.0052.110100.30001
SAMPLING DATE/TIME:	06/13/2019 12:33

WEATHER:

Temperature °F	Wind Speed mph	Wind Direction	Sky	Precipitation
68	2	SE	Mostly Cloudy	None

SAMPLERS:	Kylah Wyatt
SAMPLE ID:	BRLTNDG-003-SD-0.0-0.1
SAMPLING METHOD:	disposable bowls and scoops/spoons
DEPTH OF SAMPLE:	0.3 ft.

DESCRIPTION OF SAMPLING POINT

OBSERVATIONS:	-
DEPTH OF WATER:	0
LAT/LONG:	44.4784387 / -73.1435102

SAMPLE DESCRIPTION

COLOR:	brown
ODOR:	none
TEXTURE:	Silt
MOISTURE:	wet

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

ANALYSIS:	PFAS (EPA 537 Modified)
SAMPLE ID:	BRLTNDG-003-SD-0.0-0.1
DUPlICATE:	-
EB SAMPLE ID:	-
FB SAMPLE ID:	-
QA/QC ANALYSIS:	PFAS (EPA 537 Modified)
DATE/TIME REFRIGERATED:	06/13/2019 13:20
CHAIN OF CUSTODY NUMBER:	-
SHIPPED VIA:	-
LABORATORY:	Test America

COMMENTS / MISCELLANEOUS

Sample collected by dipping container into sediment. No EB collected.
See corresponding Surface Water record for location photos.

SEDIMENT SAMPLING RECORD

SITE NAME:	Burlington
PROJECT NUMBER:	100042.0052.110100.30001
SAMPLING DATE/TIME:	6/13/2019 12:13

WEATHER:

Temperature °F	Wind Speed mph	Wind Direction	Sky	Precipitation
-	-	-	-	-

SAMPLERS:	Kylah Wyatt
SAMPLE ID:	BRLTNDG-004-SD
SAMPLING METHOD:	disposable bowls and sample bottle
DEPTH OF SAMPLE:	0.3 ft.

DESCRIPTION OF SAMPLING POINT

OBSERVATIONS:	Shallow, slow moving, turbid stream
DEPTH OF WATER:	0.1
LAT/LONG:	44.4786201 / -73.1442541

SAMPLE DESCRIPTION

COLOR:	gray
ODOR:	none
TEXTURE:	silt
MOISTURE:	wet

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

ANALYSIS:	PFAS
SAMPLE ID:	BRLTNDG-004-SD-0.0-0.3
DUPlICATE:	-
EB SAMPLE ID:	-
FB SAMPLE ID:	-
QA/QC ANALYSIS:	-
DATE/TIME REFRIGERATED:	-
CHAIN OF CUSTODY NUMBER:	-
SHIPPED VIA:	-
LABORATORY:	Test America

COMMENTS / MISCELLANEOUS

See corresponding Surface Water Sampling record for location photos.

SEDIMENT SAMPLING RECORD

SITE NAME:	Burlington
PROJECT NUMBER:	100042.0052.110100.30001
SAMPLING DATE/TIME:	06/13/2019 12:13

WEATHER:

Temperature °F	Wind Speed mph	Wind Direction	Sky	Precipitation
68	2	SE	Mostly Cloudy	None

SAMPLERS:	Kylah Wyatt
SAMPLE ID:	BRLTNDG-005-SD-0.0-0.3
SAMPLING METHOD:	disposable bowls and scoops/spoons
DEPTH OF SAMPLE:	0.3 ft.

DESCRIPTION OF SAMPLING POINT

OBSERVATIONS:	-
DEPTH OF WATER:	0
LAT/LONG:	44.4787698 / -73.1447933

SAMPLE DESCRIPTION

COLOR:	gray
ODOR:	none
TEXTURE:	Silt
MOISTURE:	wet

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

ANALYSIS:	PFAS (EPA 537 Modified)
SAMPLE ID:	BRLTNDG-005-SD-0.0-0.3
DUPlICATE:	-
EB SAMPLE ID:	-
FB SAMPLE ID:	-
QA/QC ANALYSIS:	PFAS (EPA 537 Modified)
DATE/TIME REFRIGERATED:	06/13/2019 13:20
CHAIN OF CUSTODY NUMBER:	-
SHIPPED VIA:	-
LABORATORY:	Test America

COMMENTS / MISCELLANEOUS

Container dipped in sediment for collection. No EB collected.
See corresponding Surface Water Sampling record for location photos.

SEDIMENT SAMPLING RECORD

SITE NAME:	Burlington
PROJECT NUMBER:	100042.0052.110100.30001
SAMPLING DATE/TIME:	6/13/2019 11:43

WEATHER:

Temperature °F	Wind Speed mph	Wind Direction	Sky	Precipitation
68	2	SE	Mostly Cloudy	None

SAMPLERS:	Kylah Wyatt
SAMPLE ID:	BRLTNDG-006-SD-0-0.5
SAMPLING METHOD:	disposable bowls and scoops/spoons
DEPTH OF SAMPLE:	0.2 ft.

DESCRIPTION OF SAMPLING POINT

OBSERVATIONS:	Lots of organics
DEPTH OF WATER:	0
LAT/LONG:	44.4785682/-73.1448465

SAMPLE DESCRIPTION

COLOR:	black
ODOR:	none
TEXTURE:	Silt
MOISTURE:	wet

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

ANALYSIS:	PFAS (EPA 537 Modified)
SAMPLE ID:	BRLTNDG-006-SD-0-0.5
DUPlICATE:	-
EB SAMPLE ID:	-
FB SAMPLE ID:	-
QA/QC ANALYSIS:	PFAS (EPA 537 Modified)
DATE/TIME REFRIGERATED:	6/13/2019 11:43
CHAIN OF CUSTODY NUMBER:	-
SHIPPED VIA:	-
LABORATORY:	Test America

COMMENTS / MISCELLANEOUS

Container dipped into sediment to collect sample. No EB collected.

SEDIMENT SAMPLING RECORD

SITE NAME:	Burlington
PROJECT NUMBER:	100042.0052.110100.30001
SAMPLING DATE/TIME:	06/13/2019 15:31

WEATHER:

Temperature °F	Wind Speed mph	Wind Direction	Sky	Precipitation
68	5	N	Partly Cloudy	None

SAMPLERS:	Kylah Wyatt, Aaron Sutton
SAMPLE ID:	BRLTNDG-007-SD
SAMPLING METHOD:	-
DEPTH OF SAMPLE:	- ft.

DESCRIPTION OF SAMPLING POINT

OBSERVATIONS:	Location could not be reached due to steep and overgrown
DEPTH OF WATER:	-
LAT/LONG:	-

SAMPLE DESCRIPTION

COLOR:	-
ODOR:	-
TEXTURE:	-
MOISTURE:	-

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

ANALYSIS:	-
SAMPLE ID:	-
DUPlICATE:	-
EB SAMPLE ID:	-
FB SAMPLE ID:	-
QA/QC ANALYSIS:	PFAS (EPA 537 Modified)
DATE/TIME REFRIGERATED:	06/14/2019 20:31
CHAIN OF CUSTODY NUMBER:	-
SHIPPED VIA:	-
LABORATORY:	-

COMMENTS / MISCELLANEOUS

Location could not be reached due to steep and overgrown ravine. Location dropped from sampling program.

SEDIMENT SAMPLING RECORD

SITE NAME:	Burlington
PROJECT NUMBER:	100042.0052.110100.30001
SAMPLING DATE/TIME:	6/13/2019 9:56

WEATHER:

Temperature °F	Wind Speed mph	Wind Direction	Sky	Precipitation
65	5	N	Overcast	None

SAMPLERS:	Aaron Sutton and Kylah Wyatt
SAMPLE ID:	BRLTNDG-008-SD-0-0.5
SAMPLING METHOD:	disposable bowls and scoops/spoons
DEPTH OF SAMPLE:	0.5 ft.

DESCRIPTION OF SAMPLING POINT

OBSERVATIONS:	Black fines. Silt and clay. Minor Organics
DEPTH OF WATER:	1
LAT/LONG:	44.4786421/-73.1488417

SAMPLE DESCRIPTION

COLOR:	black
ODOR:	organic
TEXTURE:	Clay
MOISTURE:	wet

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

ANALYSIS:	PFAS (EPA 537 Modified)
SAMPLE ID:	BRLTNDG-008-SD-0-0.5
DUPlICATE:	BRLTNDG-908-SD-0-0.5
EB SAMPLE ID:	-
FB SAMPLE ID:	-
QA/QC ANALYSIS:	PFAS (EPA 537 Modified)
DATE/TIME REFRIGERATED:	6/13/2019 9:56
CHAIN OF CUSTODY NUMBER:	-
SHIPPED VIA:	Drop off
LABORATORY:	Test America

COMMENTS / MISCELLANEOUS

All dedicated equipment used, no EB NEEDED

SEDIMENT SAMPLING RECORD



Caption:	-

SEDIMENT SAMPLING RECORD

SITE NAME:	Burlington
PROJECT NUMBER:	100042.0052.110100.30001
SAMPLING DATE/TIME:	6/13/2019 9:01

WEATHER:

Temperature °F	Wind Speed mph	Wind Direction	Sky	Precipitation
65	3	SE	Mostly Cloudy	None

SAMPLERS:	Kylah Wyatt
SAMPLE ID:	BRLTNDG-009-SD-0-0.1
SAMPLING METHOD:	disposable bowls and scoops/spoons
DEPTH OF SAMPLE:	0.3 ft.

DESCRIPTION OF SAMPLING POINT

OBSERVATIONS:	-
DEPTH OF WATER:	0
LAT/LONG:	44.4795187/-73.1569988

SAMPLE DESCRIPTION

COLOR:	gray-brown
ODOR:	none
TEXTURE:	Silty Clay
MOISTURE:	wet

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

ANALYSIS:	PFAS (EPA 537 Modified)
SAMPLE ID:	BRLTNDG-009-SD-0-0.1
DUPlICATE:	-
EB SAMPLE ID:	-
FB SAMPLE ID:	-
QA/QC ANALYSIS:	PFAS (EPA 537 Modified)
DATE/TIME REFRIGERATED:	6/13/2019 9:01
CHAIN OF CUSTODY NUMBER:	-
SHIPPED VIA:	-
LABORATORY:	Test America

COMMENTS / MISCELLANEOUS

This stream is from a seep. Collected sample by dipping container into sediment, no EB collected.

SEDIMENT SAMPLING RECORD



Caption:	-

SEDIMENT SAMPLING RECORD

SITE NAME:	Burlington
PROJECT NUMBER:	100042.0052.110100.30001
SAMPLING DATE/TIME:	6/13/2019 8:36

WEATHER:

Temperature °F	Wind Speed mph	Wind Direction	Sky	Precipitation
65	1	SE	Mostly Cloudy	None

SAMPLERS:	Kylah Wyatt
SAMPLE ID:	BRLTNDG-010-SD-0-0.3
SAMPLING METHOD:	disposable bowls and scoops/spoons
DEPTH OF SAMPLE:	0.3 ft.

DESCRIPTION OF SAMPLING POINT

OBSERVATIONS:	-
DEPTH OF WATER:	0.3
LAT/LONG:	44.4797304/-73.157636

SAMPLE DESCRIPTION

COLOR:	gray-brown
ODOR:	none
TEXTURE:	Silt
MOISTURE:	wet

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

ANALYSIS:	PFAS (EPA 537 Modified)
SAMPLE ID:	BRLTNDG-010-SD-0-0.3
DUPlICATE:	-
EB SAMPLE ID:	-
FB SAMPLE ID:	-
QA/QC ANALYSIS:	PFAS (EPA 537 Modified)
DATE/TIME REFRIGERATED:	6/13/2019 9:56
CHAIN OF CUSTODY NUMBER:	-
SHIPPED VIA:	-
LABORATORY:	Test America

COMMENTS / MISCELLANEOUS

MS/MSD collected here. Sample collected by dipping container into sediment.

SEDIMENT SAMPLING RECORD



Caption:	-

SEDIMENT SAMPLING RECORD

SITE NAME:	Burlington
PROJECT NUMBER:	100042.0052.110100.30001
SAMPLING DATE/TIME:	06/10/2019 14:49

WEATHER:

Temperature °F	Wind Speed mph	Wind Direction	Sky	Precipitation
68	8	NE	Partly Cloudy	None

SAMPLERS:	Dan Chamberland, Aaron Sutton
SAMPLE ID:	BRLTNDG-011-SD-0.0-0.5
SAMPLING METHOD:	stainless steel bowls and scoops/spoons
DEPTH OF SAMPLE:	0.5 ft.

DESCRIPTION OF SAMPLING POINT

OBSERVATIONS:	Nearly still, a swampy area that is part of the little ditch.
DEPTH OF WATER:	-
LAT/LONG:	44.480317 / -73.1575086

SAMPLE DESCRIPTION

COLOR:	clear
ODOR:	organic
TEXTURE:	Loam
MOISTURE:	wet

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

ANALYSIS:	PFAS (EPA 537 Modified)
SAMPLE ID:	BRLTNDG-011-SD-0.0-0.5
DUPlICATE:	-
EB SAMPLE ID:	BRLTN-0610191449-EB-SD
FB SAMPLE ID:	-
QA/QC ANALYSIS:	PFAS (EPA 537 Modified)
DATE/TIME REFRIGERATED:	06/10/2019 14:49
CHAIN OF CUSTODY NUMBER:	-
SHIPPED VIA:	-
LABORATORY:	Test America

COMMENTS / MISCELLANEOUS

Much leaf litter.

SEDIMENT SAMPLING RECORD

LOCATION PHOTO:



Caption:	-

SEDIMENT SAMPLING RECORD

SITE NAME:	Burlington
PROJECT NUMBER:	100042.0052.110100.30001
SAMPLING DATE/TIME:	06/10/2019 14:34

WEATHER:

Temperature °F	Wind Speed mph	Wind Direction	Sky	Precipitation
68	7	NE	Partly Cloudy	None

SAMPLERS:	Dan Chamberland, Aaron Sutton
SAMPLE ID:	BRLTNDG-012-SD-0.0-0.5
SAMPLING METHOD:	stainless steel bowls and scoops/spoons
DEPTH OF SAMPLE:	0.5 ft.

DESCRIPTION OF SAMPLING POINT

OBSERVATIONS:	Slow moving water.
DEPTH OF WATER:	-
LAT/LONG:	44.4804223 / -73.1588662

SAMPLE DESCRIPTION

COLOR:	black-brown
ODOR:	organic
TEXTURE:	Silt
MOISTURE:	wet

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

ANALYSIS:	PFAS (EPA 537 Modified)
SAMPLE ID:	BRLTNDG-012-SD-0.0-0.5
DUPlICATE:	-
EB SAMPLE ID:	-
FB SAMPLE ID:	-
QA/QC ANALYSIS:	PFAS (EPA 537 Modified)
DATE/TIME REFRIGERATED:	06/10/2019 14:50
CHAIN OF CUSTODY NUMBER:	-
SHIPPED VIA:	-
LABORATORY:	Test America

COMMENTS / MISCELLANEOUS

Very slight odor.

SEDIMENT SAMPLING RECORD

LOCATION PHOTO:



Caption:	-

SEDIMENT SAMPLING RECORD

SITE NAME:	Burlington
PROJECT NUMBER:	100042.0052.110100.30001
SAMPLING DATE/TIME:	6/13/2019 8:49

WEATHER:

Temperature °F	Wind Speed mph	Wind Direction	Sky	Precipitation
65	1	SE	Mostly Cloudy	None

SAMPLERS:	Kylah Wyatt
SAMPLE ID:	BRLTNDG-013-SD-0-0.3
SAMPLING METHOD:	disposable bowls and scoops/spoons
DEPTH OF SAMPLE:	0.5 ft.

DESCRIPTION OF SAMPLING POINT

OBSERVATIONS:	Silt and gravel sediment composition.
DEPTH OF WATER:	0
LAT/LONG:	44.479609/-73.1573326

SAMPLE DESCRIPTION

COLOR:	gray-brown
ODOR:	none
TEXTURE:	Silt
MOISTURE:	wet

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

ANALYSIS:	PFAS (EPA 537 Modified)
SAMPLE ID:	BRLTNDG-013-SD-0-0.3
DUPlICATE:	-
EB SAMPLE ID:	-
FB SAMPLE ID:	-
QA/QC ANALYSIS:	PFAS (EPA 537 Modified)
DATE/TIME REFRIGERATED:	6/13/2019 8:49
CHAIN OF CUSTODY NUMBER:	-
SHIPPED VIA:	-
LABORATORY:	Test America

COMMENTS / MISCELLANEOUS

Sample collected by dipping container into sediment. No EB collected.

SEDIMENT SAMPLING RECORD



Caption:	-

SEDIMENT SAMPLING RECORD

SITE NAME:	Burlington
PROJECT NUMBER:	100042.0052.110100.30001
SAMPLING DATE/TIME:	06/10/2019 11:47

WEATHER:

Temperature °F	Wind Speed mph	Wind Direction	Sky	Precipitation
70	5	W	Partly Cloudy	None

SAMPLERS:	Dan Chamberland, Aaron Sutton
SAMPLE ID:	BRLTNDG-014-SD-0.0-0.5
SAMPLING METHOD:	stainless steel bowls and scoops/spoons
DEPTH OF SAMPLE:	0.5 ft.

DESCRIPTION OF SAMPLING POINT

OBSERVATIONS:	Fast moving water
DEPTH OF WATER:	-
LAT/LONG:	44.4776139 / -73.1405614

SAMPLE DESCRIPTION

COLOR:	clear
ODOR:	none
TEXTURE:	Loamy Sand
MOISTURE:	wet

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

ANALYSIS:	PFAS (EPA 537 Modified)
SAMPLE ID:	BRLTNDG-014-SD-0.0-0.5
DUPlICATE:	BRLTNDG-914-SD-0.0-0.5
EB SAMPLE ID:	-
FB SAMPLE ID:	-
QA/QC ANALYSIS:	PFAS (EPA 537 Modified)
DATE/TIME REFRIGERATED:	06/10/2019 12:16
CHAIN OF CUSTODY NUMBER:	-
SHIPPED VIA:	-
LABORATORY:	Test America

COMMENTS / MISCELLANEOUS

Bubbles in the drainage flow upstream of the sample location.

SEDIMENT SAMPLING RECORD

SAMPLE PHOTO:



Caption:	-

LOCATION PHOTO:



Caption:	-

APPENDIX J Stormwater Sampling Logs

SURFACE WATER SAMPLING RECORD

SITE NAME:	Burlington
PROJECT NUMBER:	100042.0052.110100.30001
SAMPLING DATE/TIME:	06/11/2019 11:29

WEATHER:

Temperature °F	Wind Speed mph	Wind Direction	Sky	Precipitation
70	4	NE	Overcast	None

SAMPLERS:	Aaron Sutton
SAMPLE ID:	BRLTNDG-001-ST-0.0-0.0
SAMPLING METHOD:	sample bottle

DESCRIPTION OF SAMPLING POINT

OBSERVATIONS:	Slow flow, but steady
DEPTH TO BOTTOM:	0
FLOW DIRECTION:	NE
UPSTREAM/DOWNSTREAN:	Downstream from ANGB
LAT/LONG:	44.475979 / -73.1445457

SAMPLE DESCRIPTION

COLOR:	olive-brown
ODOR:	none
SUSPENDED MATTER:	Turbid
OTHER:	-

FIELD TESTS

TEMPERATURE:	17.3	REDOX:	172.1
pH:	8.09	DISSOLVED O2:	6.91
CONDUCTIVITY:	0.089	TURBIDITY:	40.7

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

ANALYSIS:	PFAS (EPA 537 Modified)
QA/QC SAMPLE ID:	BRLTNDG-001-ST-0.0-0.0
DUPLICATE:	-
EB SAMPLE ID:	-
FB SAMPLE ID:	-
QA/QC ANALYSIS:	PFAS (EPA 537 Modified)
DATE/TIME REFRIGERATED:	06/11/2019 11:50
CHAIN OF CUSTODY NUMBER:	-
SHIPPED VIA:	-
LABORATORY:	Test America

COMMENTS / MISCELLANEOUS

-

SURFACE WATER SAMPLING RECORD

LOCATION PHOTO:



Caption:	-

SURFACE WATER SAMPLING RECORD

SITE NAME:	BRLTNDG-003-ST
PROJECT NUMBER:	100042.0052.110100.30001
SAMPLING DATE/TIME:	07/17/2019 08:22

WEATHER:

Temperature °F	Wind Speed mph	Wind Direction	Sky	Precipitation
80	1	N	Overcast	Rain

SAMPLERS:	Aaron Sutton, Jessica click
SAMPLE ID:	BRLTNDG-003-ST-0.0-2.0
SAMPLING METHOD:	sample bottle

DESCRIPTION OF SAMPLING POINT

OBSERVATIONS:	Storm drain. Fast flowing.
DEPTH TO BOTTOM:	-
FLOW DIRECTION:	NE
UPSTREAM/DOWNSTREAN:	Downstream from ANGB
LAT/LONG:	44.4760408 / -73.1438498

SAMPLE DESCRIPTION

COLOR:	gray-brown
ODOR:	none
SUSPENDED MATTER:	Not Turbid
OTHER:	-

FIELD TESTS

TEMPERATURE:	22.3	REDOX:	159.5
pH:	7.39	DISSOLVED O2:	6.43
CONDUCTIVITY:	0.072	TURBIDITY:	58.3

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

ANALYSIS:	PFAS (EPA 537 Modified)
QA/QC SAMPLE ID:	BRLTNDG-003-ST-0.0-2.0
DUPLICATE:	-
EB SAMPLE ID:	-
FB SAMPLE ID:	-
QA/QC ANALYSIS:	PFAS (EPA 537 Modified)
DATE/TIME REFRIGERATED:	07/17/2019 08:21
CHAIN OF CUSTODY NUMBER:	-
SHIPPED VIA:	-
LABORATORY:	Test America

COMMENTS / MISCELLANEOUS

-

SURFACE WATER SAMPLING RECORD

LOCATION PHOTO:



Caption:	BRLTN-003-ST

SURFACE WATER SAMPLING RECORD

SITE NAME:	BRLTNDG-004-ST
PROJECT NUMBER:	100042.0052.110100.30001
SAMPLING DATE/TIME:	07/17/2019 08:43

WEATHER:

Temperature °F	Wind Speed mph	Wind Direction	Sky	Precipitation
80	1	N	Mostly Cloudy	Rain

SAMPLERS:	Aaron Sutton, Jessica click
SAMPLE ID:	BRLTNDG-004-ST
SAMPLING METHOD:	sample bottle

DESCRIPTION OF SAMPLING POINT

OBSERVATIONS:	-
DEPTH TO BOTTOM:	
FLOW DIRECTION:	NE
UPSTREAM/DOWNSTREAN:	Downstream from ANGB
LAT/LONG:	44.4768432 / -73.1445431

SAMPLE DESCRIPTION

COLOR:	clear
ODOR:	none
SUSPENDED MATTER:	Not Turbid
OTHER:	Foaming

FIELD TESTS

TEMPERATURE:	23.5	REDOX:	181.4
pH:	7.51	DISSOLVED O2:	5.67
CONDUCTIVITY:	0.131	TURBIDITY:	10.7

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

ANALYSIS:	PFAS (EPA 537 Modified)
QA/QC SAMPLE ID:	BRLTNDG-004-ST
DUPLICATE:	-
EB SAMPLE ID:	-
FB SAMPLE ID:	-
QA/QC ANALYSIS:	PFAS (EPA 537 Modified)
DATE/TIME REFRIGERATED:	07/17/2019 08:42
CHAIN OF CUSTODY NUMBER:	-
SHIPPED VIA:	-
LABORATORY:	Test America

COMMENTS / MISCELLANEOUS

-

SURFACE WATER SAMPLING RECORD

SAMPLE PHOTO:



Caption:	004-ST

SURFACE WATER SAMPLING RECORD

SITE NAME:	BRLTNDG-006-ST
PROJECT NUMBER:	100042.0052.110100.30001
SAMPLING DATE/TIME:	07/17/2019 09:21

WEATHER:

Temperature °F	Wind Speed mph	Wind Direction	Sky	Precipitation
75	1	N	Mostly Cloudy	Rain

SAMPLERS:	Aaron Sutton, Jessica click
SAMPLE ID:	BRLTNDG-006-ST
SAMPLING METHOD:	sample bottle

DESCRIPTION OF SAMPLING POINT

OBSERVATIONS:	Storm drain. Moderate to low flow.
DEPTH TO BOTTOM:	-
FLOW DIRECTION:	N
UPSTREAM/DOWNSTREAN:	Downstream from ANGB
LAT/LONG:	44.4776113 / -73.1446488

SAMPLE DESCRIPTION

COLOR:	clear
ODOR:	none
SUSPENDED MATTER:	Not Turbid
OTHER:	-

FIELD TESTS

TEMPERATURE:	21.4	REDOX:	191.9
pH:	7.56	DISSOLVED O2:	6.27
CONDUCTIVITY:	0.084	TURBIDITY:	82.1

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

ANALYSIS:	PFAS (EPA 537 Modified)
QA/QC SAMPLE ID:	BRLTNDG-006-ST
DUPLICATE:	-
EB SAMPLE ID:	-
FB SAMPLE ID:	-
QA/QC ANALYSIS:	PFAS (EPA 537 Modified)
DATE/TIME REFRIGERATED:	07/17/2019 09:22
CHAIN OF CUSTODY NUMBER:	-
SHIPPED VIA:	-
LABORATORY:	Test America

COMMENTS / MISCELLANEOUS

-

SURFACE WATER SAMPLING RECORD

LOCATION PHOTO:



Caption:	-

SURFACE WATER SAMPLING RECORD

SITE NAME:	Burlington
PROJECT NUMBER:	100042.0052.110100.30001
SAMPLING DATE/TIME:	06/11/2019 09:17

WEATHER:

Temperature °F	Wind Speed mph	Wind Direction	Sky	Precipitation
71	6	NE	Overcast	None

SAMPLERS:	Aaron Sutton
SAMPLE ID:	BRLTNDG-007-ST-0.0-0.0
SAMPLING METHOD:	sample bottle

DESCRIPTION OF SAMPLING POINT

OBSERVATIONS:	-
DEPTH TO BOTTOM:	0
FLOW DIRECTION:	NE
UPSTREAM/DOWNSTREAN:	Downstream from ANGB
LAT/LONG:	44.4776772 / -73.1449024

SAMPLE DESCRIPTION

COLOR:	clear
ODOR:	none
SUSPENDED MATTER:	Not Turbid
OTHER:	-

FIELD TESTS

TEMPERATURE:	16	REDOX:	220.1
pH:	7.17	DISSOLVED O2:	6.76
CONDUCTIVITY:	0.074	TURBIDITY:	34.2

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

ANALYSIS:	PFAS (EPA 537 Modified)
QA/QC SAMPLE ID:	BRLTNDG-007-ST-0.0-0.0
DUPLICATE:	-
EB SAMPLE ID:	-
FB SAMPLE ID:	-
QA/QC ANALYSIS:	PFAS (EPA 537 Modified)
DATE/TIME REFRIGERATED:	06/11/2019 09:25
CHAIN OF CUSTODY NUMBER:	-
SHIPPED VIA:	-
LABORATORY:	Test America

COMMENTS / MISCELLANEOUS

MS/MSD taken here

SURFACE WATER SAMPLING RECORD

SITE NAME:	Burlington
PROJECT NUMBER:	100042.0052.110100.30001
SAMPLING DATE/TIME:	06/11/2019 08:53

WEATHER:

Temperature °F	Wind Speed mph	Wind Direction	Sky	Precipitation
72	1	S	Overcast	Rain

SAMPLERS:	Aaron Sutton
SAMPLE ID:	BRLTNDG-011-ST-0.0-0.0
SAMPLING METHOD:	sample bottle

DESCRIPTION OF SAMPLING POINT

OBSERVATIONS:	-
DEPTH TO BOTTOM:	0
FLOW DIRECTION:	N
UPSTREAM/DOWNSTREAN:	Downstream from ANGB
LAT/LONG:	44.4770582 / -73.1495978

SAMPLE DESCRIPTION

COLOR:	clear
ODOR:	none
SUSPENDED MATTER:	Not Turbid
OTHER:	-

FIELD TESTS

TEMPERATURE:	16.9	REDOX:	271.6
pH:	6.46	DISSOLVED O2:	7.41
CONDUCTIVITY:	0.063	TURBIDITY:	1.2

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

ANALYSIS:	PFAS (EPA 537 Modified)
QA/QC SAMPLE ID:	BRLTNDG-011-ST-0.0-0.0
DUPLICATE:	BRLTNDG-911-ST-0.0-0.0
EB SAMPLE ID:	-
FB SAMPLE ID:	-
QA/QC ANALYSIS:	PFAS (EPA 537 Modified)
DATE/TIME REFRIGERATED:	06/11/2019 09:00
CHAIN OF CUSTODY NUMBER:	-
SHIPPED VIA:	-
LABORATORY:	Test America

COMMENTS / MISCELLANEOUS

-

SURFACE WATER SAMPLING RECORD

LOCATION PHOTO:



Caption:	-

SURFACE WATER SAMPLING RECORD

SITE NAME:	Burlington
PROJECT NUMBER:	100042.0052.110100.30001
SAMPLING DATE/TIME:	06/11/2019 08:31

WEATHER:

Temperature °F	Wind Speed mph	Wind Direction	Sky	Precipitation
70	4	S	Mostly Cloudy	Rain

SAMPLERS:	Aaron Sutton
SAMPLE ID:	BRLTNDG-012-ST-0.0-0.0
SAMPLING METHOD:	sample bottle

DESCRIPTION OF SAMPLING POINT

OBSERVATIONS:	-
DEPTH TO BOTTOM:	0
FLOW DIRECTION:	N
UPSTREAM/DOWNSTREAN:	Downstream from ANGB
LAT/LONG:	44.4766481 / -73.1503878

SAMPLE DESCRIPTION

COLOR:	clear
ODOR:	none
SUSPENDED MATTER:	Not Turbid
OTHER:	-

FIELD TESTS

TEMPERATURE:	19.1	REDOX:	213.5
pH:	7.06	DISSOLVED O2:	6.75
CONDUCTIVITY:	0.077	TURBIDITY:	26.5

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

ANALYSIS:	PFAS (EPA 537 Modified)
QA/QC SAMPLE ID:	BRLTNDG-012-ST-0.0-0.0
DUPLICATE:	-
EB SAMPLE ID:	-
FB SAMPLE ID:	-
QA/QC ANALYSIS:	PFAS (EPA 537 Modified)
DATE/TIME REFRIGERATED:	06/11/2019 08:45
CHAIN OF CUSTODY NUMBER:	-
SHIPPED VIA:	-
LABORATORY:	Test America

COMMENTS / MISCELLANEOUS

-

SURFACE WATER SAMPLING RECORD

LOCATION PHOTO:



Caption:	-

SURFACE WATER SAMPLING RECORD

SITE NAME:	Burlington
PROJECT NUMBER:	100042.0052.110100.30001
SAMPLING DATE/TIME:	06/11/2019 10:18

WEATHER:

Temperature °F	Wind Speed mph	Wind Direction	Sky	Precipitation
72	0	N	Overcast	None

SAMPLERS:	Dan Chamberland, Aaron Sutton
SAMPLE ID:	BRLTNDG-014-ST-0.0-0.0
SAMPLING METHOD:	sample bottle

DESCRIPTION OF SAMPLING POINT

OBSERVATIONS:	Bubbles on water surface
DEPTH TO BOTTOM:	0
FLOW DIRECTION:	N
UPSTREAM/DOWNSTREAN:	Downstream from ANGB
LAT/LONG:	44.4796189 / -73.1573406

SAMPLE DESCRIPTION

COLOR:	gray-brown
ODOR:	Very slight odor. Cannot define for sure
SUSPENDED MATTER:	Turbid
OTHER:	-

FIELD TESTS

TEMPERATURE:	12.8	REDOX:	201
pH:	7.77	DISSOLVED O2:	10.81
CONDUCTIVITY:	0.262	TURBIDITY:	86.7

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

ANALYSIS:	PFAS (EPA 537 Modified)
QA/QC SAMPLE ID:	BRLTNDG-014-ST-0.0-0.0
DUPLICATE:	BRLTNDG-914-ST-0.0-0.0
EB SAMPLE ID:	-
FB SAMPLE ID:	-
QA/QC ANALYSIS:	PFAS (EPA 537 Modified)
DATE/TIME REFRIGERATED:	06/11/2019 10:35
CHAIN OF CUSTODY NUMBER:	-
SHIPPED VIA:	-
LABORATORY:	Test America

COMMENTS / MISCELLANEOUS

-

SURFACE WATER SAMPLING RECORD

LOCATION PHOTO:



Caption:	-

SURFACE WATER SAMPLING RECORD

SITE NAME:	Burlington
PROJECT NUMBER:	100042.0052.110100.30001
SAMPLING DATE/TIME:	06/11/2019 09:55

WEATHER:

Temperature °F	Wind Speed mph	Wind Direction	Sky	Precipitation
71	0	NE	Overcast	None

SAMPLERS:	Aaron Sutton
SAMPLE ID:	BRLTNDG-016-ST-0.0-0.0
SAMPLING METHOD:	sample bottle

DESCRIPTION OF SAMPLING POINT

OBSERVATIONS:	-
DEPTH TO BOTTOM:	0
FLOW DIRECTION:	N
UPSTREAM/DOWNSTREAN:	Downstream from ANGB
LAT/LONG:	44.4812053 / -73.1603402

SAMPLE DESCRIPTION

COLOR:	clear
ODOR:	none
SUSPENDED MATTER:	Not Turbid
OTHER:	-

FIELD TESTS

TEMPERATURE:	15.6	REDOX:	216.5
pH:	7.37	DISSOLVED O2:	7.03
CONDUCTIVITY:	0.219	TURBIDITY:	4.8

SAMPLE ANALYSIS / QA/QC / CHAIN OF CUSTODY

ANALYSIS:	PFAS (EPA 537 Modified)
QA/QC SAMPLE ID:	BRLTNDG-016-ST-0.0-0.0
DUPLICATE:	-
EB SAMPLE ID:	-
FB SAMPLE ID:	-
QA/QC ANALYSIS:	PFAS (EPA 537 Modified)
DATE/TIME REFRIGERATED:	06/11/2019 10:30
CHAIN OF CUSTODY NUMBER:	-
SHIPPED VIA:	-
LABORATORY:	Test America

COMMENTS / MISCELLANEOUS

-

SURFACE WATER SAMPLING RECORD

LOCATION PHOTO:



Caption:	-

APPENDIX K Storm Sewer Line Inspection Documentation

Inspection Report

Dated: 7/5/2019

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Report details

Address:	599 Water Street Gardiner
Tel: (207)-582-4795	Fax: (207)-248-7193
Email:	
Survey Crew:	

Client Details

Client Name:	VT Underground Locating
Client Ref:	
Address:	494 Blair Park rd Williston
Telephone:	(802)-863-7113
Email:	

Site Details

Site Contact:	Tyler
Site Address:	106 NCO Dr
Town	South Burlington
ZIP/PostCode	05403
Telephone:	(802)-578-0207
Email:	

Survey details

Survey Date:	7/2/2019
Our Reference:	
Use:	Surface water
Purpose:	Invest. of infiltration problems
Weather:	No rain or snow
Pipe Height/Diameter:	
Pipe Width:	
Pipe Size:	Medium
Pipe Shape:	Circular
Pipe Material:	Steel
Direction:	Downstream

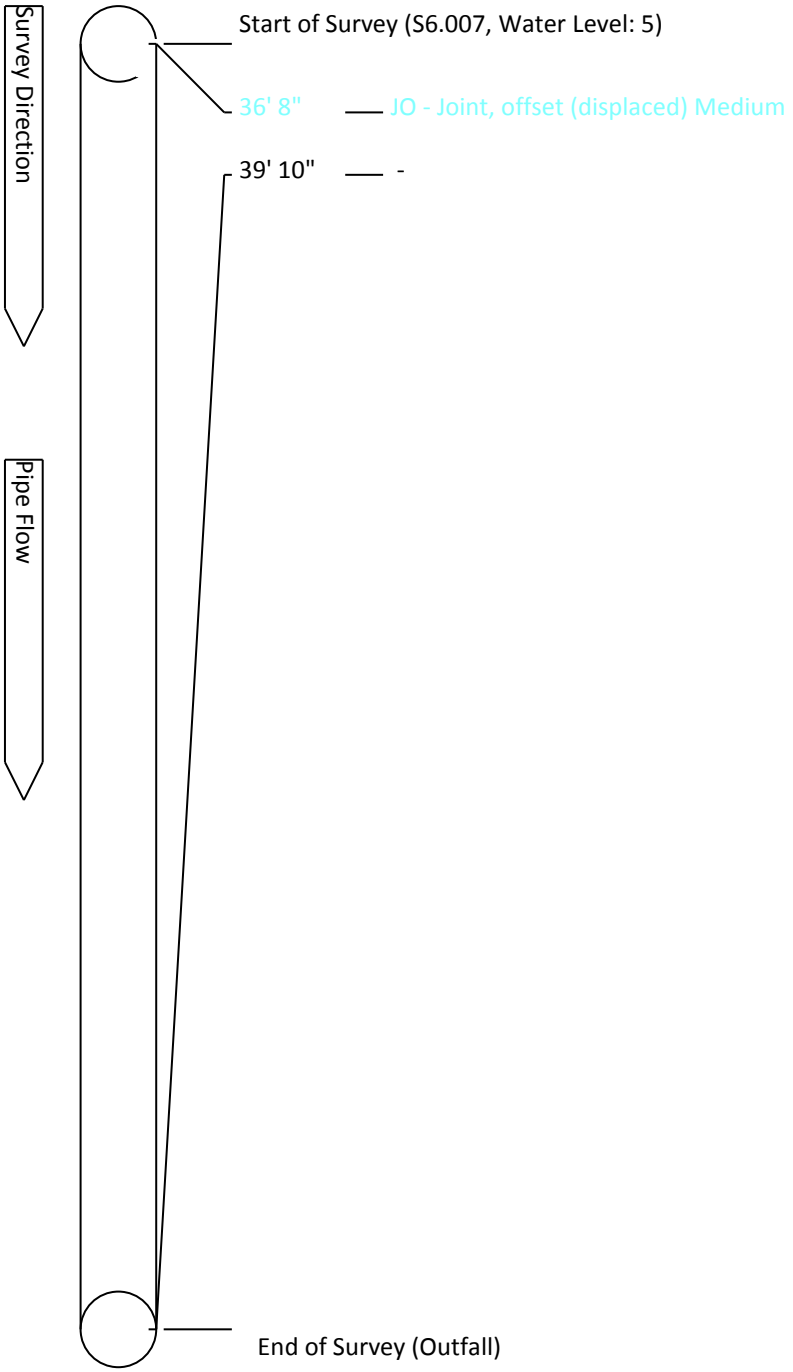
Observations

Crew:					
Survey Customer:	VT Underground Locating				
Job Ref:		**Survey Date:**	7/2/2019		
Survey Address:	106 NCO Dr				
Start:	S6.007	**Finish:**	Outfall		
Depth at Start Node:		**Depth at Finish Node:**			
Direction:	Downstream	**Height:**			
Length Surveyed:					
Material:	Steel	**Size**:	Medium	**Shape:**	Circular

Position	Code	Description/Remarks	Grade	Photo
36’ 8”	JO	Joint, offset (displaced) Medium.	3	 02Jul_002.JPG
39’ 10”		. end survey		 02Jul_003.JPG

Pipe Graphic

Crew:					
Survey Customer:	VT Underground Locating				
Job Ref:		**Survey Date:**	7/2/2019		
Survey Address:	106 NCO Dr				
Start:	S6.007	**Finish:**	Outfall		
Depth at Start Node:		**Depth at Finish Node:**			
Direction:	Downstream	**Height:**			
Length Surveyed:					
Material:	Steel	**Size**:	Medium	**Shape:**	Circular



Observation Table

Crew:					
Survey Customer:	VT Underground Locating				
Job Ref:		**Survey Date:**	7/2/2019		
Survey Address:	106 NCO Dr				
Start:	S6.007	**Finish:**	Outfall		
Depth at Start Node:		**Depth at Finish Node:**			
Direction:	Downstream	**Height:**			
Length Surveyed:					
Material:	Steel	**Size**:	Medium	**Shape:**	Circular

Code and Description			Grade	Cont. Defect	VALUE				Clock	
						mm		%	At/From	To
Position	**Code**	**Description**			**SML**	1st	2nd			
36’ 8”	JO	Joint, offset (displaced) ...	3		M					
39’ 10”										

Comments

Survey details

Survey Date:	7/2/2019
Our Reference:	
Use:	Surface water
Purpose:	Invest. of infiltration problems
Weather:	No rain or snow
Pipe Height/Diameter:	
Pipe Width:	
Pipe Size:	Medium
Pipe Shape:	Circular
Pipe Material:	Steel
Direction:	Downstream

Observations

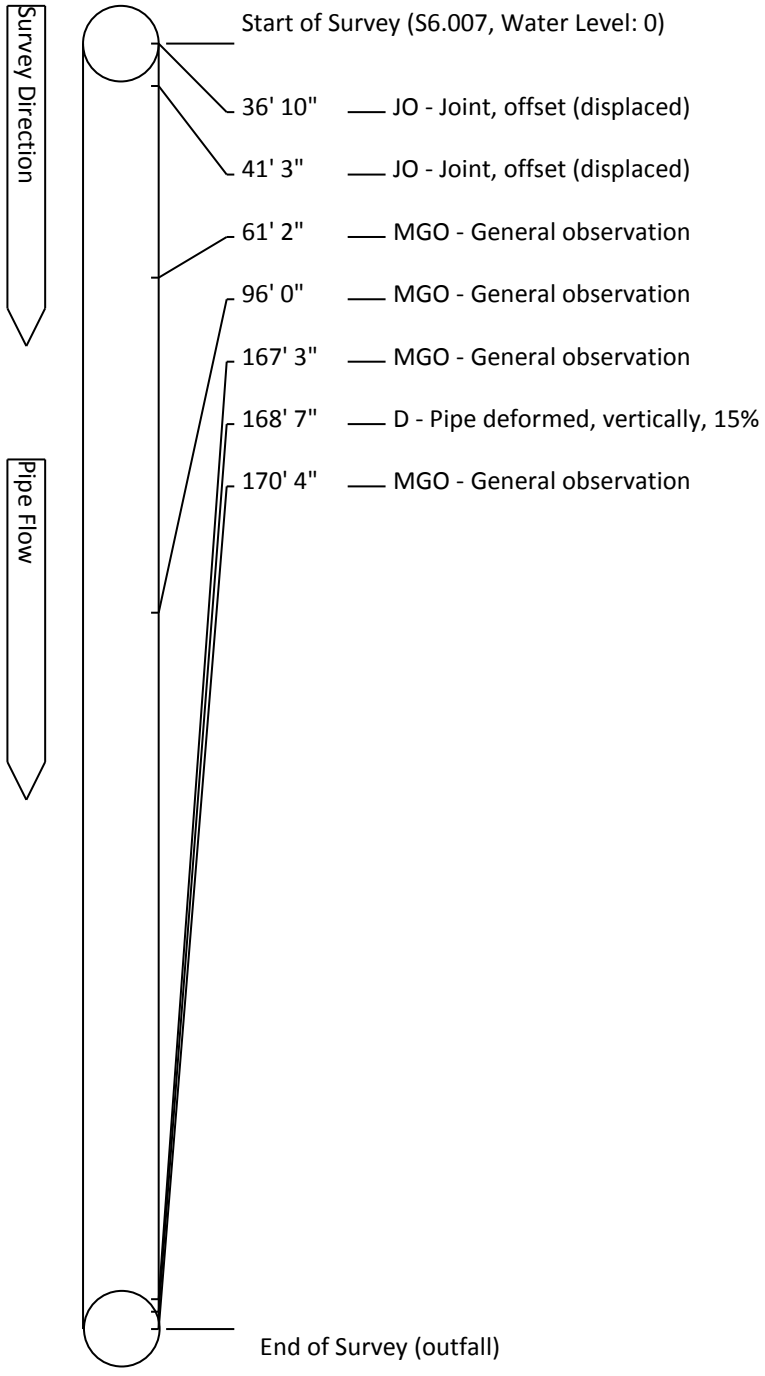
Crew:					
Survey Customer:	VT Underground Locating				
Job Ref:		**Survey Date:**	7/2/2019		
Survey Address:	106 NCO Dr				
Start:	S6.007	**Finish:**	Outfall		
Depth at Start Node:		**Depth at Finish Node:**			
Direction:	Downstream	**Height:**			
Length Surveyed:					
Material:	Steel	**Size**:	Medium	**Shape:**	Circular

Position	Code	Description/Remarks	Grade	Photo
36’ 10”	JO	Joint, offset (displaced) .		 02Jul_002.JPG
41’ 3”	JO	Joint, offset (displaced) .		 02Jul_003.JPG
61’ 2”	MGO	General observation. small puddle of water		 02Jul_004.JPG
96’ 0”	MGO	General observation. small puddle of water		 02Jul_005.JPG
167’ 3”	MGO	General observation. standing water		 02Jul_006.JPG

168’ 7”	D	Pipe deformed, vertically, 15%.	 02Jul_007.JPG
170’ 4”	MGO	General observation. survey abandon	 02Jul_008.JPG

Pipe Graphic

Crew:					
Survey Customer:	VT Underground Locating				
Job Ref:		**Survey Date:**	7/2/2019		
Survey Address:	106 NCO Dr				
Start:	S6.007	**Finish:**	Outfall		
Depth at Start Node:		**Depth at Finish Node:**			
Direction:	Downstream	**Height:**			
Length Surveyed:					
Material:	Steel	**Size**:	Medium	**Shape:**	Circular



Observation Table

Crew:					
Survey Customer:	VT Underground Locating				
Job Ref:		**Survey Date:**	7/2/2019		
Survey Address:	106 NCO Dr				
Start:	S6.007	**Finish:**	Outfall		
Depth at Start Node:		**Depth at Finish Node:**			
Direction:	Downstream	**Height:**			
Length Surveyed:					
Material:	Steel	**Size**:	Medium	**Shape:**	Circular

Code and Description			Grade	Cont. Defect	VALUE				Clock	
						mm		%	At/From	To
Position	**Code**	**Description**			**SML**	1st	2nd			
36’ 10”	JO	Joint, offset (displaced) ...								
41’ 3”	JO	Joint, offset (displaced) ...								
61’ 2”	MGO	General observation								
96’ 0”	MGO	General observation								
167’ 3”	MGO	General observation								
168’ 7”	D	Pipe deformed, vertically, ...%						15		
170’ 4”	MGO	General observation								

Comments

Survey details

Survey Date:	7/2/2019
Our Reference:	
Use:	Surface water
Purpose:	Invest. of infiltration problems
Weather:	No rain or snow
Pipe Height/Diameter:	
Pipe Width:	
Pipe Size:	Medium
Pipe Shape:	Circular
Pipe Material:	Steel
Direction:	Downstream

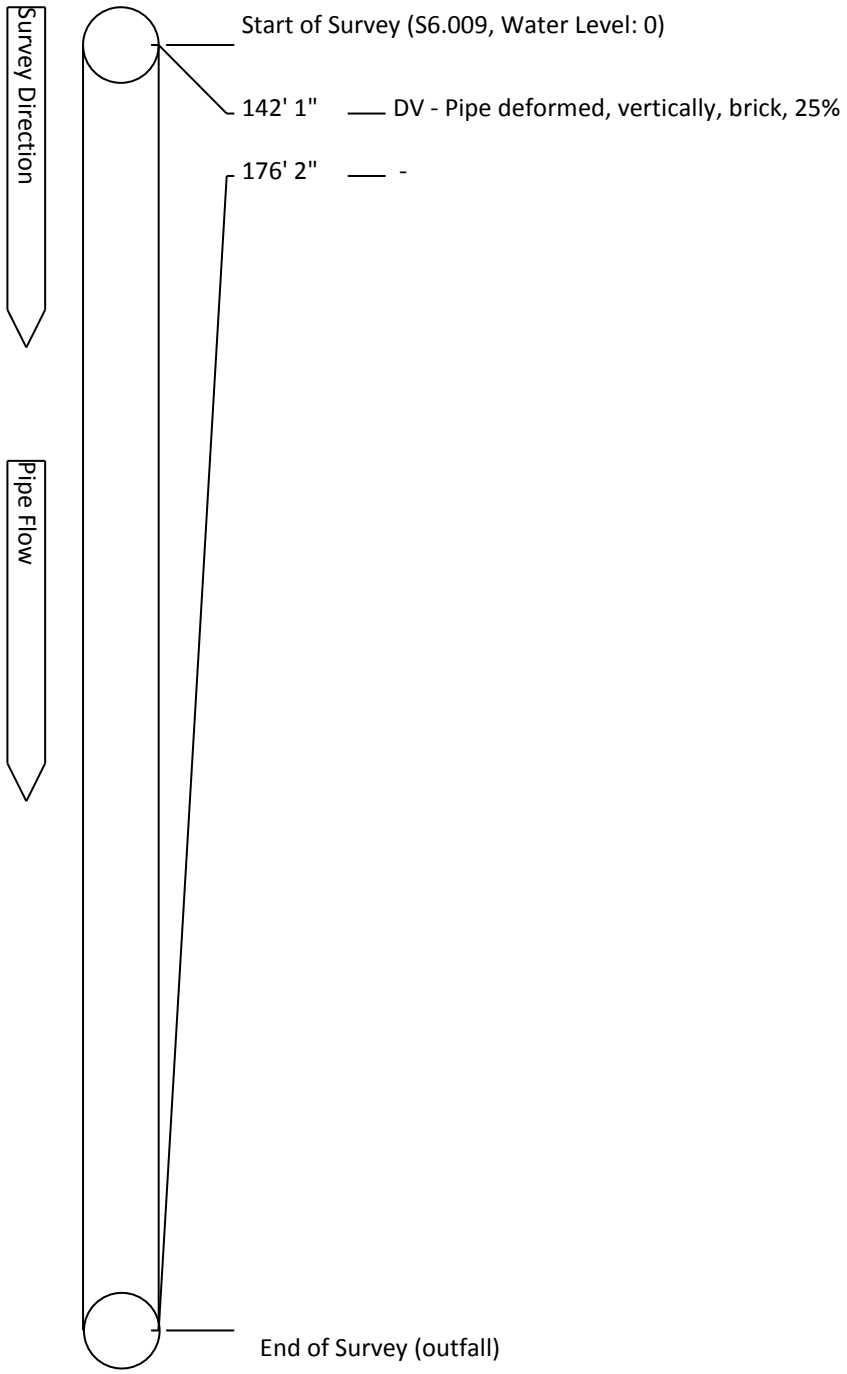
Observations

Crew:					
Survey Customer:	VT Underground Locating				
Job Ref:		**Survey Date:**	7/2/2019		
Survey Address:	106 NCO Dr				
Start:	S6.009	**Finish:**	Outfall		
Depth at Start Node:		**Depth at Finish Node:**			
Direction:	Downstream	**Height:**			
Length Surveyed:					
Material:	Steel	**Size**:	Medium	**Shape:**	Circular

Position	Code	Description/Remarks	Grade	Photo
142’ 1”	DV	Pipe deformed, vertically, brick, 25%.		 02Jul_003.JPG
176’ 2”		. end survey		 02Jul_004.JPG

Pipe Graphic

Crew:					
Survey Customer:	VT Underground Locating				
Job Ref:		**Survey Date:**	7/2/2019		
Survey Address:	106 NCO Dr				
Start:	S6.009	**Finish:**	Outfall		
Depth at Start Node:		**Depth at Finish Node:**			
Direction:	Downstream	**Height:**			
Length Surveyed:					
Material:	Steel	**Size**:	Medium	**Shape:**	Circular



Observation Table

Crew:					
Survey Customer:	VT Underground Locating				
Job Ref:		**Survey Date:**	7/2/2019		
Survey Address:	106 NCO Dr				
Start:	S6.009	**Finish:**	Outfall		
Depth at Start Node:		**Depth at Finish Node:**			
Direction:	Downstream	**Height:**			
Length Surveyed:					
Material:	Steel	**Size**:	Medium	**Shape:**	Circular

Code and Description			**Grade**	**Cont. Defect**	**VALUE**				**Clock**	
						mm		**%**	**At/From**	**To**
Position	**Code**	**Description**			**SML**	1st	2nd			
142’ 1”	DV	Pipe deformed, vertically, brick, ...%						25		
176’ 2”										

Comments

Survey details

Survey Date:	7/2/2019
Our Reference:	
Use:	Surface water
Purpose:	Invest. of infiltration problems
Weather:	No rain or snow
Pipe Height/Diameter:	
Pipe Width:	
Pipe Size:	Large
Pipe Shape:	Circular
Pipe Material:	Steel
Direction:	Downstream

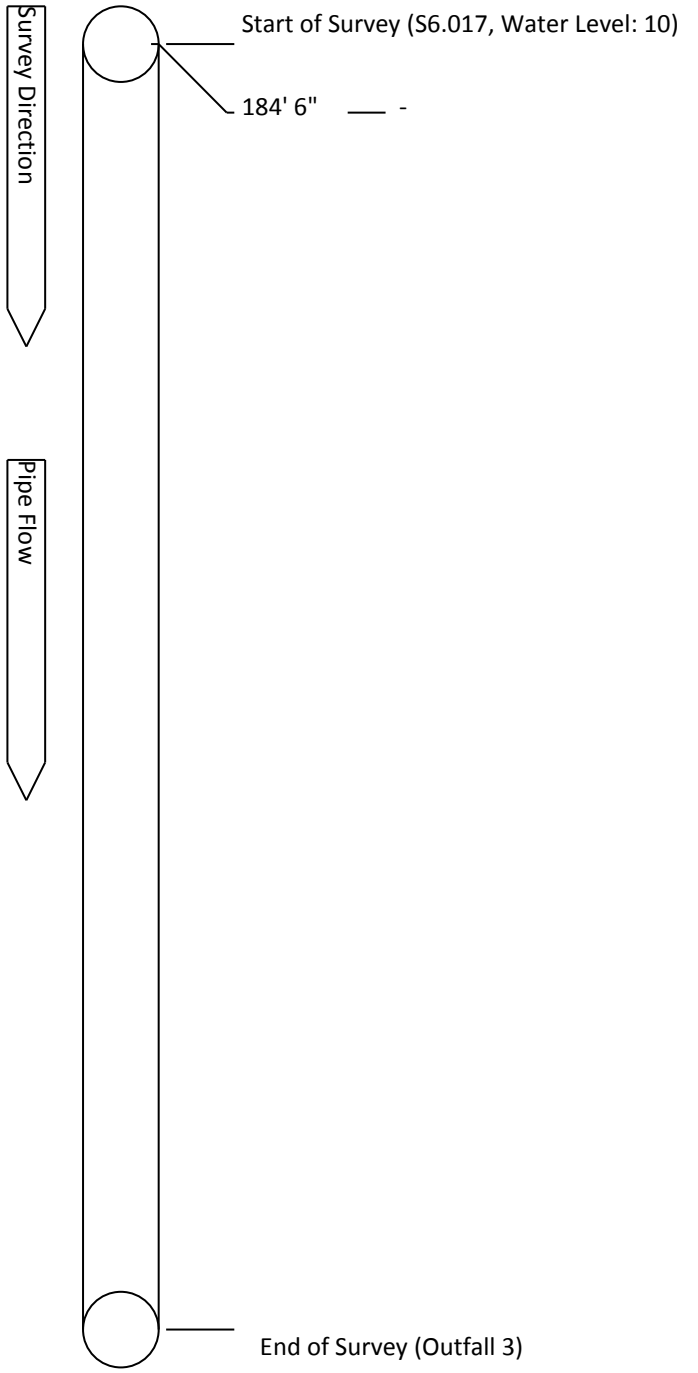
Observations

Crew:					
Survey Customer:	VT Underground Locating				
Job Ref:		**Survey Date:**	7/2/2019		
Survey Address:	106 NCO Dr				
Start:	S6.017	**Finish:**	Outfall 3		
Depth at Start Node:		**Depth at Finish Node:**			
Direction:	Downstream	**Height:**			
Length Surveyed:					
Material:	Steel	**Size**:	Large	**Shape:**	Circular

Position	Code	Description/Remarks	Grade	Photo
184’ 6”		. end survey		 02Jul_003.JPG

Pipe Graphic

Crew:					
Survey Customer:	VT Underground Locating				
Job Ref:		**Survey Date:**	7/2/2019		
Survey Address:	106 NCO Dr				
Start:	S6.017	**Finish:**	Outfall 3		
Depth at Start Node:		**Depth at Finish Node:**			
Direction:	Downstream	**Height:**			
Length Surveyed:					
Material:	Steel	**Size**:	Large	**Shape:**	Circular



Observation Table

Crew:					
Survey Customer:	VT Underground Locating				
Job Ref:		**Survey Date:**	7/2/2019		
Survey Address:	106 NCO Dr				
Start:	S6.017	**Finish:**	Outfall 3		
Depth at Start Node:		**Depth at Finish Node:**			
Direction:	Downstream	**Height:**			
Length Surveyed:					
Material:	Steel	**Size**:	Large	**Shape:**	Circular

Code and Description			**Grade**	**Cont. Defect**	**VALUE**				**Clock**	
						mm		**%**	**At/From**	**To**
Position	**Code**	**Description**			**SML**	1st	2nd			
184’ 6”										

Comments

Survey details

Survey Date:	7/2/2019
Our Reference:	
Use:	Surface water
Purpose:	Invest. of infiltration problems
Weather:	No rain or snow
Pipe Height/Diameter:	
Pipe Width:	
Pipe Size:	Large
Pipe Shape:	Circular
Pipe Material:	Steel
Direction:	Downstream

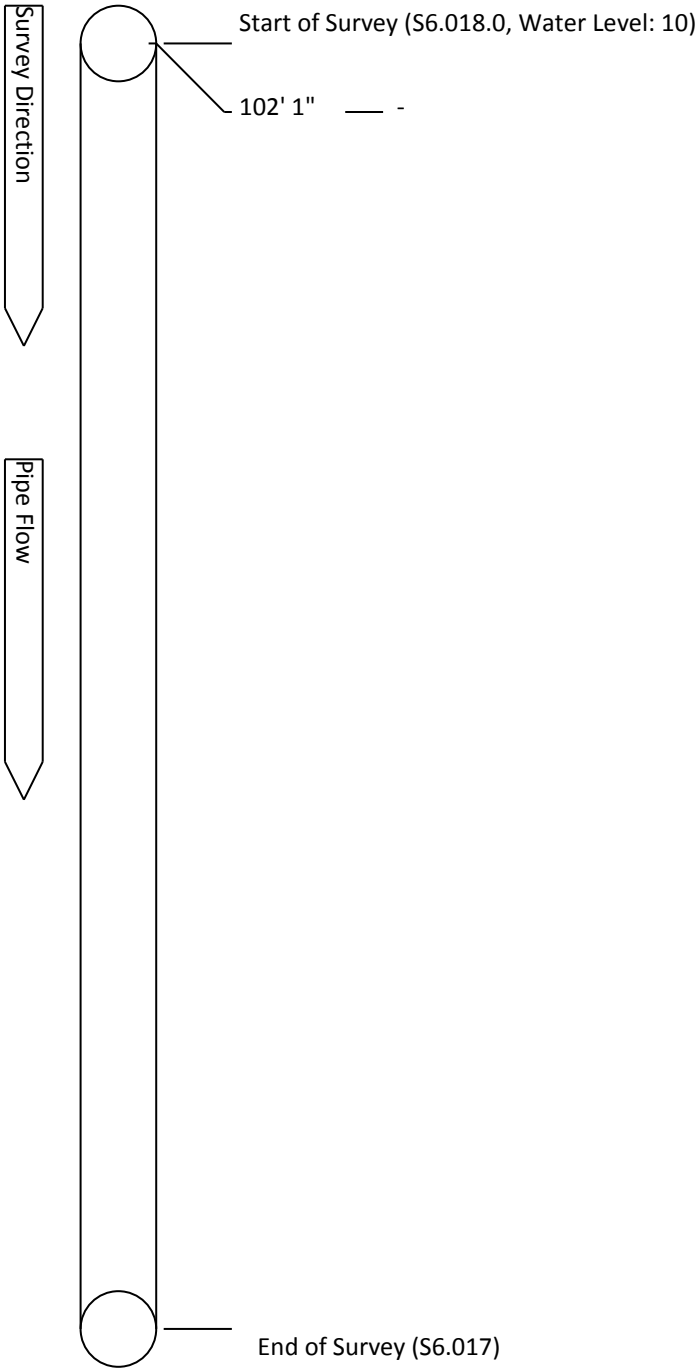
Observations

Crew:					
Survey Customer:	VT Underground Locating				
Job Ref:		**Survey Date:**	7/2/2019		
Survey Address:	106 NCO Dr				
Start:	S6.018.0	**Finish:**	S6.017		
Depth at Start Node:		**Depth at Finish Node:**			
Direction:	Downstream	**Height:**			
Length Surveyed:					
Material:	Steel	**Size**:	Large	**Shape:**	Circular

Position	Code	Description/Remarks	Grade	Photo
102’ 1”		. end survey		 02Jul_001.JPG

Pipe Graphic

Crew:					
Survey Customer:	VT Underground Locating				
Job Ref:		**Survey Date:**	7/2/2019		
Survey Address:	106 NCO Dr				
Start:	S6.018.0	**Finish:**	S6.017		
Depth at Start Node:		**Depth at Finish Node:**			
Direction:	Downstream	**Height:**			
Length Surveyed:					
Material:	Steel	**Size**:	Large	**Shape:**	Circular



Observation Table

Crew:					
Survey Customer:	VT Underground Locating				
Job Ref:		**Survey Date:**	7/2/2019		
Survey Address:	106 NCO Dr				
Start:	S6.018.0	**Finish:**	S6.017		
Depth at Start Node:		**Depth at Finish Node:**			
Direction:	Downstream	**Height:**			
Length Surveyed:					
Material:	Steel	**Size**:	Large	**Shape:**	Circular

Code and Description			Grade	Cont. Defect	VALUE				Clock	
						mm		%	At/From	To
Position	**Code**	**Description**			**SML**	1st	2nd			
102' 1"										

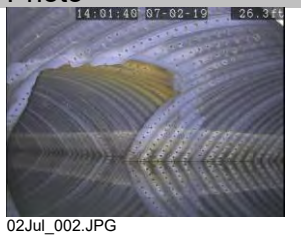
Comments

Survey details

Survey Date:	7/2/2019
Our Reference:	
Use:	Surface water
Purpose:	Invest. of infiltration problems
Weather:	No rain or snow
Pipe Height/Diameter:	
Pipe Width:	
Pipe Size:	
Pipe Shape:	Circular
Pipe Material:	Steel
Direction:	Upstream

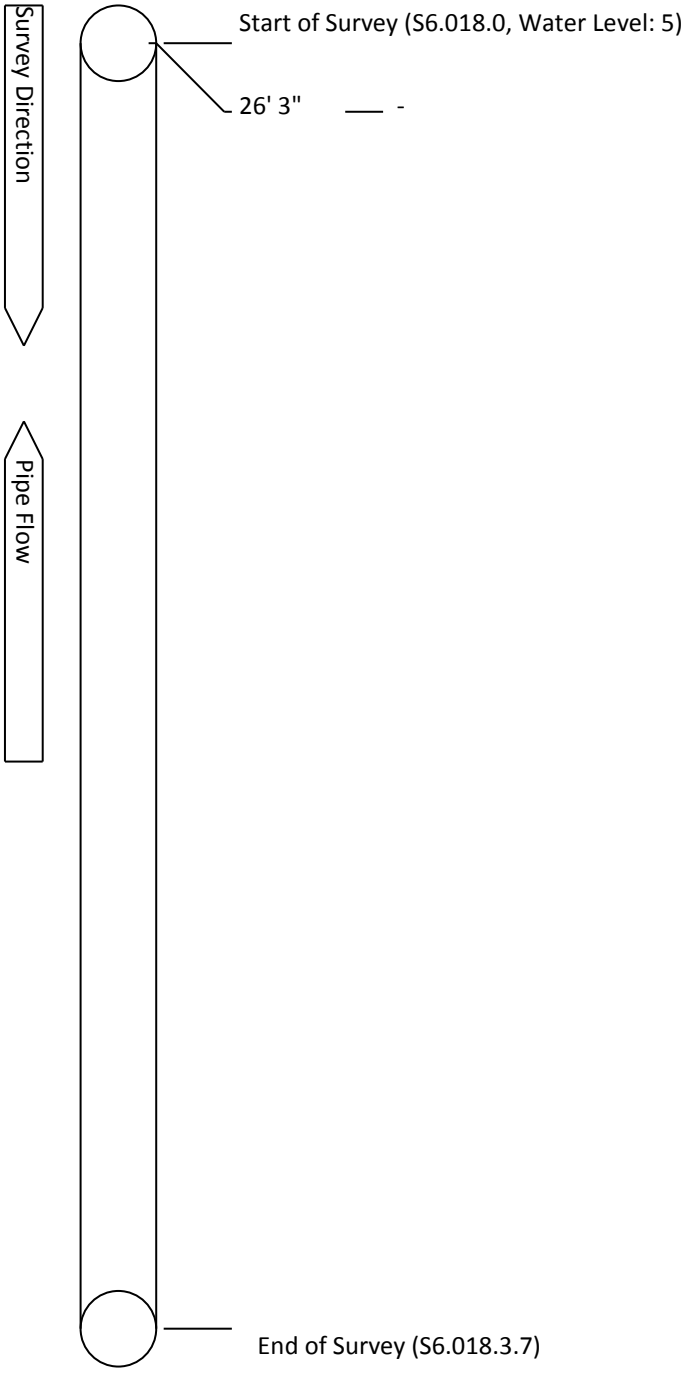
Observations

Crew:					
Survey Customer:	VT Underground Locating				
Job Ref:		**Survey Date:**	7/2/2019		
Survey Address:	106 NCO Dr				
Start:	S6.018.0	**Finish:**	S6.018.3.7		
Depth at Start Node:		**Depth at Finish Node:**			
Direction:	Upstream	**Height:**			
Length Surveyed:					
Material:	Steel	**Size**:		**Shape:**	Circular

Position	Code	Description/Remarks	Grade	Photo
26’ 3”		. end survey		 02Jul_002.JPG

Pipe Graphic

Crew:					
Survey Customer:	VT Underground Locating				
Job Ref:		**Survey Date:**	7/2/2019		
Survey Address:	106 NCO Dr				
Start:	S6.018.0	**Finish:**	S6.018.3.7		
Depth at Start Node:		**Depth at Finish Node:**			
Direction:	Upstream	**Height:**			
Length Surveyed:					
Material:	Steel	**Size**:		**Shape:**	Circular



Observation Table

Crew:					
Survey Customer:	VT Underground Locating				
Job Ref:		**Survey Date:**	7/2/2019		
Survey Address:	106 NCO Dr				
Start:	S6.018.0	**Finish:**	S6.018.3.7		
Depth at Start Node:		**Depth at Finish Node:**			
Direction:	Upstream	**Height:**			
Length Surveyed:					
Material:	Steel	**Size**:		**Shape:**	Circular

Code and Description			Grade	Cont. Defect	VALUE				Clock	
						mm		%	At/From	To
Position	**Code**	**Description**			**SML**	1st	2nd			
26’ 3”										

Comments

Survey details

Survey Date:	7/2/2019
Our Reference:	
Use:	Surface water
Purpose:	Invest. of infiltration problems
Weather:	No rain or snow
Pipe Height/Diameter:	
Pipe Width:	
Pipe Size:	Medium
Pipe Shape:	Circular
Pipe Material:	Steel
Direction:	Upstream

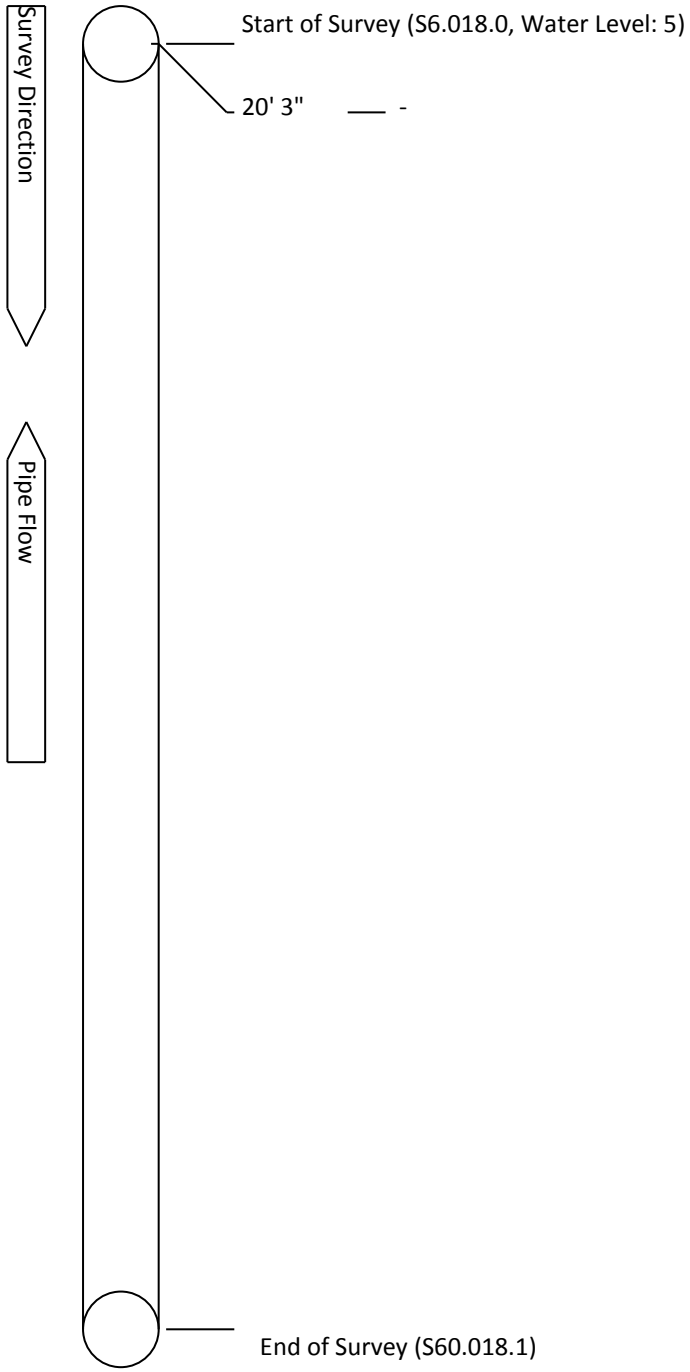
Observations

Crew:					
Survey Customer:	VT Underground Locating				
Job Ref:		**Survey Date:**	7/2/2019		
Survey Address:	106 NCO Dr				
Start:	S6.018.0	**Finish:**	S60.018.1		
Depth at Start Node:		**Depth at Finish Node:**			
Direction:	Upstream	**Height:**			
Length Surveyed:					
Material:	Steel	**Size**:	Medium	**Shape:**	Circular

Position	Code	Description/Remarks	Grade	Photo
20’ 3”		. end survery		 02Jul_002.JPG

Pipe Graphic

Crew:					
Survey Customer:	VT Underground Locating				
Job Ref:		**Survey Date:**	7/2/2019		
Survey Address:	106 NCO Dr				
Start:	S6.018.0	**Finish:**	S60.018.1		
Depth at Start Node:		**Depth at Finish Node:**			
Direction:	Upstream	**Height:**			
Length Surveyed:					
Material:	Steel	**Size**:	Medium	**Shape:**	Circular



Observation Table

Crew:					
Survey Customer:	VT Underground Locating				
Job Ref:		**Survey Date:**	7/2/2019		
Survey Address:	106 NCO Dr				
Start:	S6.018.0	**Finish:**	S60.018.1		
Depth at Start Node:		**Depth at Finish Node:**			
Direction:	Upstream	**Height:**			
Length Surveyed:					
Material:	Steel	**Size**:	Medium	**Shape:**	Circular

Code and Description			Grade	Cont. Defect	VALUE				Clock	
						mm		%	At/From	To
Position	**Code**	**Description**			**SML**	1st	2nd			
20’ 3”										

Comments

APPENDIX L Investigation-Derived Waste Documentation

NON-HAZARDOUS WASTE MANIFEST

1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Waste Tracking Number
VT6 572 824 294	1	303-253-1749	5-654401

GENERATOR

5. Generator's Name and Mailing Address
Burlington Air National Guard
30 Falcon Street, Soouth Burlington, VT 05403
Generator's Phone: 802-660-5966 Attn: Shannon Kelly

Generator's Site Address (if different than mailing address)
Burlington Air National Guard
Same
720-229-3721 Kylah Wyatt

6. Transporter 1 Company Name: Freehold Cartage Inc. — U.S. EPA ID Number: NJD 054 126 164

7. Transporter 2 Company Name — U.S. EPA ID Number:

8. Designated Facility Name and Site Address
Envirosafe Services Of Ohio, Inc.
876 Otter Creek Road, Oregon, OH 43616
Facility's Phone: 800-537-0426 — U.S. EPA ID Number: OHD 045 243 706

	9. Waste Shipping Name and Description	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	
1.	Non RCRA, Non DOT, Regulated waste soil	5	DM	2400	P	
2.	Non RCRA, Non DOT, Regulated waste soil ~~Not Shipped~~ (m)	~~7~~ (m)	TP	~~800~~	P	
3.						
4.						

13. Special Handling Instructions and Additional Information
1. App# 15125 (nonhazardous soil) drums
2. App# 15125 (nonhazardous soil) totes
CESI Job: Tfort
Emergency Response Contact: Kristi Diller - 303-253-1749
4160165

INT'L

14. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Generator's/Offeror's Printed/Typed Name: Peter Default — Signature: Peter Default — Month 9 | Day 25 | Year 19

15. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter Signature (for exports only): Date leaving U.S.:

TRANSPORTER

16. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: Michael Brochu — Signature — Month 09 | Day 25 | Year 19

Transporter 2 Printed/Typed Name — Signature — Month | Day | Year

DESIGNATED FACILITY

17. Discrepancy

17a. Discrepancy Indication Space ☒ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Generator quantity estimated per SH/ko 10/1/19
Manifest Reference Number:

17b. Alternate Facility (or Generator) — U.S. EPA ID Number
Facility's Phone:

17c. Signature of Alternate Facility (or Generator) — Month | Day | Year

18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a

Printed/Typed Name: Raleigh Oleksiak — Signature — Month 10 | Day 10 | Year 19

ESOI/Envirosafe Services of Ohio, Inc.
Associated Chemical and Environmental Services, Inc.
878 Otter Creek Rd.
Oregon, Ohio 43616-1200

USEPA ID OHD045243706
Ohio EPA 03-48-0092

Certificate of Disposal

PART A --Generator Information

Generator Name BURLINGTON AIR NATIONAL GUARD Generator USEPA ID # VT6572824294

Manifest Document No. S-654401

PART B --Waste Disposal Information

Profile	Document	Disposal Date	Disposal Method	Container No. & Type		Weight
15125	B91010022		D080	5	DM	
15125	B91010022			5	DM	
15125	B91010022			5	DM	4160 lbs
15125	B91010022			5	DM	
15125	B91010022	10-16-19		5	DM	
15125	B91010022			7	DM	
15125	B91010022			7	DM	
15125	B91010022			7	DM	
15125	B91010022			7	DM	
15125	B91010022			7	DM	
15125	B91010022			7	DM	
15125	B91010022			7	DM	

Disposal Method = D080 - Landfill; T04 - Treatment

Container Types = DR - Drum; TR - Truck; CT - Cargo Tanker; VT - Vacuum Tanker; RO - Rolloff; CM - Container Metal

I certify receipt and disposal of the above identified wastes at this facility. I certify that the above described wastes were disposed according to all applicable state & federal requirements imposed by the generator.

SIGNATURE Haleigh Oleksiak DATE 10-16-19

TITLE _____

C:\Documents and Settings\l.humphrey\My Documents\oh_cert_disp.rpt

APPENDIX M Laboratory Analytical Reports

Laboratory Analytical Reports will be presented in the Final version of this Expanded Site Inspection Report, or upon request.

APPENDIX N Data Validation Reports

DATA VALIDATION SUMMARY REPORT

for samples collected from

BURLINGTON AIR NATIONAL GUARD BASE

SOUTH BURLINGTON, VERMONT

Data Validation by: Beth Driskill

Report Date: August 21, 2019

Parsons - Austin

INTRODUCTION

The following data validation summary report covers one source blank (SB) and one equipment blank (EB). The samples were collected from Burlington Air National Guard (ANG) Base in South Burlington, Vermont on May 21, 2019. The samples were logged under the following Sample Delivery Group (SDG):

2045561

The QC samples in this SDG were analyzed for per- and polyfluoroalkyl substances (PFAS) by U.S. EPA Method 537 modified. The following table details the sample IDs and requested parameters. Both samples in this SDG are field quality control (QC) samples.

The source blank consisted of onsite tap water used to rinse all reusable equipment poured directly into the appropriate clean sampling container. The source blank is associated with all field samples collected using decontaminated equipment. The equipment blank consisted of laboratory certified PFAS-free water poured over the field tablet and collected directly into the appropriate clean sampling container. The field tablet is used onsite and an equipment blank was collected to ensure the tablet was not a contributing source of contamination.

All samples were collected by Parsons and were hand delivered on ice to Eurofins TestAmerica in South Burlington, Vermont (TA-Burlington) under SDG number 320-50486 in one cooler on May 21, 2019. TA-Burlington then shipped the samples to Eurofins Lancaster Laboratories Environmental (ELLE). The planning documents for this site originally indicated the samples would be analyzed by TestAmerica in Sacramento, California (TA-Sacramento). However, upon initiation of the project, TA-Sacramento did not have sufficient capacity to meet the requirements of the project and therefore, the work was transferred to ELLE. ELLE performed all analyses related to this project. The samples were received by ELLE in good condition and at an acceptable temperature of 4.9 degrees Celsius.

All samples were prepared and analyzed following the procedures outlined in the project-specific Uniform Federal Policy - Quality Assurance Project Plan (UFP-QAPP) and the Department of Defense (DoD) Quality Systems Manual (QSM) Version 5.1.

SAMPLE IDs AND REQUESTED PARAMETERS

Sample ID	Matrix	PFAS	COMMENTS
BRLTN-FDTAP-SB	Water	X	Source Blank
BRLTN-TABLET-EB	Water	X	Equipment Blank

EXTRACTION, ANALYTICAL, AND REPORTING DETAILS

Parameter	Matrix	Prep Method	Analytical Method	Units
PFAS	Water	EPA 537 Modified*	EPA 537 Modified*	ng/l

ng/l = nanogram per liter

* PFAS by LC/MS/MS Compliant with QSM 5.1 Table B-15

EVALUATION CRITERIA

The Level IV data package submitted by the laboratory has been reviewed and verified following the guidelines outlined in the project-specific UFP-QAPP and DoD QSM 5.1. Data qualification was performed following the spirit of the National Functional Guidelines for Organic Data Review even though this document does not specifically include the method for PFAS.

Information reviewed in the data packages included sample results; field and laboratory quality control results; instrument calibration; calibration verifications; case narratives; sample receipt forms, and chain-of-custody (COC) forms. The analyses and findings presented in this report are based on the reviewed information, and whether guidelines in the associated analytical method, DoD QSM and QAPP were met. It should be noted that the final approved QAPP for this project indicated TestAmerica Sacramento was the primary laboratory. However, due to capacity issues with the laboratory, all samples were sent to, and analyzed by, ELLE. Therefore, the accuracy tolerances reported in the data packages do not match those listed in the project QAPP. Per the DOD QSM 5.1, statistically derived in-house tolerances should be used for PFAS analysis. As these tolerances differ between laboratories, the limits listed in the analytical reports from ELLE were used to evaluate accuracy.

External Injection Standard (EIS) responses were only used to qualify data when the recovery was excessively high or excessively low. Data associated with EIS recoveries below 10% or above 190% were rejected. Data associated with EIS recoveries below 20% but at or above 10%, or above 180% but at or below 190%, were qualified “J” as estimated. At these extremes, the associated sample data were considered impacted and estimated, or significantly impacted and rejected. Data associated with EIS recoveries between 20% and 180% were not considered significantly impacted and no data qualifiers were applied for EIS recoveries within this range.

A table detailing the data qualifiers applied, removed, or changed for the samples in this SDG as a result of the data validation process is included at the end of this report.

PFAS

General

The PFAS portion of this SDG consisted of one source blank and one equipment blank. The samples were collected on May 21, 2019 and were analyzed for the following target list of 24 PFAS compounds as specified in the project-specific UFP-QAPP.

Analyte	CAS Number
Perfluorobutanoic acid (PFBA)	375-22-4
Perfluoropentanoic acid (PFPeA)	2706-90-3
Perfluorohexanoic acid (PFHxA)	307-24-4
Perfluoroheptanoic acid (PFHpA)	375-85-9
Perfluorooctanoic acid (PFOA)	335-67-1
Perfluorononanoic acid (PFNA)	375-95-1
Perfluorodecanoic acid (PFDA)	335-76-2
Perfluoroundecanoic acid (PFUnA)	2058-94-8
Perfluorododecanoic acid (PFDoA)	307-55-1
Perfluorotridecanoic acid (PFTriA)	72629-94-8
Perfluorotetradecanoic acid (PFTeA)	376-06-7
Perfluorobutanesulfonic acid (PFBS)	375-73-5
Perfluorohexanesulfonic acid (PFHxS)	355-46-4
Perfluoroheptanesulfonic acid (PFHpS)	375-92-8
Perfluorooctanesulfonic acid (PFOS)	1763-23-1
Perfluorodecanesulfonic acid (PFDS)	335-77-3
Perfluorooctane sulfonamide (PFOSA)	754-91-6
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	2991-50-6
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	2355-31-9
1H,1H,2H,2H-perfluorooctane sulfonate (6:2 FTS)	27619-97-2
1H,1H,2H,2H-perfluorodecane sulfonate (8:2 FTS)	39108-34-4
1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2 FTS)	757124-72-4
Perflouro-1-nonanesulfonate (PFNS)	68259-12-1
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4

The PFAS analyses were performed in accordance with U.S. EPA Method 537 Modified (PFAS by LC/MS/MS Compliant with QSM 5.1 Table B-15). All samples in this SDG were analyzed following the procedures outlined in the DoD QSM, version 5.1 and the project-specific UFP-QAPP with exception of the previously noted accuracy tolerances.

The samples were prepared and analyzed within the holding time required by the method. The samples were prepared and analyzed in two batches. The samples were analyzed on one instrument under two initial calibrations (ICALs). All analyses were performed undiluted.

Accuracy

Accuracy was evaluated using the percent recovery (%R) obtained from the laboratory control sample (LCS), LCS duplicate (LCSD) if analyzed, the Extracted Internal Standards (EIS), and the Injection Internal Standards (IIS). It should be noted that the laboratory report occasionally references the EIS as surrogate standards.

All LCS and LCSD recoveries were within acceptance criteria.

All EIS recoveries were within acceptance criteria except as follows:

Sample ID	Surrogate	%R	Criteria
BRLTN-FDTAP-SB	13C2-PFTeDA	11	20-180%

The original analysis of this sample demonstrated non-compliant recoveries for several EIS compounds. The sample was reanalyzed, and the second analysis yielded slightly better recoveries. Therefore, the results from the reanalysis were used as final. The non-compliant compounds noted in the table above correspond to the reanalysis. The associated native sample concentration for sample BRLTN-FDTAP-SB was qualified "UJ" as estimated due to recoveries below 20%.

All IIS recoveries were within acceptance criteria.

Precision

Precision was evaluated using the relative percent difference (RPD) obtained from the LCS/LCSD analyte results.

All LCS/LCSD RPDs were within acceptance criteria.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the DoD QSM and project-specific UFP-QAPP;
- Comparing actual analytical procedures to those described in the DoD QSM and project-specific UFP-QAPP;
- Evaluating holding times; and
- Examining laboratory blanks for cross contamination of samples during analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the DoD QSM and project-specific UFP-QAPP. All samples were prepared and analyzed within the holding time required by the method. The following QC elements were also evaluated:

- All initial calibration criteria were met.
- All initial calibration verification (ICV) criteria were met.
- All continuing calibration verification (CCV) criteria were met.
- All instrument sensitivity check (ISC) criteria were met.

- Raw data was spot-checked for qualitative and quantitative accuracy.

Two laboratory method blanks were associated with the PFAS analyses in this SDG. The laboratory method blanks were non-detect for all target analytes.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All results for PFAS for the samples in this SDG were considered usable. Therefore, the completeness for the PFAS portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

COMPARABILITY

All data was generated using contract-specific standard methods and reported with known data quality, type of analysis, units, etc.

SENSITIVITY

The LOD and LOQ values reported for the samples were compared to those listed in the QAPP to ensure that sensitivity requirements were met. Sample LODs and LOQs were adjusted based on dilution and/or initial/final volumes.

The LOD and LOQ values were below the project action limit (PAL) listed in the QAPP for all target PFAS.

DATA USABILITY

The purpose of this data validation report is to ensure the integrity and reliability of analytical laboratory data. The data quality is evaluated based on precision, accuracy, representativeness, comparability, and completeness (PARCC) characteristics of the data. The validated data indicated that the laboratory correctly performed the analyses. Based on the data quality assessment, no results were rejected. Although minor QC exceedances were identified for this data set, all data is considered usable for the purposes of this project.

DATA QUALIFIER CHANGES

The following data qualifiers were added, removed, or changed as a result of the data validation process:

Sample ID	Analyte	Units	Original Result	Final Result	Reason Code
BRLTN-FDTAP-SB	PFTeA	ng/g	1.1 U	1.1 UJ	I12

DATA QUALIFIER DEFINITIONS

The data qualifiers are defined in Table 36.2 of the project-specific UFP-QAPP, as follows:

R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified. The data is unusable.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected. However, the reported LOD is approximate and may or may not accurately and precisely represent the concentration necessary to detect the analyte in the sample.
U	Analyte was not detected and is reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.

REASON CODE DEFINITIONS

Reason codes were used to document the logic behind all data validation qualifiers. The following reason codes for data qualification were associated with the samples in this SDG:

I12: EIS percent recovery infraction with no assignable bias

DATA VALIDATION SUMMARY REPORT

for samples collected from

BURLINGTON AIR NATIONAL GUARD BASE

SOUTH BURLINGTON, VERMONT

Data Validation by: Beth Driskill

Report Date: February 4, 2020

Parsons - Austin

INTRODUCTION

The following data validation summary report covers five (5) soil samples, two (2) equipment blanks (EBs), and one (1) field blank (FB). The samples were collected from Burlington Air National Guard (ANG) Base in South Burlington, Vermont on May 30, 2019. The samples were logged under the following Sample Delivery Group (SDG):

2046856

The samples in this SDG were analyzed for the following parameters: per- and polyfluoroalkyl substances (PFAS) by U.S. EPA Method 537 modified, metals (Ca, Fe, Mn, and K) by SW6010C, anions (chloride and sulfate) by SW9056A, total organic carbon (TOC) by SW9060A, and pH by SW9045D. Not all samples were analyzed for all parameters. The following table details the samples included in this SDG and the analytical parameters performed. The field quality control (QC) samples associated with the samples in this SDG included one field duplicate (FD), one matrix spike/matrix spike duplicate (MS/MSD) pair, two EBs, one FB, and one source blank (SB) sample. The SB was collected on May 21, 2019 and was reported in SDG 2045561. The field QC samples were analyzed for PFAS only as noted in the following table. Percent moisture was determined for all soil samples.

All samples were collected by Parsons and were hand delivered on ice to Eurofins TestAmerica (TA) in South Burlington, Vermont in one cooler on May 30, 2019. TA-Burlington then shipped the samples to Eurofins Lancaster Laboratories Environmental (ELLE). The planning documents for this site originally indicated the samples would be analyzed by TestAmerica in Sacramento, California (TA-Sacramento). However, upon initiation of the project, TA-Sacramento did not have sufficient capacity to meet the requirements of the project and therefore, the work was transferred to ELLE. ELLE performed all analyses related to this project. The samples were received by ELLE in good condition and at an acceptable temperature of 1.6 degrees Celsius.

It should be noted that sulfide analysis was included on the chain-of-custody (COC) but the analysis was cancelled as ELLE was unable to perform this parameter. In addition, sample BRLTN-004-SO-6.0-6.5 was marked on the COC for all analyses but all analyses were cancelled with the exception of PFAS. Only the three samples with the highest PFAS concentrations were required to be analyzed for the additional parameters.

All samples were prepared and analyzed following the procedures outlined in the project-specific Uniform Federal Policy - Quality Assurance Project Plan (UFP-QAPP) and the Department of Defense (DoD) Quality Systems Manual (QSM) Version 5.1

SAMPLE IDs AND REQUESTED PARAMETERS

Sample ID	Matrix	PFAS	Metals	Anions	TOC	pH	Comments
BRLTN-003-SO-5.0-5.5	Soil	X	X	X	X	X	
BRLTN-093-SO-5.0-5.5	Soil	X					FD of BRLTN-003-SO-5.0-5.5
BRLTN-003-SO-7.0-7.5	Soil	X	X	X	X	X	MS/MSD
BRLTN-004-SO-5.0-5.5	Soil	X	X	X	X	X	
BRLTN-004-SO-6.0-6.5	Soil	X				X	
BRLTN-053019-EB-SB	QC	X					EB from stainless steel bowl
BRLTN-053019-EB-DR	QC	X					EB from drill rod
BRLTN-053019-FB	QC	X					Field blank

QC = Water Quality Control samples.

EXTRACTION, ANALYTICAL, AND REPORTING DETAILS

Parameter	Matrix	Prep Method	Analytical Method	Units
PFAS	Soil	EPA 537 Modified	EPA 537 Modified*	ng/g
Metals	Soil	SW3050B	SW6010C	mg/kg
Anions	Soil	SW9056A	SW9056A	mg/kg
TOC	Soil	SW9060A	SW9060A	mg/kg
pH	Soil	SW9045D	SW9045D	pH units
PFAS	Water	EPA 537 Modified	EPA 537 Modified*	ng/l

Note: PFAS units for soil in the QAPP are in ug/kg (ppb). Lab reported soils in units of ng/g (ppb).

* PFAS by LC/MS/MS Compliant with QSM 5.1 Table B-15

EVALUATION CRITERIA

The Level IV data package submitted by the laboratory has been reviewed and verified following the guidelines outlined in the project-specific UFP-QAPP and DoD QSM 5.1. Data qualification was performed following the spirit of the National Functional Guidelines for Organic Data Review even though this document does not specifically include the method for PFAS.

Information reviewed in the data packages included sample results; field and laboratory quality control results; instrument calibration; calibration verifications; case narratives; sample receipt forms, and chain-of-custody (COC) forms. The analyses and findings presented in this report are based on the reviewed information, and whether guidelines in the associated analytical method, DoD QSM and QAPP were met. It should be noted that the final approved QAPP for this project indicated TestAmerica Sacramento was the primary laboratory. However, due to capacity issues with the laboratory, all samples were sent to and analyzed by, ELLE. Therefore, the accuracy tolerances reported in the data packages do not match those listed in the project QAPP. Per the DOD QSM 5.1, statistically derived in-house tolerances should be used for PFAS analysis. As these tolerances differ between laboratories, the limits listed in the analytical reports from ELLE were used to evaluate accuracy.

External Injection Standard (EIS) responses were only used to qualify data when the recovery was excessively high or excessively low. Data associated with EIS recoveries below 10% or above 190% were rejected. Data associated with EIS recoveries below 20% but at or above 10%, or above 180% but at or below 190%, were qualified "J" as estimated. At these extremes, the associated sample data were considered impacted and estimated, or significantly impacted and rejected. Data associated with EIS recoveries between 20% and 180% were not considered significantly impacted and no data qualifiers were applied for EIS recoveries within this range.

A table detailing the data qualifiers applied, removed, or changed for the samples in this SDG as a result of the data validation process is included at the end of this report.

PFAS

General

The PFAS portion of this SDG consisted of eight (8) samples, including five (5) environmental soil samples, two (2) EBs, and one (1) FB. The samples were collected on May 30, 2019 and were analyzed for the following target list of 24 PFAS compounds as specified in the project-specific UFP-QAPP.

Analyte	CAS Number
Perfluorobutanoic acid (PFBA)	375-22-4
Perfluoropentanoic acid (PFPeA)	2706-90-3
Perfluorohexanoic acid (PFHxA)	307-24-4
Perfluoroheptanoic acid (PFHpA)	375-85-9
Perfluorooctanoic acid (PFOA)	335-67-1
Perfluorononanoic acid (PFNA)	375-95-1
Perfluorodecanoic acid (PFDA)	335-76-2
Perfluoroundecanoic acid (PFUnA)	2058-94-8
Perfluorododecanoic acid (PFDoA)	307-55-1
Perfluorotridecanoic acid (PFTriA)	72629-94-8
Perfluorotetradecanoic acid (PFTeA)	376-06-7

Analyte	CAS Number
Perfluorobutanesulfonic acid (PFBS)	375-73-5
Perfluorohexanesulfonic acid (PFHxS)	355-46-4
Perfluoroheptanesulfonic acid (PFHpS)	375-92-8
Perfluorooctanesulfonic acid (PFOS)	1763-23-1
Perfluorodecanesulfonic acid (PFDS)	335-77-3
Perfluorooctane sulfonamide (PFOSA)	754-91-6
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	2991-50-6
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	2355-31-9
1H,1H,2H,2H-perfluorooctane sulfonate (6:2 FTS)	27619-97-2
1H,1H,2H,2H-perfluorodecane sulfonate (8:2 FTS)	39108-34-4
1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2 FTS)	757124-72-4
Perflouro-1-nonanesulfonate (PFNS)	68259-12-1
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4

The PFAS analyses were performed in accordance with U.S. EPA Method 537 Modified (PFAS by LC/MS/MS Compliant with QSM 5.1 Table B-15). All samples in this SDG were analyzed following the procedures outlined in the DoD QSM, version 5.1 and the project-specific UFP-QAPP with exception of the previously noted accuracy tolerances.

The samples were prepared and analyzed within the holding time required by the method. The samples were prepared and analyzed in two batches. The samples were analyzed on one instrument under two initial calibrations (ICALs). Several samples were reanalyzed due to QC related deficiencies. The laboratory reported the most compliant run for each sample. Only the final reported analyses and the associated QC are discussed in this report.

Accuracy

Accuracy was evaluated using the percent recovery (%R) obtained from the laboratory control sample (LCS), LCS duplicate (LCSD) if analyzed, MS, MSD, the Extracted Internal Standards (EIS), and the Injection Internal Standards (IIS). It should be noted that the laboratory report occasionally references the EIS as surrogate standards. Sample BRLTN-003-SO-7.0-7.5 was designated on the COC for MS/MSD analysis.

All LCS and LCSD recoveries were within acceptance criteria except as follows.

Batch # 19162016

Analyte	LCS %R	Criteria
PFOS	289	66-140%

The results for PFOS in the following samples associated with this LCS were qualified "J" as estimated with a potential high bias: BRLTN-003-SO-5.0-5.5, BRLTN-093-SO-5.0-5.5, BRLTN-003-SO-7.0-7.5, and BRLTN-004-SO-6.0-6.5.

Batch# 19164014

Analyte	LCS %R	Criteria
PFBA	159	79-146%

The result for PFBA in the associated sample, BRLTN-004-SO-5.0-5.5, was non-detect. Therefore, data quality was not affected, and no data was qualified.

All MS and MSD recoveries were within acceptance criteria except as follows:

BRLTN-003-SO-7.0-7.5

Analyte	MS %R	MSD %R	Criteria
PFBA	155	(146)	79-146%
PFHxS	-277	-263	75-131%
PFOA	-28	-72	80-140%
PFOS	-131	-37	66-140%

( ) indicates the recovery met criteria

The parent sample concentrations for PFHxS, PFOA, and PFOS were significantly greater than (more than 4 times) the amount spiked, resulting in the anomalous recoveries. Therefore, no corrective action was necessary for these analytes. PFBA was recovered high in the MS and was non-detect in the parent sample. Therefore, data quality was not affected, and no data was qualified.

All IIS recoveries were within acceptance criteria.

All EIS recoveries were within acceptance criteria except as follows:

Sample ID	Dilution	EIS	%R	Criteria
BRLTN-003-SO-5.0-5.5	1x	d3-NMeFOSAA	14	20-180%
BRLTN-093-SO-5.0-5.5	1x	d3-NMeFOSAA	11	
BRLTN-003-SO-7.0-7.5	1x	d3-NMeFOSAA	11	
BRLTN-003-SO-5.0-5.5	1x	d5-NetFOSAA	17	
BRLTN-093-SO-5.0-5.5	1x	d5-NetFOSAA	15	
BRLTN-003-SO-7.0-7.5	1x	d5-NetFOSAA	16	

The results associated with the non-compliant EIS were qualified as estimated and were flagged “UJ”.

Precision

Precision was evaluated using the relative percent difference (RPD) obtained from the MS/MSD analyte results. Precision was further evaluated by comparing the FD analyte results.

All MS/MSD RPDs were within acceptance criteria.

All field duplicate RPDs were within acceptance criteria.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the DoD QSM and project-specific UFP-QAPP;
- Comparing actual analytical procedures to those described in the DoD QSM and project-specific UFP-QAPP;
- Evaluating holding times; and
- Examining field and laboratory blanks for cross contamination of samples during collection and analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the DoD QSM and project-specific UFP-QAPP. All samples were prepared and analyzed within the holding time required by the method. The following QC elements were also evaluated:

- All initial calibration criteria were met.
- All initial calibration verification (ICV) criteria were met.
- All continuing calibration verification (CCV) criteria were met.
- All instrument sensitivity check (ISC) criteria were met.
- Raw data was spot-checked for qualitative and quantitative accuracy.
- Calculations were spot-checked and verified.

Three laboratory method blanks were associated with the PFAS analyses in this SDG. The laboratory method blanks were non-detect for all target PFAS analytes except as follows:

Method Blank ID	Analyte	Conc. (ng/g)	LOQ (ng/g)
BLK162016B	PFOS	2.0	0.80

PFOS was detected above the LOQ in the method blank. However, all samples associated with this method blank had PFOS concentrations greater than 5 times the method blank concentration. Therefore, data quality was not affected, and no data was qualified.

The source blank reported in SDG 2045561 was associated with all field samples in this SDG. The source blank sample consisted of onsite tap water used to rinse all reusable equipment. The source blank was non-detect for all target PFAS except as follows:

Source Blank ID	Analyte	Conc. (ng/L)	LOQ (ng/L)
BRLTN-FDTAP-SB	PFBS	0.39	1.8
	PFHpA	0.58	1.8
	PFHxS	0.48	1.8
	PFHxA	0.79	1.8
	PFOSA	1.1	2.7

	PFOS	1.0	1.8
	PFOA	1.1	1.8

Source blank results were reported in parts per trillion and soil units were reported in parts per billion. Due to the magnitude of difference in results, the soil sample results were not impacted by the low-level source blank contamination.

Two equipment blanks were associated with the soil samples in this SDG. The equipment blanks were non-detect for all target PFAS except as follows:

Equipment Blank ID	Analyte	Conc. (ng/L)	LOQ (ng/L)
BRLTN-053019-EB-DR	PFHxS	0.42	1.9
	PFHxA	0.56	1.9
	PFOSA	2.1	2.8
	PFOS	17	1.9

Equipment blank results were reported in parts per trillion and soil units were reported in parts per billion. Due to the magnitude of difference in results, the soil sample results were not impacted by the low-level equipment blank contamination.

One field blank was associated with the soil samples in this SDG. The field blank was non-detect for all target PFAS analytes.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All results for PFAS for the samples in this SDG were considered usable. Therefore, the completeness for the PFAS portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

METALS

General

The metals portion of this SDG consisted of three (3) environmental soil samples. The soil samples were collected on May 30, 2019. The samples were analyzed for select metals (Ca, Fe, Mn, and K) as specified in the project QAPP.

The metals analyses were performed in accordance with U.S. EPA Method SW6010C. All samples in this SDG were analyzed following the procedures outlined in the DoD QSM, version 5.1 and the project QAPP.

All samples were prepared and analyzed within the holding time required by the method. The samples were analyzed in one batch under one ICAL. All analyses were performed undiluted.

Accuracy

Accuracy was evaluated using the percent recovery obtained from the LCS and MS/MSD. Sample BRLTN-003-SO-7.0-7.5 was designated for MS/MSD analysis on the COC.

All LCS recoveries were within acceptance criteria.

All MS and MSD recoveries were within acceptance criteria except as follows.

Analyte	MS %R	MSD %R	Criteria
Calcium	153	159	81-116%
Iron	1302	6438	81-118%
Manganese	272	1379	84-114%

Calcium was qualified "J" as estimated with a potential high bias in the parent sample BRLTN-003-SO-7.0-7.5. The parent sample concentration was greater than 4 times the spike amount for iron and manganese, resulting in the anomalous recoveries. Therefore, data quality was not affected, and no corrective action was necessary.

Precision

Precision was evaluated using the RPD obtained from the MS/MSD analyte results.

All MS/MSD RPDs were within acceptance criteria except as follows.

Analyte	RPD	Criteria
Iron	30	RPD ≤ 20
Manganese	65	

The parent sample results for iron and manganese were qualified "J" as estimated due to the variability demonstrated by the MS/MSD pair.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the DoD QSM and project QAPP;
- Comparing actual analytical procedures to those described in the DoD QSM and project QAPP;
- Evaluating holding times; and
- Examining field and laboratory blanks for cross contamination of samples during collection and analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the DoD QSM and project QAPP. All samples were prepared and analyzed within the holding time required by the method. The following QC elements were also evaluated:

- All instrument tune criteria were met.
- All initial calibration criteria were met.
- The ICV was prepared from a second source standard. All ICV criteria were met.
- All CCV criteria were met.

- All initial calibration blank (ICB) and continuing calibration blank (CCB) criteria were met except as follows. One or more ICB and CCB had detections for calcium, Iron, and potassium at concentrations below the LOQ. However, the associated sample results were significantly greater than the LOQ. Therefore, sample results were not affected, and no corrective action was necessary.
- The serial dilution test (DT) was performed on the same sample as the MS/MSD (BRLTN-003-SO-7.0-7.5). The DT was only applicable to those metals detected in the parent sample at a concentration of 50 times the LOQ or greater. All applicable metals met criteria in the DT
- The post digestion spike (PDS) was performed on the same sample as the DT. The PDS met criteria for all target metals.

One laboratory method blank was associated with the metals in this SDG. The laboratory method blank was non-detect for all target metals.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All metals results for the samples in this SDG were considered usable. Therefore, the completeness for the metals portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

ANIONS

General

The anions portion of this SDG consisted of three (3) environmental soil samples. The samples were collected on May 30, 2019 and were analyzed for chloride and sulfate as specified in the project QAPP.

The anion analyses were performed in accordance with U.S. EPA Method SW9056A. All samples in this SDG were analyzed following the procedures outlined in the DoD QSM, version 5.1 and the project QAPP.

All samples were prepared and analyzed within the holding time required by the method. The samples were analyzed in one batch under a single ICAL. All analyses were performed undiluted.

Accuracy

Accuracy was evaluated using the percent recovery obtained from the LCS and MS. Sample BRLTN-003-SO-7.0-7.5 was designated for MS/MSD analysis on the COC. The laboratory analyzed an MS and a lab duplicate in lieu of the MS/MSD pair. All LCS recoveries were within acceptance criteria.

All MS recoveries were within acceptance criteria except as follows.

Analyte	MS %R	Criteria
Chloride	84	87-115%

Chloride was detected in the parent sample at a concentration below the LOQ and thus was already qualified "J". The chloride result in the parent sample (BRLTN-003-SO-7.0-7.5) may potentially be biased low.

Precision

Precision was evaluated using the RPD obtained from the laboratory duplicate results. The laboratory duplicate was analyzed on the same sample as the MS.

The laboratory duplicate RPD was within acceptance criteria.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the DoD QSM and project QAPP;
- Comparing actual analytical procedures to those described in the DoD QSM and project QAPP;
- Evaluating holding times; and
- Examining field and laboratory blanks for cross contamination of samples during collection and analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the DoD QSM and project QAPP. All samples were prepared and analyzed within the holding time required by the method. The following QC elements were also evaluated:

- All initial calibration criteria were met.
- The ICV was prepared from a second source standard. All ICV criteria were met.
- All CCV criteria were met.

One laboratory method blank was associated with the anion analyses in this SDG. The laboratory method blank was non-detect for the target anions.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All anion results for the samples in this SDG were considered usable. Therefore, the completeness for the anions portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

TOC

General

The TOC portion of this SDG consisted of three (3) environmental soil samples. The samples were collected on May 30, 2019 and were analyzed for TOC as specified in the project QAPP.

The TOC analyses were performed in accordance with U.S. EPA Method SW9060A. All samples in this SDG were analyzed following the procedures outlined in the DoD QSM, version 5.1 and the project QAPP.

All samples were prepared and analyzed within the holding time required by the method. The samples were analyzed in one batch under a single ICAL. All analyses were performed undiluted.

Accuracy

Accuracy was evaluated using the percent recovery obtained from the LCS, and MS/MSD. Sample BRLTN-003-SO-7.0-7.5 was designated for MS/MSD analysis on the COC. The laboratory analyzed an MS and a lab duplicate in lieu of the MS/MSD pair.

All LCS and MS recoveries were within acceptance criteria.

Precision

Precision was evaluated using the RPD obtained from the laboratory duplicate results. The laboratory duplicate was analyzed on the same sample as the MS.

The laboratory duplicate was outside laboratory acceptance criteria as follows.

Analyte	RPD	Criteria
TOC	17	RPD ≤ 7

The parent sample result for TOC was qualified "J" as estimated due to the variability demonstrated by the laboratory analytical duplicate.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the DoD QSM and project QAPP;
- Comparing actual analytical procedures to those described in the DoD QSM and project QAPP;
- Evaluating holding times; and
- Examining field and laboratory blanks for cross contamination of samples during collection and analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the DoD QSM and project QAPP. All samples were prepared and analyzed within the holding time required by the method. The following QC elements were also evaluated:

- All initial calibration criteria were met.
- All ICV criteria were met.
- All CCV criteria were met.
- All ICB and CCB criteria were met.

One laboratory method blank was associated with the TOC analyses in this SDG. The laboratory method blank was non-detect for TOC.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All TOC results for the samples in this SDG were considered usable. Therefore, the completeness for the TOC portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

pH

The pH portion of this SDG consisted of four (4) environmental soil samples. The samples were collected on May 30, 2019 and were analyzed for pH as specified in the project QAPP.

The pH analyses were performed in accordance with U.S. EPA Method SW9045D. The samples were analyzed on 6/11/19. All samples were analyzed outside the method required holding time. Therefore, all pH results were qualified "J" as estimated.

Accuracy

Accuracy was evaluated using the percent recovery obtained from the LCS.

The LCS recovery was within acceptance criteria.

Precision

Precision was evaluated using the RPD obtained from the laboratory duplicate results. The laboratory duplicate was analyzed on sample BRLTN-003-SO-5.0-5.5.

The laboratory duplicate RPD met criteria.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the DoD QSM and project QAPP;
- Comparing actual analytical procedures to those described in the DoD QSM and project QAPP; and
- Evaluating holding times.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the DoD QSM and project QAPP. All samples were analyzed outside the holding time required by the method, as previously noted. All pH results were qualified "J" as estimated due to the holding time exceedance. The following QC elements were also evaluated:

- The pH meter was calibrated prior to sample analysis.
- All CCV criteria were met.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All pH results for the samples in this SDG were considered usable. Therefore, the completeness for the pH portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

COMPARABILITY

All data was generated using contract-specific standard methods and reported with known data quality, type of analysis, units, etc.

SENSITIVITY

The LOD and LOQ values reported for the samples were compared to those listed in the QAPP to ensure that sensitivity requirements were met. Sample LODs and LOQs were adjusted based on dilution and/or initial/final volumes.

The LOD and LOQ values were below the project action limit (PAL) listed in the QAPP for all target PFAS.

DATA USABILITY

The purpose of this data validation report is to ensure the integrity and reliability of analytical laboratory data. The data quality is evaluated based on precision, accuracy, representativeness, comparability, and completeness (PARCC) characteristics of the data. None of the results were qualified as rejected. Minor QC exceedances where data was qualified as estimated and flagged "J" are considered usable for the purposes of this project.

DATA QUALIFIER CHANGES

The following data qualifiers were added, removed, or changed as a result of the data validation process:

Sample ID	Analyte	Units	Original Result	Final Result	Reason Code
BRLTN-003-SO-5.0-5.5	NMeFOSAA	ng/g	2.1 U	2.1 UJ	I12
BRLTN-093-SO-5.0-5.5	NMeFOSAA	ng/g	1.9 U	1.9 UJ	I12
BRLTN-003-SO-7.0-7.5	NMeFOSAA	ng/g	2.0 U	2.0 UJ	I12
BRLTN-003-SO-5.0-5.5	NEtFOSAA	ng/g	2.1 U	2.1 UJ	I12
BRLTN-093-SO-5.0-5.5	NEtFOSAA	ng/g	1.9 U	1.9 UJ	I12
BRLTN-003-SO-7.0-7.5	NEtFOSAA	ng/g	2.0 U	2.0 UJ	I12
BRLTN-003-SO-5.0-5.5	PFOS	ng/g	110 B	110 J	L2
BRLTN-093-SO-5.0-5.5	PFOS	ng/g	160 B	160 J	L2
BRLTN-003-SO-7.0-7.5	PFOS	ng/g	13 B	13 J	L2
BRLTN-004-SO-6.0-6.5	PFOS	ng/g	17 B	17 J	L2

Sample ID	Analyte	Units	Original Result	Final Result	Reason Code
BRLTN-003-SO-7.0-7.5	Calcium	mg/kg	756	756 J	M2
BRLTN-003-SO-7.0-7.5	Chloride	mg/kg	6.05 J	6.05 J	M3
BRLTN-003-SO-7.0-7.5	TOC	mg/kg	472	472 J	M4
BRLTN-003-SO-5.0-5.5	pH	pH	7.38	7.38 J	H1
BRLTN-003-SO-7.0-7.5	pH	pH	6.56	6.56 J	H1
BRLTN-004-SO-5.0-5.5	pH	pH	7.81	7.81 J	H1
BRLTN-004-SO-6.0-6.5	pH	pH	7.14	7.14 J	H1
BRLTN-003-SO-7.0-7.5	Iron	mg/kg	11,500	11,500 J	M4
BRLTN-003-SO-7.0-7.5	Manganese	mg/kg	374	374 J	M4

DATA QUALIFIER DEFINITIONS

The data qualifiers are defined in Table 36.2 of the project-specific UFP-QAPP, as follows:

R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified. The data is unusable.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected. However, the reported LOD is approximate and may or may not accurately and precisely represent the concentration necessary to detect the analyte in the sample.
U	Analyte was not detected and is reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.

REASON CODE DEFINITIONS

Reason codes were used to document the logic behind all data validation qualifiers. The following reason codes for data qualification were associated with the samples in this SDG:

I12: EIS percent recovery infraction with no assignable bias

L2: LCS percent recovery Infraction with High Bias

M2: MS/MSD percent recovery Infraction with High Bias

M3: MS/MSD percent recovery Infraction with Low Bias

M4: MS/MSD or Duplicate Precision Infraction

H1: Holding Time Infraction, Sampling to Analysis

DATA VALIDATION SUMMARY REPORT

for samples collected from

BURLINGTON AIR NATIONAL GUARD BASE

SOUTH BURLINGTON, VERMONT

Data Validation by: Beth Driskill

Report Date: August 23, 2019

Parsons - Austin

INTRODUCTION

The following data validation summary report covers two (2) water samples and one (1) field blank (FB). The samples were collected from Burlington Air National Guard (ANG) Base in South Burlington, Vermont on June 2, 2019. The samples were logged under the following Sample Delivery Group (SDG):

2046873

The samples in this SDG were analyzed for per- and polyfluoroalkyl substances (PFAS) by U.S. EPA Method 537 modified. The following table details the samples included in this SDG and the analytical parameters performed. The field quality control (QC) samples collected in association with this SDG included one FB sample. No equipment blank was associated to the samples in this SDG because the samples were collected from established wells with dedicated sampling equipment.

All samples were collected by Parsons and were hand delivered on ice to Eurofins TestAmerica (TA) in South Burlington, Vermont in one cooler on June 3, 2019. TA-Burlington then shipped the samples to Eurofins Lancaster Laboratories Environmental (ELLE). The planning documents for this site originally indicated the samples would be analyzed by TestAmerica in Sacramento, California (TA-Sacramento). However, upon initiation of the project, TA-Sacramento did not have sufficient capacity to meet the requirements of the project and therefore, the work was transferred to ELLE. ELLE performed all analyses related to this project. The samples were received by ELLE in good condition and the at an acceptable temperature of 1.1 degrees Celsius. However, Parsons project chemist did request that the laboratory remove the "BRLTN02" included in the sample ID.

All samples were prepared and analyzed following the procedures outlined in the project-specific Uniform Federal Policy - Quality Assurance Project Plan (UFP-QAPP) and the Department of Defense (DoD) Quality Systems Manual (QSM) Version 5.1.

SAMPLE IDs AND REQUESTED PARAMETERS

Sample ID	Matrix	COMMENTS
MW-405-01	Water	
MW-401-01	Water	

Sample ID	Matrix	COMMENTS
BRLTN-060219-FB	Water	Field blank

Note: All samples listed above were analyzed for the PFAS method listed in the table below.

EXTRACTION, ANALYTICAL, AND REPORTING DETAILS

Parameter	Matrix	Prep Method	Analytical Method	Units
PFAS	Water	EPA 537 Modified*	EPA 537 Modified	ng/l

ng/l = nanogram per liter

*PFAS by LC/MS/MS compliant with QSM 5.1 Table B-15

EVALUATION CRITERIA

The Level IV data package submitted by the laboratory has been reviewed and verified following the guidelines outlined in the project-specific UFP-QAPP and DoD QSM 5.1. Data qualification was performed following the spirit of the National Functional Guidelines for Organic Data Review even though this document does not specifically include the method for PFAS.

Information reviewed in the data packages included sample results; field and laboratory quality control results; instrument calibration; calibration verifications; case narratives; sample receipt forms, and chain-of-custody (COC) forms. The analyses and findings presented in this report are based on the reviewed information, and whether guidelines in the associated analytical method, DoD QSM and QAPP were met. It should be noted that the final approved QAPP for this project indicated TestAmerica Sacramento was the primary laboratory. However, due to capacity issues with the laboratory, all samples were sent to and analyzed by, ELLE. Therefore, the accuracy tolerances reported in the data packages do not match those listed in the project QAPP. Per the DOD QSM 5.1, statistically derived in-house tolerances should be used for PFAS analysis. As these tolerances differ between laboratories, the limits listed in the analytical reports from ELLE were used to evaluate accuracy.

External Injection Standard (EIS) responses were only used to qualify data when the recovery was excessively high or excessively low. Data associated with EIS recoveries below 10% or above 190% were rejected. Data associated with EIS recoveries below 20% but at or above 10%, or above 180% but at or below 190%, were qualified “J” as estimated. At these extremes, the associated sample data were considered impacted and estimated, or significantly impacted and rejected. Data associated with EIS recoveries between 20% and 180% were not considered significantly impacted and no data qualifiers were applied for EIS recoveries within this range.

A table detailing the data qualifiers applied, removed, or changed for the samples in this SDG as a result of the data validation process is included at the end of this report.

PFAS

General

The PFAS portion of this SDG consisted of three (3) samples, including two (2) environmental water samples and one (1) FB. The samples were collected on June 2, 2019 and were analyzed for the following target list of 24 PFAS analytes as specified in the project-specific UFP-QAPP.

Analyte	CAS Number
Perfluorobutanoic acid (PFBA)	375-22-4
Perfluoropentanoic acid (PFPeA)	2706-90-3
Perfluorohexanoic acid (PFHxA)	307-24-4
Perfluoroheptanoic acid (PFHpA)	375-85-9
Perfluorooctanoic acid (PFOA)	335-67-1
Perfluorononanoic acid (PFNA)	375-95-1
Perfluorodecanoic acid (PFDA)	335-76-2
Perfluoroundecanoic acid (PFUnA)	2058-94-8
Perfluorododecanoic acid (PFDoA)	307-55-1
Perfluorotridecanoic Acid (PFTriA)	72629-94-8
Perfluorotetradecanoic acid (PFTeA)	376-06-7
Perfluorobutanesulfonic acid (PFBS)	375-73-5
Perfluorohexanesulfonic acid (PFHxS)	355-46-4
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8
Perfluorooctanesulfonic acid (PFOS)	1763-23-1
Perfluorodecanesulfonic acid (PFDS)	335-77-3
Perfluorooctane Sulfonamide (PFOSA)	754-91-6
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	2991-50-6
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	2355-31-9
1H,1H,2H,2H-perfluorooctane sulfonate (6:2 FTS)	27619-97-2
1H,1H,2H,2H-perfluorodecane sulfonate (8:2 FTS)	39108-34-4
1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2 FTS)	757124-72-4
Perflouro-1-nonanesulfonate (PFNS)	68259-12-1
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4

The PFAS analyses were performed in accordance with U.S. EPA Method 537 Modified (PFAS by LC/MS/MS Compliant with QSM 5.1 Table B-15). All samples in this SDG were analyzed following the procedures outlined in the DoD QSM, version 5.1 and the project-specific UFP-QAPP with exception of the previously noted accuracy tolerances.

The samples were prepared and analyzed within the holding time required by the method. The samples were prepared and analyzed in one batch. The samples were analyzed on one instrument under one initial calibration (ICAL). Some of the samples were reanalyzed due to QC related deficiencies. The laboratory reported the most compliant run for each sample. Only the final reported analyses and the associated QC are discussed in this report.

Accuracy

Accuracy was evaluated using the percent recovery (%R) obtained from the laboratory control sample (LCS), the Extracted Internal Standard (EIS) analytes (also referred to as surrogates in the laboratory report), and Injection Internal Standards (IIS) analytes.

All LCS recoveries were within acceptance criteria.

All injection IIS analytes were within acceptance criteria.

All EIS analytes were within acceptance criteria except as follows:

Sample ID	Dilution	EIS	%R	Criteria
MW-405-01	1x	13C2-4:2-FTS	315	20-180%
MW-405-01	1x	13C2-6:2-FTS	232	
MW-405-01	1x	13C8-PFOSA	18	
MW-401-01	1x	13C2-4:2-FTS	427	

The results associated with the non-compliant EIS above 190% were qualified as rejected and flagged "R". The results associated with the non-compliant EIS below 20% but above 10% was qualified as estimated and flagged "UJ".

Precision

Precision could not be evaluated for this SDG as no duplicate analyses were performed.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the DoD QSM and project-specific UFP-QAPP;
- Comparing actual analytical procedures to those described in the DoD QSM and project-specific UFP-QAPP;
- Evaluating holding times; and
- Examining field and laboratory blanks for cross contamination of samples during collection and analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the DoD QSM and project-specific UFP-QAPP. All samples were prepared and analyzed within the holding time required by the method. The following QC elements were also evaluated:

- All (ICAL) criteria were met.

- All initial calibration verification (ICV) criteria were met.
- All continuing calibration verification (CCV) criteria were met.
- All instrument sensitivity check (ISC) criteria were met.
- Raw data was spot-checked for qualitative and quantitative accuracy.
- Calculations were spot-checked and verified.

One laboratory method blank was associated with the PFAS analyses in this SDG. The laboratory method blank was non-detect for all target PFAS analytes.

One field blank was associated to the soil samples in this SDG. The field blank was non-detect for all target PFAS analytes.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

Three results for PFAS for the samples in this SDG were qualified as rejected and flagged "R". Therefore, the completeness for the PFAS portion of this SDG is 94%, which meets the minimum acceptance criteria of 90%.

COMPARABILITY

All data was generated using contract-specific standard methods and reported with known data quality, type of analysis, units, etc.

SENSITIVITY

The LOD and LOQ values reported for the samples were compared to those listed in the QAPP to ensure that sensitivity requirements were met. Sample LODs and LOQs were adjusted based on dilution and/or initial/final volumes.

The LOD and LOQ values were below the project action limit (PAL) listed in the QAPP for all target PFAS.

DATA USABILITY

The purpose of this data validation report is to ensure the integrity and reliability of analytical laboratory data. The data quality is evaluated based on precision, accuracy, representativeness, comparability, and completeness (PARCC) characteristics of the data. Three PFAS results were qualified as rejected due to extreme exceedances in the associated EIS which causes those results to be unusable. Minor QC exceedances where data was qualified as estimated and flagged "J" are considered usable for the purposes of this project.

DATA QUALIFIER CHANGES

The following data qualifiers were added, removed, or changed as a result of the data validation process:

Sample ID	Analyte	Units	Original Result	Final Result	Reason Code
MW-405-01	4:2-FTS	ng/l	1.8 U	1.8 R	I12
MW-405-01	6:2-FTS	ng/l	8.2	8.2 R	I12
MW-401-01	4:2-FTS	ng/l	2.2 J	2.2 R	I12
MW-405-01	PFOSA	ng/l	2.7 U	2.7 UJ	I12

DATA QUALIFIER DEFINITIONS

The data qualifiers are defined in Table 36.2 of the project-specific UFP-QAPP, as follows:

R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified. The data is unusable.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected. However, the reported LOD is approximate and may or may not accurately and precisely represent the concentration necessary to detect the analyte in the sample.
U	Analyte was not detected and is reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.

REASON CODE DEFINITIONS

Reason codes were used to document the logic behind all data validation qualifiers. The following reason codes for data qualification were associated with the samples in this SDG:

I12: EIS percent recovery infraction with no assignable bias

DATA VALIDATION SUMMARY REPORT

for samples collected from

BURLINGTON AIR NATIONAL GUARD BASE

SOUTH BURLINGTON, VERMONT

Data Validation by: Beth Driskill

Report Date: September 19, 2019

Parsons - Austin

INTRODUCTION

The following data validation summary report covers three (3) water samples and one (1) field blank (FB). The samples were collected from Burlington Air National Guard (ANG) Base in South Burlington, Vermont on June 3, 2019. The samples were logged under the following Sample Delivery Group (SDG):

2047041

The samples in this SDG were analyzed for per- and polyfluoroalkyl substances (PFAS) by U.S. EPA Method 537 modified. The following table details the samples included in this SDG and the analytical parameters performed. The field quality control (QC) samples collected in association with this SDG included one (1) MS/MSD set and one (1) FB sample. No equipment blank was associated to the samples in this SDG because the samples were collected from established wells with dedicated sampling equipment.

All samples were collected by Parsons and were hand delivered on ice to Eurofins TestAmerica (TA) in South Burlington, Vermont in one cooler on June 3, 2019. TA-Burlington then shipped the samples to Eurofins Lancaster Laboratories Environmental (ELLE). The planning documents for this site originally indicated the samples would be analyzed by TestAmerica in Sacramento, California (TA-Sacramento). However, upon initiation of the project, TA-Sacramento did not have sufficient capacity to meet the requirements of the project and therefore, the work was transferred to ELLE. ELLE performed all analyses related to this project. The samples were received by ELLE in good condition and at an acceptable temperature of 1.8 degrees Celsius.

All samples were prepared and analyzed following the procedures outlined in the project-specific Uniform Federal Policy - Quality Assurance Project Plan (UFP-QAPP) and the Department of Defense (DoD) Quality Systems Manual (QSM) Version 5.1.

SAMPLE IDs AND REQUESTED PARAMETERS

Sample ID	Matrix	COMMENTS
V4-MW413-01	Water	MS/MSD
V1-MW14-01	Water	
V1-MW-107-01	Water	

Sample ID	Matrix	COMMENTS
BRLTN-060319-FB	Water	Field blank

Note: All samples listed above were analyzed for the PFAS method listed in the table below.

EXTRACTION, ANALYTICAL, AND REPORTING DETAILS

Parameter	Matrix	Prep Method	Analytical Method	Units
PFAS	Water	EPA 537 Modified*	EPA 537 Modified	ng/l

ng/l = nanogram per liter

*PFAS by LC/MS/MS compliant with QSM 5.1 Table B-15

EVALUATION CRITERIA

The Level IV data package submitted by the laboratory has been reviewed and verified following the guidelines outlined in the project-specific UFP-QAPP and DoD QSM 5.1. Data qualification was performed following the spirit of the National Functional Guidelines for Organic Data Review even though this document does not specifically include the method for PFAS.

Information reviewed in the data packages included sample results; field and laboratory quality control results; instrument calibration; calibration verifications; case narratives; sample receipt forms, and chain-of-custody (COC) forms. The analyses and findings presented in this report are based on the reviewed information, and whether guidelines in the associated analytical method, DoD QSM and QAPP were met. It should be noted that the final approved QAPP for this project indicated TestAmerica Sacramento was the primary laboratory. However, due to capacity issues with the laboratory, all samples were sent to and analyzed by, ELLE. Therefore, the accuracy tolerances reported in the data packages do not match those listed in the project QAPP. Per the DOD QSM 5.1, statistically derived in-house tolerances should be used for PFAS analysis. As these tolerances differ between laboratories, the limits listed in the analytical reports from ELLE were used to evaluate accuracy.

External Injection Standard (EIS) responses were only used to qualify data when the recovery was excessively high or excessively low. Data associated with EIS recoveries below 10% or above 190% were rejected. Data associated with EIS recoveries below 20% but at or above 10%, or above 180% but at or below 190%, were qualified “J” as estimated. At these extremes, the associated sample data were considered impacted and estimated, or significantly impacted and rejected. Data associated with EIS recoveries between 20% and 180% were not considered significantly impacted and no data qualifiers were applied for EIS recoveries within this range.

A table detailing the data qualifiers applied, removed, or changed for the samples in this SDG as a result of the data validation process is included at the end of this report.

PFAS

General

The PFAS portion of this SDG consisted of four (4) samples, including three (3) environmental water samples and one (1) FB. The samples were collected on June 3, 2019 and were analyzed for the following target list of 24 PFAS analytes as specified in the project-specific UFP-QAPP.

Analyte	CAS Number
Perfluorobutanoic acid (PFBA)	375-22-4
Perfluoropentanoic acid (PFPeA)	2706-90-3
Perfluorohexanoic acid (PFHxA)	307-24-4
Perfluoroheptanoic acid (PFHpA)	375-85-9
Perfluorooctanoic acid (PFOA)	335-67-1
Perfluorononanoic acid (PFNA)	375-95-1
Perfluorodecanoic acid (PFDA)	335-76-2
Perfluoroundecanoic acid (PFUnA)	2058-94-8
Perfluorododecanoic acid (PFDoA)	307-55-1
Perfluorotridecanoic Acid (PFTriA)	72629-94-8
Perfluorotetradecanoic acid (PFTeA)	376-06-7
Perfluorobutanesulfonic acid (PFBS)	375-73-5
Perfluorohexanesulfonic acid (PFHxS)	355-46-4
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8
Perfluorooctanesulfonic acid (PFOS)	1763-23-1
Perfluorodecanesulfonic acid (PFDS)	335-77-3
Perfluorooctane Sulfonamide (PFOSA)	754-91-6
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	2991-50-6
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	2355-31-9
1H,1H,2H,2H-perfluorooctane sulfonate (6:2 FTS)	27619-97-2
1H,1H,2H,2H-perfluorodecane sulfonate (8:2 FTS)	39108-34-4
1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2 FTS)	757124-72-4
Perflouro-1-nonanesulfonate (PFNS)	68259-12-1
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4

The PFAS analyses were performed in accordance with U.S. EPA Method 537 Modified (PFAS by LC/MS/MS Compliant with QSM 5.1 Table B-15). All samples in this SDG were analyzed following the procedures outlined in the DoD QSM, version 5.1.1 and the project-specific UFP-QAPP with exception of the previously noted accuracy tolerances.

The samples were prepared and analyzed within the holding time required by the method. The samples were prepared and analyzed in one batch. The samples were analyzed on one instrument under one initial calibration (ICAL). Some of the samples were reanalyzed due to QC related deficiencies. The laboratory reported the most compliant run for each sample. Only the final reported analyses and the associated QC are discussed in this report.

Accuracy

Accuracy was evaluated using the percent recovery (%R) obtained from the laboratory control sample (LCS), matrix spike/matrix spike duplicate (MS/MSD), the Extracted Internal Standard (EIS) analytes (also referred to as surrogates in the laboratory report), and Injection Internal Standard (IIS) analytes. Sample V4-MW413-01 was designated on the COC for MS/MSD analysis.

All LCS recoveries were within acceptance criteria.

All MS and MSD recoveries were within acceptance criteria except as follows.

Analyte	MS %R	MSD %R	Criteria
PFPeA	158	151	75-138%
PFPeS	79	50	82-132%
PFHpA	65	64	80-140%
PFHxS	34	14	71-131%
PFOS	273	136	54-139%

The parent sample concentrations for the analytes listed above were significantly greater than (more than 4 times) the amount spiked, resulting in the anomalous recoveries. Therefore, no corrective action was necessary, and no data was qualified.

All IIS recoveries were within acceptance criteria except as follows.

IIS	Sample ID	%R	Criteria
13C3-PFBA	V1-MW14-01	49	50-150%

Qualification of the data is not necessary since IIS recovery only impacts EIS response.

All EIS analytes were within acceptance criteria except as follows:

Sample ID	Dilution	Extracted Internal Standard	%R	Criteria
V1-MW14-01	1x	13C2-4:2-FTS	351	20-180%
V1-MW-107-01	1x	13C2-4:2-FTS	202	
BRLTN-060319-FB	1x	13C2-PFDoDA	6	
BRLTN-060319-FB	1x	13C2-PFTeDA	1	
BRLTN-060319-FB	1x	13C7-PFUnDA	18	
BRLTN-060319-FB	1x	D5-NEtFOSAA	17	

The results for the native target compounds PFUnDA and NEtFOSAA in sample BRLTN-060319-FB were non-detect and qualified “UJ” as estimated. All other native target compounds associated with the non-compliant EIS recoveries noted above were qualified “R” as rejected in the applicable samples due to the very high or very low EIS recoveries.

Precision

Precision was evaluated using the RPD obtained from the MS/MSD analyte results.

All MS/MSD RPDs were within acceptance criteria.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the DoD QSM and project-specific UFP-QAPP;
- Comparing actual analytical procedures to those described in the DoD QSM and project-specific UFP-QAPP;
- Evaluating holding times; and
- Examining field and laboratory blanks for cross contamination of samples during collection and analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the DoD QSM and project-specific UFP-QAPP. All samples were prepared and analyzed within the holding time required by the method. The following QC elements were also evaluated:

- All ICAL criteria were met.
- All initial calibration verification (ICV) criteria were met.
- All continuing calibration verification (CCV) criteria were met.
- All instrument sensitivity check (ISC) criteria were met.
- Raw data was reviewed for qualitative and quantitative accuracy.
- Calculations were spot-checked and verified.

One laboratory method blank was associated with the PFAS analyses in this SDG. The laboratory method blank was non-detect for all target PFAS analytes.

One field blank was associated with the samples in this SDG. The field blank was non-detect for all target PFAS analytes.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

Five results for PFAS for the samples in this SDG were qualified as rejected and flagged "R". Therefore, the completeness for the PFAS portion of this SDG is 93%, which meets the minimum acceptance criteria of 90%.

COMPARABILITY

All data was generated using contract-specific standard methods and reported with known data quality, type of analysis, units, etc.

SENSITIVITY

The LOD and LOQ values reported for the samples were compared to those listed in the QAPP to ensure that sensitivity requirements were met. Sample LODs and LOQs were adjusted based on dilution and/or initial/final volumes.

The LOD and LOQ values were below the project action limit (PAL) listed in the QAPP for all target PFAS.

DATA USABILITY

The purpose of this data validation report is to ensure the integrity and reliability of analytical laboratory data. The data quality is evaluated based on precision, accuracy, representativeness, comparability, and completeness (PARCC) characteristics of the data. Two PFAS results were qualified as rejected due to extreme exceedances in the associated EIS which causes those results to be unusable. All other data is considered usable for the purposes of this project.

DATA QUALIFIER CHANGES

The following data qualifiers were added, removed, or changed as a result of the data validation process:

Sample ID	Analyte	Units	Original Result	Final Result	Reason Code
V1-MW14-01	4:2-FTS	ng/l	1.9 U	1.9 R	I12
V1-MW-107-01	4:2-FTS	ng/l	1.8 U	1.8 R	I12
BRLTN-060319-FB	PFDoA	ng/l	1.0 U	1.0 R	I12
BRLTN-060319-FB	PFTriA	ng/l	1.0 U	1.0 R	I12
BRLTN-060319-FB	PFTeA	ng/l	1.0 U	1.0 R	I12
BRLTN-060319-FB	PFUnA	ng/l	1.0 U	1.0 UJ	I12
BRLTN-060319-FB	NEtFOSAA	ng/l	2.0 U	2.0 UJ	I12

DATA QUALIFIER DEFINITIONS

The data qualifiers are defined in Table 36.2 of the project-specific UFP-QAPP, as follows:

R — The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified. The data is unusable.

J — The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

UJ	The analyte was not detected. However, the reported LOD is approximate and may or may not accurately and precisely represent the concentration necessary to detect the analyte in the sample.
U	Analyte was not detected and is reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.

REASON CODE DEFINITIONS

Reason codes were used to document the logic behind all data validation qualifiers. The following reason codes for data qualification were associated with the samples in this SDG:

I12: EIS percent recovery infraction with no assignable bias

DATA VALIDATION SUMMARY REPORT

for samples collected from

BURLINGTON AIR NATIONAL GUARD BASE

SOUTH BURLINGTON, VERMONT

Data Validation by: Beth Driskill

Report Date: September 19, 2019

Parsons - Austin

INTRODUCTION

The following data validation summary report covers (2) water samples and one (1) field blank (FB). An investigation-derived waste (IDW) sample was also submitted with these samples but was not discussed in this DVR as it was only applicable to waste characterization. The samples were collected from Burlington Air National Guard (ANG) Base in South Burlington, Vermont on June 4, 2019. The samples were logged under the following Sample Delivery Group (SDG):

2047144

The samples in this SDG were analyzed for per- and polyfluoroalkyl substances (PFAS) by U.S. EPA Method 537 modified. The following table details the samples included in this SDG and the analytical parameters performed. The field quality control (QC) samples collected in association with this SDG included one (1) field duplicate (FD) and one (1) FB sample. No equipment blank was associated with the samples in this SDG because the samples were collected from established wells with dedicated sampling equipment.

All samples were collected by Parsons and were hand delivered on ice to Eurofins TestAmerica (TA) in South Burlington, Vermont in one cooler on June 4, 2019. TA-Burlington then shipped the samples to Eurofins Lancaster Laboratories Environmental (ELLE). The planning documents for this site originally indicated the samples would be analyzed by TestAmerica in Sacramento, California (TA-Sacramento). However, upon initiation of the project, TA-Sacramento did not have sufficient capacity to meet the requirements of the project and therefore, the work was transferred to ELLE. ELLE performed all analyses related to this project. The samples were received by ELLE in good condition and at an acceptable temperature of 1.5 degrees Celsius. However, sample MW-105-01 listed on the COC was cancelled and recollected on June 10, 2019. This sample is included in SDG 2048448.

All samples were prepared and analyzed following the procedures outlined in the project-specific Uniform Federal Policy - Quality Assurance Project Plan (UFP-QAPP) and the Department of Defense (DoD) Quality Systems Manual (QSM) Version 5.1.

SAMPLE IDs AND REQUESTED PARAMETERS

Sample ID	Matrix	COMMENTS
BRLTN-060419-FB	Water	Field blank
MW-403-01	Water	
MW-403-91	Water	FD of MW-403-01

Note: All samples listed above were analyzed for the PFAS method listed in the table below.

EXTRACTION, ANALYTICAL, AND REPORTING DETAILS

Parameter	Matrix	Prep Method	Analytical Method	Units
PFAS	Water	EPA 537 Modified*	EPA 537 Modified	ng/l

ng/l = nanogram per liter

*PFAS by LC/MS/MS compliant with QSM 5.1 Table B-15

EVALUATION CRITERIA

The Level IV data package submitted by the laboratory has been reviewed and verified following the guidelines outlined in the project-specific UFP-QAPP and DoD QSM 5.1. Data qualification was performed following the spirit of the National Functional Guidelines for Organic Data Review even though this document does not specifically include the method for PFAS.

Information reviewed in the data packages included sample results; field and laboratory quality control results; instrument calibration; calibration verifications; case narratives; sample receipt forms, and chain-of-custody (COC) forms. The analyses and findings presented in this report are based on the reviewed information, and whether guidelines in the associated analytical method, DoD QSM and QAPP were met. It should be noted that the final approved QAPP for this project indicated TestAmerica Sacramento was the primary laboratory. However, due to capacity issues with the laboratory, all samples were sent to and analyzed by, ELLE. Therefore, the accuracy tolerances reported in the data packages do not match those listed in the project QAPP. Per the DOD QSM 5.1, statistically derived in-house tolerances should be used for PFAS analysis. As these tolerances differ between laboratories, the limits listed in the analytical reports from ELLE were used to evaluate accuracy.

External Injection Standard (EIS) responses were only used to qualify data when the recovery was excessively high or excessively low. Data associated with EIS recoveries below 10% or above 190% were rejected. Data associated with EIS recoveries below 20% but at or above 10%, or above 180% but at or below 190%, were qualified “J” as estimated. At these extremes, the associated sample data were considered impacted and estimated, or significantly impacted and rejected. Data associated with EIS recoveries between 20% and 180% were not considered significantly impacted and no data qualifiers were applied for EIS recoveries within this range.

A table detailing the data qualifiers applied, removed, or changed for the samples in this SDG as a result of the data validation process is included at the end of this report.

PFAS

General

The PFAS portion of this SDG consisted of three (3) samples, including two (2) environmental water samples and one (1) FB. The samples were collected on June 4, 2019 and were analyzed for the following target list of 24 PFAS analytes as specified in the project-specific UFP-QAPP.

Analyte	CAS Number
Perfluorobutanoic acid (PFBA)	375-22-4
Perfluoropentanoic acid (PFPeA)	2706-90-3
Perfluorohexanoic acid (PFHxA)	307-24-4
Perfluoroheptanoic acid (PFHpA)	375-85-9
Perfluorooctanoic acid (PFOA)	335-67-1
Perfluorononanoic acid (PFNA)	375-95-1
Perfluorodecanoic acid (PFDA)	335-76-2
Perfluoroundecanoic acid (PFUnA)	2058-94-8
Perfluorododecanoic acid (PFDoA)	307-55-1
Perfluorotridecanoic Acid (PFTriA)	72629-94-8
Perfluorotetradecanoic acid (PFTeA)	376-06-7
Perfluorobutanesulfonic acid (PFBS)	375-73-5
Perfluorohexanesulfonic acid (PFHxS)	355-46-4
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8
Perfluorooctanesulfonic acid (PFOS)	1763-23-1
Perfluorodecanesulfonic acid (PFDS)	335-77-3
Perfluorooctane Sulfonamide (PFOSA)	754-91-6
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	2991-50-6
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	2355-31-9
1H,1H,2H,2H-perfluorooctane sulfonate (6:2 FTS)	27619-97-2
1H,1H,2H,2H-perfluorodecane sulfonate (8:2 FTS)	39108-34-4
1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2 FTS)	757124-72-4
Perflouro-1-nonanesulfonate (PFNS)	68259-12-1
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4

The PFAS analyses were performed in accordance with U.S. EPA Method 537 Modified (PFAS by LC/MS/MS Compliant with QSM 5.1 Table B-15). All samples in this SDG were analyzed following the procedures outlined in the DoD QSM, version 5.1.1 and the project-specific UFP-QAPP with exception of the previously noted accuracy tolerances.

The samples were prepared and analyzed within the holding time required by the method. The samples were prepared and analyzed in one batch. The samples were analyzed on one instrument under one initial calibration (ICAL). Some of the samples were reanalyzed due to QC related deficiencies. The laboratory reported the most compliant run for each sample. Only the final reported analyses and the associated QC are discussed in this report.

Accuracy

Accuracy was evaluated using the percent recovery (%R) obtained from the laboratory control sample (LCS), the Extracted Internal Standards (EIS) (also referred to as surrogates in the laboratory report), and the Injection Internal Standards (IIS).

All LCS recoveries were within acceptance criteria.

All IIS recoveries were within acceptance criteria except as follows.

IIS	Sample ID	%R	Criteria
13C4-PFOS	MW-403-01	42	50-150%
13C4-PFOS	MW-403-91	43	

Qualification of the data is not necessary since IIS recovery only impacts EIS response.

All EIS analytes were within acceptance criteria except as follows:

Sample ID	Dilution	EIS	%R	Criteria
MW-403-01	1x	13C2-4:2-FTS	268	20-180%
MW-403-91	1x	13C2-4:2-FTS	240	

The native compound results associated with the non-compliant EIS were qualified "R" as rejected due the excessively high recoveries.

Precision

Precision was evaluated using the RPD obtained from the FD analyte results.

All field duplicate RPDs were within acceptance criteria.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the DoD QSM and project-specific UFP-QAPP;
- Comparing actual analytical procedures to those described in the DoD QSM and project-specific UFP-QAPP;
- Evaluating holding times; and
- Examining field and laboratory blanks for cross contamination of samples during collection and analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the DoD QSM and project-specific UFP-QAPP. All samples were prepared

and analyzed within the holding time required by the method. The following QC elements were also evaluated:

- All ICAL criteria were met.
- All initial calibration verification (ICV) criteria were met.
- All continuing calibration verification (CCV) criteria were met.
- All instrument sensitivity check (ISC) criteria were met.
- Raw data was spot-checked for qualitative and quantitative accuracy.
- Calculations were spot-checked and verified.

One laboratory method blank was associated with the PFAS analyses in this SDG. The laboratory method blank was non-detect for all target PFAS analytes.

One field blank was associated to the soil samples in this SDG. The field blank was non-detect for all target PFAS analytes.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

Two results in this SDG were qualified as "R" rejected and were considered unusable. Therefore, the completeness for the PFAS portion of this SDG is 96%, which meets the minimum acceptance criteria of 90%.

COMPARABILITY

All data was generated using contract-specific standard methods and reported with known data quality, type of analysis, units, etc.

SENSITIVITY

The LOD and LOQ values reported for the samples were compared to those listed in the QAPP to ensure that sensitivity requirements were met. Sample LODs and LOQs were adjusted based on dilution and/or initial/final volumes.

The LOD and LOQ values were below the project action limit (PAL) listed in the QAPP for all target PFAS.

DATA USABILITY

The purpose of this data validation report is to ensure the integrity and reliability of analytical laboratory data. The data quality is evaluated based on precision, accuracy, representativeness, comparability, and completeness (PARCC) characteristics of the data. Two PFAS results for PFAS were qualified as rejected due to extreme exceedances in the associated EIS which causes those results to be unusable. All other data in this SDG is considered usable for the purposes of this project.

DATA QUALIFIER CHANGES

The following data qualifiers were added, removed, or changed as a result of the data validation process:

Sample ID	Analyte	Units	Original Result	Final Result	Reason Code
MW-403-01	4:2-FTS	ng/l	1.8 U	1.8 R	I12
MW-403-91	4:2-FTS	ng/l	1.8 U	1.8 R	I12

DATA QUALIFIER DEFINITIONS

The data qualifiers are defined in Table 36.2 of the project-specific UFP-QAPP, as follows:

R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified. The data is unusable.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected. However, the reported LOD is approximate and may or may not accurately and precisely represent the concentration necessary to detect the analyte in the sample.
U	Analyte was not detected and is reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.

REASON CODE DEFINITIONS

Reason codes were used to document the logic behind all data validation qualifiers. The following reason codes for data qualification were associated with the samples in this SDG:

I12: EIS percent recovery infraction with no assignable bias

DATA VALIDATION SUMMARY REPORT

for samples collected from

BURLINGTON AIR NATIONAL GUARD BASE

SOUTH BURLINGTON, VERMONT

Data Validation by: Beth Driskill

Report Date: September 19, 2019

Parsons - Austin

INTRODUCTION

The following data validation summary report covers five (5) sediment samples, five (5) water samples, one (1) equipment blank (EB), and one (1) field blank (FB). The samples were collected from Burlington Air National Guard (ANG) Base in South Burlington, Vermont on June 10, 2019. The samples were logged under the following Sample Delivery Group (SDG):

2048446

The samples in this SDG were analyzed for per- and polyfluoroalkyl substances (PFAS) by U.S. EPA Method 537 modified. The following table details the samples included in this SDG and the analytical parameters performed. The field quality control (QC) samples associated with the samples in this SDG include two field duplicates (FD), one EB, one FB, and one source blank (SB) sample. The SB was collected on May 21, 2019 and is reported in SDG 2045561. The EB and SB sample are only applicable to the sediment samples included in this SDG since they were collected with non-disposable equipment. Percent moisture was determined for all sediment samples.

All samples were collected by Parsons and were hand delivered on ice to Eurofins TestAmerica (TA) in South Burlington, Vermont in two coolers on June 11, 2019. TA-Burlington then shipped the samples to Eurofins Lancaster Laboratories Environmental (ELLE). The planning documents for this site originally indicated the samples would be analyzed by TestAmerica in Sacramento, California (TA-Sacramento). However, upon initiation of the project, TA-Sacramento did not have sufficient capacity to meet the requirements of the project and therefore, the work was transferred to ELLE. ELLE performed all analyses related to this project. The samples were received by ELLE in good condition and at an acceptable temperature of 3.3 and 0.9 degrees Celsius.

All samples were prepared and analyzed following the procedures outlined in the project-specific Uniform Federal Policy - Quality Assurance Project Plan (UFP-QAPP) and the Department of Defense (DoD) Quality Systems Manual (QSM) Version 5.1

SAMPLE IDs AND REQUESTED PARAMETERS

Sample ID	Matrix	COMMENTS
BRLTNDG-002-SD-0.0-0.5	Sediment	
BRLTNDG-014-SD-0.0-0.5	Sediment	
BRLTNDG-914-SD-0.0-0.5	Sediment	FD of BRLTNDG-014-SD-0.0-0.5
BRLTNDG-011-SD-0.0-0.5	Sediment	
BRLTNDG-012-SD-0.0-0.5	Sediment	
BRLTNDG-002-SW	Water	
BRLTNDG-014-SW	Water	
BRLTNDG-914-SW	Water	FD of BRLTNDG-014-SW
BRLTNDG-061019-FB	Water	Field blank
BRLTNDG-061019-EB	Water	Equipment blank
BRLTNDG-011-SW	Water	
BRLTNDG-012-SW	Water	

EXTRACTION, ANALYTICAL, AND REPORTING DETAILS

Parameter	Matrix	Prep Method	Analytical Method	Units
PFAS	Sediment	EPA 537 Modified	EPA 537 Modified*	ng/g
PFAS	Water	EPA 537 Modified	EPA 537 Modified*	ng/l

Note: PFAS units for soil in the QAPP are in ug/kg (ppb). Lab reported sediments in units of ng/g (ppb).

* PFAS by LC/MS/MS Compliant with QSM 5.1 Table B-15

EVALUATION CRITERIA

The Level IV data package submitted by the laboratory has been reviewed and verified following the guidelines outlined in the project-specific UFP-QAPP and DoD QSM 5.1. Data qualification was performed following the spirit of the National Functional Guidelines for Organic Data Review even though this document does not specifically include the method for PFAS.

Information reviewed in the data packages included sample results; field and laboratory quality control results; instrument calibration; calibration verifications; case narratives; sample receipt forms, and chain-of-custody (COC) forms. The analyses and findings presented in this report are based on the reviewed information, and whether guidelines in the associated analytical method, DoD QSM and QAPP were met. It should be noted that the final approved QAPP for this project indicated TestAmerica Sacramento was the primary laboratory. However, due to capacity issues with the laboratory, all samples were sent to and analyzed by, ELLE. Therefore, the accuracy tolerances reported in the data packages do not match those listed in the project QAPP. Per the DOD QSM 5.1, statistically derived in-house tolerances should be used for PFAS analysis. As these

tolerances differ between laboratories, the limits listed in the analytical reports from ELLE were used to evaluate accuracy.

External Injection Standard (EIS) responses were only used to qualify data when the recovery was excessively high or excessively low. Data associated with EIS recoveries below 10% or above 190% were rejected. Data associated with EIS recoveries below 20% but at or above 10%, or above 180% but at or below 190%, were qualified "J" as estimated. At these extremes, the associated sample data were considered impacted and estimated, or significantly impacted and rejected. Data associated with EIS recoveries between 20% and 180% were not considered significantly impacted and no data qualifiers were applied for EIS recoveries within this range.

A table detailing the data qualifiers applied, removed, or changed for the samples in this SDG as a result of the data validation process is included at the end of this report.

PFAS

General

The PFAS portion of this SDG consisted of twelve (12) samples, including five (5) environmental sediment samples, five (5) environmental water samples, one (1) EB, and one (1) FB. The samples were collected on June 10, 2019 and were analyzed for the following target list of 24 PFAS compounds as specified in the project-specific UFP-QAPP.

Analyte	CAS Number
Perfluorobutanoic acid (PFBA)	375-22-4
Perfluoropentanoic acid (PFPeA)	2706-90-3
Perfluorohexanoic acid (PFHxA)	307-24-4
Perfluoroheptanoic acid (PFHpA)	375-85-9
Perfluorooctanoic acid (PFOA)	335-67-1
Perfluorononanoic acid (PFNA)	375-95-1
Perfluorodecanoic acid (PFDA)	335-76-2
Perfluoroundecanoic acid (PFUnA)	2058-94-8
Perfluorododecanoic acid (PFDoA)	307-55-1
Perfluorotridecanoic acid (PFTriA)	72629-94-8
Perfluorotetradecanoic acid (PFTeA)	376-06-7
Perfluorobutanesulfonic acid (PFBS)	375-73-5
Perfluorohexanesulfonic acid (PFHxS)	355-46-4
Perfluoroheptanesulfonic acid (PFHpS)	375-92-8
Perfluorooctanesulfonic acid (PFOS)	1763-23-1
Perfluorodecanesulfonic acid (PFDS)	335-77-3
Perfluorooctane sulfonamide (PFOSA)	754-91-6
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	2991-50-6

Analyte	CAS Number
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	2355-31-9
1H,1H,2H,2H-perfluorooctane sulfonate (6:2 FTS)	27619-97-2
1H,1H,2H,2H-perfluorodecane sulfonate (8:2 FTS)	39108-34-4
1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2 FTS)	757124-72-4
Perflouro-1-nonanesulfonate (PFNS)	68259-12-1
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4

The PFAS analyses were performed in accordance with U.S. EPA Method 537 Modified (PFAS by LC/MS/MS Compliant with QSM 5.1 Table B-15). All samples in this SDG were analyzed following the procedures outlined in the DoD QSM, version 5.1 and the project-specific UFP-QAPP with exception of the previously noted accuracy tolerances.

The samples were prepared and analyzed within the holding time required by the method. The samples were prepared and analyzed in two batches. The samples were analyzed on one instrument under two initial calibrations (ICALs). All the water matrix samples were reanalyzed due to QC related deficiencies. The laboratory reported the most compliant run for each sample. Only the final reported analyses and the associated QC are discussed in this report.

Accuracy

Accuracy was evaluated using the percent recovery (%R) obtained from the laboratory control sample (LCS), LCS duplicate (LCSD) if analyzed, the Extracted Internal Standards (EIS), and the Injection Internal Standards (IIS). It should be noted that the laboratory report occasionally references the EIS as surrogate standards.

All LCS and LCSD recoveries were within acceptance criteria except as follows.

Batch # 19172004

Analyte	LCS %R	Criteria
PFBA	147	79-146%

The results for PFBA in the samples associated with this LCS were all non-detect. Therefore, data quality was not affected by the potential high bias and no corrective action was necessary.

All IIS recoveries were within acceptance criteria.

All EIS recoveries were within acceptance criteria except as follows:

Sample ID	Dilution	EIS	%R	Criteria
BRLTNDG-014-SW	1x	13C2-8:2-FTS	11	
BRLTNDG-011-SW	1x	13C2-8:2-FTS	10	
BRLTNDG-002-SW	1x	13C2-PFDoDA	2	
BRLTNDG-014-SW	1x	13C2-PFDoDA	2	
BRLTNDG-914-SW	1x	13C2-PFDoDA	3	
BRLTNDG-011-SW	1x	13C2-PFDoDA	1	

BRLTNDG-012-SW	1x	13C2-PFDoDA	6	20-180%
BRLTNDG-002-SW	1x	13C2-PFTeDA	0	
BRLTNDG-014-SW	1x	13C2-PFTeDA	0	
BRLTNDG-914-SW	1x	13C2-PFTeDA	0	
BRLTNDG-012-SW	1x	13C2-PFTeDA	5	
BRLTNDG061019-FB	1x	13C2-PFTeDA	0	
BRLTNDG061019-EB	1x	13C2-PFTeDA	0	
BRLTNDG-014-SW	1x	13C6-PFDA	14	
BRLTNDG-011-SW	1x	13C6-PFDA	11	
BRLTNDG-002-SW	1x	13C7-PFUnDA	8	
BRLTNDG-014-SW	1x	13C7-PFUnDA	7	
BRLTNDG-914-SW	1x	13C7-PFUnDA	11	
BRLTNDG-011-SW	1x	13C7-PFUnDA	5	
BRLTNDG-012-SW	1x	13C7-PFUnDA	18	
BRLTNDG-014-SW	1x	13C8-PFOS	19	
BRLTNDG-011-SW	1x	13C8-PFOS	14	
BRLTNDG-014-SW	1x	13C8-PFOSA	10	
BRLTNDG-011-SW	1x	13C8-PFOSA	9	
BRLTNDG-012-SW	1x	13C8-PFOSA	17	
BRLTNDG-002-SW	1x	d3-NMeFOSAA	12	
BRLTNDG-014-SW	1x	d3-NMeFOSAA	7	
BRLTNDG-914-SW	1x	d3-NMeFOSAA	18	
BRLTNDG-011-SW	1x	d3-NMeFOSAA	7	
BRLTNDG-012-SW	1x	d3-NMeFOSAA	17	
BRLTNDG-002-SW	1x	d5-NEtFOSAA	6	
BRLTNDG-014-SW	1x	d5-NEtFOSAA	6	
BRLTNDG-914-SW	1x	d5-NEtFOSAA	12	
BRLTNDG-011-SW	1x	d5-NEtFOSAA	5	
BRLTNDG-012-SW	1x	d5-NEtFOSAA	9	

The results for the native target compounds associated with non-compliant EIS were qualified as estimated and flagged “J” (if detected) or “UJ” (if non-detect) when the recovery was less than 20% but at or above 10%. The results for the native target compounds associated with non-compliant EIS were qualified “R” as rejected when the recoveries were less than 10%.

Precision

Precision was evaluated using the relative percent difference (RPD) obtained from the LCS/LCSD analyte results. Precision was further evaluated by comparing the FD analyte results.

All LCS/LCSD RPDs were within acceptance criteria.

All field duplicate RPDs were within acceptance criteria for the water matrix parent and FD. The RPD was not evaluated for sediment matrix parent and FD since all results were either non-detect or below the LOQ.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the DoD QSM and project-specific UFP-QAPP;
- Comparing actual analytical procedures to those described in the DoD QSM and project-specific UFP-QAPP;
- Evaluating holding times; and
- Examining field and laboratory blanks for cross contamination of samples during collection and analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the DoD QSM and project-specific UFP-QAPP. All samples were prepared and analyzed within the holding time required by the method. The following QC elements were also evaluated:

- All ICAL criteria were met.
- All initial calibration verification (ICV) criteria were met.
- All continuing calibration verification (CCV) criteria were met.
- All instrument sensitivity check (ISC) criteria were met.
- Raw data was spot-checked for qualitative and quantitative accuracy.
- Calculations were spot-checked and verified.

Two laboratory method blanks were associated with the PFAS analyses in this SDG. The laboratory method blanks were non-detect for all target PFAS analytes except as follows:

Method Blank ID	Analyte	Conc. (ng/l)	LOQ (ng/l)
BLK166002B	6:2-FTS	1.3	3.0

6:2-FTS was detected below the LOQ in the method blank. Results for 6:2-FTS that were below the LOQ in the associated samples were qualified as non-detect at the LOQ. Results detected above the LOQ in the associated samples were not affected by the blank contamination and were not qualified.

Source blank BRLTN-FDTAP-SB reported in SDG 2045561 was associated with all field samples in this SDG. The source blank sample consisted of onsite tap water used to rinse all reusable equipment. The source blank is only associated to the sediment samples since they were the only samples in this SDG that used reusable equipment. The source blank was non-detect for all target PFAS except as follows:

Source Blank ID	Analyte	Conc. (ng/L)	LOQ (ng/L)
BRLTN-FDTAP-SB	PFBS	0.39	1.8
	PFHpA	0.58	1.8
	PFHxS	0.48	1.8
	PFHxA	0.79	1.8
	PFOSA	1.1	2.7
	PFOS	1.0	1.8
	PFOA	1.1	1.8

Source blank results were reported in parts per trillion and sediment units were reported in parts per billion. Due to the magnitude of difference in results, the sediment sample results were not impacted by the low-level source blank contamination.

One equipment blank was associated with the sediment samples in this SDG. The equipment blank was non-detect for all target PFAS except as follows:

Equipment Blank ID	Analyte	Conc. (ng/L)	LOQ (ng/L)
BRLTNDG-061019-EB	PFOS	1.5 J	1.8
	6:2-FTS	1.1 J	2.7

Equipment blank results were reported in parts per trillion and sediment units were reported in parts per billion. Due to the magnitude of difference in results, the sediment sample results were not impacted by the low-level equipment blank contamination.

One field blank was associated with the samples in this SDG. The field blank was non-detect for all target PFAS analytes except as follows:

Field Blank ID	Analyte	Conc. (ng/L)	LOQ (ng/L)
BRLTNDG-061019-FB	6:2-FTS	1.1 J	2.8

Field blank results were reported in parts per trillion and sediment units were reported in parts per billion. Due to the magnitude of difference in results, the sediment sample results were not impacted by the low-level equipment blank contamination.

The associated water samples that were detected below the LOQ were qualified as non-detect and flagged “U” at the LOQ. Associated results detected above the LOQ were not qualified.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All results for PFAS in sediment for the samples in this SDG were considered usable. Therefore, the completeness for the PFAS portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

Twenty-six results for PFAS in water for the samples in this SDG were qualified “R” as rejected and were considered not usable. The completeness for the water matrix portion of

this SDG is 78% and does not meet the minimum acceptance criteria of 90%. However, the percent completeness for the overall data set was met for this site.

COMPARABILITY

All data was generated using contract-specific standard methods and reported with known data quality, type of analysis, units, etc.

SENSITIVITY

The LOD and LOQ values reported for the samples were compared to those listed in the QAPP to ensure that sensitivity requirements were met. Sample LODs and LOQs were adjusted based on dilution and/or initial/final volumes.

The LOD and LOQ values were below the project action limit (PAL) listed in the QAPP for all target PFAS.

DATA USABILITY

The purpose of this data validation report is to ensure the integrity and reliability of analytical laboratory data. The data quality is evaluated based on precision, accuracy, representativeness, comparability, and completeness (PARCC) characteristics of the data. Twenty-six PFAS results were qualified as rejected due to extreme exceedances in the associated EIS which causes those results to be unusable. Minor QC exceedances where data was qualified as estimated and flagged "J" are considered usable for the purposes of this project.

DATA QUALIFIER CHANGES

The following data qualifiers were added, removed, or changed as a result of the data validation process:

Sample ID	Analyte	Units	Original Result	Final Result	Reason Code
BRLTNDG-002-SW	6:2-FTS	ng/l	49 B	49	P3
BRLTNDG-014-SW	6:2-FTS	ng/l	1.6 JB	2.6 U	B4, B7
BRLTNDG-914-SW	6:2-FTS	ng/l	1.5 JB	2.7 U	B4, B7
BRLTNDG-011-SW	6:2-FTS	ng/l	110 B	110	P3
BRLTNDG-012-SW	6:2-FTS	ng/l	22 B	22	P3
BRLTNDG-014-SW	8:2-FTS	ng/l	1.7 U	1.7 UJ	I12
BRLTNDG-011-SW	8:2-FTS	ng/l	2.5 J	2.5 J	I12
BRLTNDG-002-SW	PFDoA	ng/l	1.0 U	1.0 R	I12
BRLTNDG-002-SW	PFTriA	ng/l	1.0 U	1.0 R	I12
BRLTNDG-014-SW	PFDoA	ng/l	1.0 U	1.0 R	I12
BRLTNDG-014-SW	PFTriA	ng/l	1.0 U	1.0 R	I12
BRLTNDG-914-SW	PFDoA	ng/l	1.1 U	1.1 R	I12

Sample ID	Analyte	Units	Original Result	Final Result	Reason Code
BRLTNDG-914-SW	PFTriA	ng/l	1.1 U	1.1 R	I12
BRLTNDG-011-SW	PFDoA	ng/l	1.1 U	1.1 R	I12
BRLTNDG-011-SW	PFTriA	ng/l	1.1 U	1.1 R	I12
BRLTNDG-012-SW	PFDoA	ng/l	1.0 U	1.0 R	I12
BRLTNDG-012-SW	PFTriA	ng/l	1.0 U	1.0 R	I12
BRLTNDG-002-SW	PFTeA	ng/l	1.0 U	1.0 R	I12
BRLTNDG-014-SW	PFTeA	ng/l	1.0 U	1.0 R	I12
BRLTNDG-914-SW	PFTeA	ng/l	1.1 U	1.1 R	I12
BRLTNDG-012-SW	PFTeA	ng/l	1.0 U	1.0 R	I12
BRLTNDG061019-FB	PFTeA	ng/l	1.1 U	1.1 R	I12
BRLTNDG061019-EB	PFTeA	ng/l	1.1 U	1.1 R	I12
BRLTNDG-014-SW	PFDA	ng/l	1.0 U	1.0 UJ	I12
BRLTNDG-011-SW	PFDA	ng/l	1.1 U	1.1 UJ	I12
BRLTNDG-002-SW	PFUnA	ng/l	1.0 U	1.0 R	I12
BRLTNDG-014-SW	PFUnA	ng/l	1.0 U	1.0 R	I12
BRLTNDG-914-SW	PFUnA	ng/l	1.1 U	1.1 UJ	I12
BRLTNDG-011-SW	PFUnA	ng/l	1.1 U	1.1 R	I12
BRLTNDG-012-SW	PFUnA	ng/l	1.0 U	1.0 UJ	I12
BRLTNDG-014-SW	PFOS	ng/l	110	110 J	I12
BRLTNDG-014-SW	PFNS	ng/l	2.0 U	2.0 UJ	I12
BRLTNDG-014-SW	PFDS	ng/l	2.0 U	2.0 UJ	I12
BRLTNDG-011-SW	PFOS	ng/l	310	310 J	I12
BRLTNDG-011-SW	PFNS	ng/l	2.2 U	2.2 UJ	I12
BRLTNDG-011-SW	PFDS	ng/l	2.2 U	2.2 UJ	I12
BRLTNDG-014-SW	PFOSA	ng/l	1.4 J	1.4 J	I12
BRLTNDG-012-SW	PFOSA	ng/l	2.5 U	2.5 UJ	I12
BRLTNDG-011-SW	PFOSA	ng/l	2.9	2.9 R	I12
BRLTNDG-002-SW	NMeFOSAA	ng/l	2.1 U	2.1 UJ	I12
BRLTNDG-014-SW	NMeFOSAA	ng/l	2.0 U	2.0 R	I12
BRLTNDG-914-SW	NMeFOSAA	ng/l	2.2 U	2.2 UJ	I12
BRLTNDG-011-SW	NMeFOSAA	ng/l	2.2 U	2.2 R	I12
BRLTNDG-012-SW	NMeFOSAA	ng/l	2.1 U	2.1 UJ	I12
BRLTNDG-002-SW	NEtFOSAA	ng/l	2.1 U	2.1 R	I12
BRLTNDG-014-SW	NEtFOSAA	ng/l	2.0 U	2.0 R	I12
BRLTNDG-914-SW	NEtFOSAA	ng/l	2.2 U	2.2 UJ	I12
BRLTNDG-011-SW	NEtFOSAA	ng/l	2.2 U	2.2 R	I12

Sample ID	Analyte	Units	Original Result	Final Result	Reason Code
BRLTNDG-012-SW	NEtFOSAA	ng/l	2.1 U	2.1 R	I12

DATA QUALIFIER DEFINITIONS

The data qualifiers are defined in Table 36.2 of the project-specific UFP-QAPP, as follows:

R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified. The data is unusable.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected. However, the reported LOD is approximate and may or may not accurately and precisely represent the concentration necessary to detect the analyte in the sample.
U	Analyte was not detected and is reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.

REASON CODE DEFINITIONS

Reason codes were used to document the logic behind all data validation qualifiers. The following reason codes for data qualification were associated with the samples in this SDG:

I12: EIS percent recovery infraction with no assignable bias

B4: Method Blank Infraction (Qualified Detect)

B7: Field Blank Infraction (Qualified Detect)

P3: Professional Judgment

DATA VALIDATION SUMMARY REPORT

for samples collected from

BURLINGTON AIR NATIONAL GUARD BASE

SOUTH BURLINGTON, VERMONT

Data Validation by: Beth Driskill

Report Date: September 20, 2019

Parsons - Austin

INTRODUCTION

The following data validation summary report covers seven (7) water samples. The samples were collected from Burlington Air National Guard (ANG) Base in South Burlington, Vermont on June 10, 2019. The samples were logged under the following Sample Delivery Group (SDG):

2048448

The samples in this SDG were analyzed for per- and polyfluoroalkyl substances (PFAS) by U.S. EPA Method 537 modified. The following table details the samples included in this SDG and the analytical parameters performed. The field quality control (QC) samples collected in association with this SDG included one (1) field duplicate (FD) and one (1) FB sample. The FB is included in SDG 2048446. No equipment blank was associated with the samples in this SDG because the samples were collected from established wells with dedicated sampling equipment.

All samples were collected by Parsons and were hand delivered on ice to Eurofins TestAmerica (TA) in South Burlington, Vermont in two coolers on June 11, 2019 TA-Burlington then shipped the samples to Eurofins Lancaster Laboratories Environmental (ELLE). The planning documents for this site originally indicated the samples would be analyzed by TestAmerica in Sacramento, California (TA-Sacramento). However, upon initiation of the project, TA-Sacramento did not have sufficient capacity to meet the requirements of the project and therefore, the work was transferred to ELLE. ELLE performed all analyses related to this project. The samples were received in good condition at acceptable temperatures of 3.3 and 0.9 degrees Celsius.

All samples were prepared and analyzed following the procedures outlined in the project-specific Uniform Federal Policy - Quality Assurance Project Plan (UFP-QAPP) and the Department of Defense (DoD) Quality Systems Manual (QSM) Version 5.1.

SAMPLE IDs AND REQUESTED PARAMETERS

Sample ID	Matrix	COMMENTS
V1-BR-08-01	Water	
V1-RFW2-01	Water	
V1-RFW2-91	Water	FD of V1-RFW2-01

Sample ID	Matrix	COMMENTS
V1-MW12-01	Water	
MW-105-01	Water	
V1-MW-106-01	Water	
V1-MW1-01	Water	

Note: All samples listed above were analyzed for the PFAS method listed in the table below.

EXTRACTION, ANALYTICAL, AND REPORTING DETAILS

Parameter	Matrix	Prep Method	Analytical Method	Units
PFAS	Water	EPA 537 Modified*	EPA 537 Modified	ng/l

ng/l = nanogram per liter

*PFAS by LC/MS/MS compliant with QSM 5.1 Table B-15

EVALUATION CRITERIA

The Level IV data package submitted by the laboratory has been reviewed and verified following the guidelines outlined in the project-specific UFP-QAPP and DoD QSM 5.1. Data qualification was performed following the spirit of the National Functional Guidelines for Organic Data Review even though this document does not specifically include the method for PFAS.

Information reviewed in the data packages included sample results; field and laboratory quality control results; instrument calibration; calibration verifications; case narratives; sample receipt forms, and chain-of-custody (COC) forms. The analyses and findings presented in this report are based on the reviewed information, and whether guidelines in the associated analytical method, DoD QSM and QAPP were met. It should be noted that the final approved QAPP for this project indicated TestAmerica Sacramento was the primary laboratory. However, due to capacity issues with the laboratory, all samples were sent to and analyzed by, ELLE. Therefore, the accuracy tolerances reported in the data packages do not match those listed in the project QAPP. Per the DOD QSM 5.1, statistically derived in-house tolerances should be used for PFAS analysis. As these tolerances differ between laboratories, the limits listed in the analytical reports from ELLE were used to evaluate accuracy.

External Injection Standard (EIS) responses were only used to qualify data when the recovery was excessively high or excessively low. Data associated with EIS recoveries below 10% or above 190% were rejected. Data associated with EIS recoveries below 20% but at or above 10%, or above 180% but at or below 190%, were qualified “J” as estimated. At these extremes, the associated sample data were considered impacted and estimated, or significantly impacted and rejected. Data associated with EIS recoveries between 20% and 180% were not considered significantly impacted and no data qualifiers were applied for EIS recoveries within this range.

A table detailing the data qualifiers applied, removed, or changed for the samples in this SDG as a result of the data validation process is included at the end of this report.

PFAS

General

The PFAS portion of this SDG consisted of seven (7) environmental water samples. The samples were collected on June 10, 2019 and were analyzed for the following target list of 24 PFAS analytes as specified in the project-specific UFP-QAPP.

Analyte	CAS Number
Perfluorobutanoic acid (PFBA)	375-22-4
Perfluoropentanoic acid (PFPeA)	2706-90-3
Perfluorohexanoic acid (PFHxA)	307-24-4
Perfluoroheptanoic acid (PFHpA)	375-85-9
Perfluorooctanoic acid (PFOA)	335-67-1
Perfluorononanoic acid (PFNA)	375-95-1
Perfluorodecanoic acid (PFDA)	335-76-2
Perfluoroundecanoic acid (PFUnA)	2058-94-8
Perfluorododecanoic acid (PFDoA)	307-55-1
Perfluorotridecanoic Acid (PFTriA)	72629-94-8
Perfluorotetradecanoic acid (PFTeA)	376-06-7
Perfluorobutanesulfonic acid (PFBS)	375-73-5
Perfluorohexanesulfonic acid (PFHxS)	355-46-4
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8
Perfluorooctanesulfonic acid (PFOS)	1763-23-1
Perfluorodecanesulfonic acid (PFDS)	335-77-3
Perfluorooctane Sulfonamide (PFOSA)	754-91-6
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	2991-50-6
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	2355-31-9
1H,1H,2H,2H-perfluorooctane sulfonate (6:2 FTS)	27619-97-2
1H,1H,2H,2H-perfluorodecane sulfonate (8:2 FTS)	39108-34-4
1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2 FTS)	757124-72-4
Perflouro-1-nonanesulfonate (PFNS)	68259-12-1
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4

The PFAS analyses were performed in accordance with U.S. EPA Method 537 Modified (PFAS by LC/MS/MS Compliant with QSM 5.1 Table B-15). All samples in this SDG were analyzed following the procedures outlined in the DoD QSM, version 5.1 and the project-specific UFP-QAPP with exception of the previously noted accuracy tolerances.

The samples were prepared and analyzed within the holding time required by the method. The samples were prepared and analyzed in one batch. The samples were analyzed on one instrument under one initial calibration (ICAL).

Accuracy

Accuracy was evaluated using the percent recovery (%R) obtained from the laboratory control sample (LCS), the Extracted Internal Standard (EIS) analytes (also referred to as surrogates in the laboratory report), and Injection Internal Standards (IIS) analytes.

All LCS recoveries were within acceptance criteria.

All IIS analytes were within acceptance criteria.

All EIS analytes were within acceptance criteria of 20-180%.

Precision

Precision was evaluated using the RPD obtained from the FD analyte results.

All field duplicate RPDs were within acceptance criteria except as follows:

Analyte	RPD	Criteria
PFOSA	40	RPD ≤ 30

The PFOSA result in parent sample V1-RFW2-01 and the associated field duplicate were qualified "J" as estimated due to the variability demonstrated.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the DoD QSM and project-specific UFP-QAPP;
- Comparing actual analytical procedures to those described in the DoD QSM and project-specific UFP-QAPP;
- Evaluating holding times; and
- Examining field and laboratory blanks for cross contamination of samples during collection and analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the DoD QSM and project-specific UFP-QAPP. All samples were prepared and analyzed within the holding time required by the method. The following QC elements were also evaluated:

- All ICAL criteria were met.
- All initial calibration verification (ICV) criteria were met.
- All continuing calibration verification (CCV) criteria were met.
- All instrument sensitivity check (ISC) criteria were met.
- Raw data was spot-checked for qualitative and quantitative accuracy.

- Calculations were spot-checked and verified.

One laboratory method blank was associated with the PFAS analyses in this SDG. The laboratory method blank was non-detect for all target PFAS analytes except as follows.

Method Blank ID	Analyte	Conc. (ng/g)	LOQ (ng/g)
BLK166002B	6:2-FTS	1.3	3.0

No corrective action necessary since all sample results were above the LOQ for 6:2-FTS.

One field blank was associated to the soil samples in this SDG. The field blank is included in SDG 2048446 and was non-detect for all target PFAS analytes except as follows.

Field Blank ID	Analyte	Conc. (ng/g)	LOQ (ng/g)
BRLTNDG-061019-FB	6:2-FTS	1.1	2.8

No corrective action necessary since all sample results were above the LOQ for 6:2-FTS.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All results for PFAS for the samples in this SDG were considered usable. Therefore, the completeness for the PFAS portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

COMPARABILITY

All data was generated using contract-specific standard methods and reported with known data quality, type of analysis, units, etc.

SENSITIVITY

The LOD and LOQ values reported for the samples were compared to those listed in the QAPP to ensure that sensitivity requirements were met. Sample LODs and LOQs were adjusted based on dilution and/or initial/final volumes.

The LOD and LOQ values were below the project action limit (PAL) listed in the QAPP for all target PFAS.

DATA USABILITY

The purpose of this data validation report is to ensure the integrity and reliability of analytical laboratory data. The data quality is evaluated based on precision, accuracy, representativeness, comparability, and completeness (PARCC) characteristics of the data. The validated data indicated that the laboratory correctly performed the analyses. Based on the data quality assessment, no results were rejected. Although minor QC exceedances were identified for this data set, all data is considered usable for the purposes of this project.

DATA QUALIFIER CHANGES

The following data qualifiers were added, removed, or changed as a result of the data validation process:

Sample ID	Analyte	Units	Original Result	Final Result	Reason Code
V1-BR-08-01	6:2FTS	ng/l	310 B	310	P3
V1-RFW2-01	6:2FTS	ng/l	500 B	500	P3
V1-RFW2-91	6:2FTS	ng/l	550 B	550	P3
V1-MW12-01	6:2FTS	ng/l	330 B	330	P3
MW-105-01	6:2FTS	ng/l	270 B	270	P3
V1-MW-106-01	6:2FTS	ng/l	420 B	420	P3
V1-MW1-01	6:2FTS	ng/l	260 B	260	P3
V1-RFW2-01	PFOSA	ng/l	160	160 J	D1
V1-RFW2-91	PFOSA	ng/l	240	240 J	D1

DATA QUALIFIER DEFINITIONS

The data qualifiers are defined in Table 36.2 of the project-specific UFP-QAPP, as follows:

R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified. The data is unusable.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected. However, the reported LOD is approximate and may or may not accurately and precisely represent the concentration necessary to detect the analyte in the sample.
U	Analyte was not detected and is reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.

REASON CODE DEFINITIONS

Reason codes were used to document the logic behind all data validation qualifiers. The following reason codes for data qualification were associated with the samples in this SDG:

D1: Field Duplicate Precision Infraction

P3: Professional Judgment

DATA VALIDATION SUMMARY REPORT

for samples collected from

BURLINGTON AIR NATIONAL GUARD BASE

SOUTH BURLINGTON, VERMONT

Data Validation by: Sandra de las Fuentes

Report Date: August 30, 2019

Parsons - Austin

INTRODUCTION

The following data validation summary report covers fourteen (14) water samples, one (1) equipment blank (EB), and one (1) field blank (FB). The samples were collected from Burlington Air National Guard (ANG) Base in South Burlington, Vermont on June 11, 2019. The samples were logged under the following Sample Delivery Group (SDG):

2048746

The samples in this SDG were analyzed for per- and polyfluoroalkyl substances (PFAS) by U.S. EPA Method 537 modified. The following table details the sample IDs and requested parameters. The field quality control (QC) samples included were four field duplicates (FD), one EB, one FB, and one source blank (SB). The SB was reported in SDG 2045561. The EB was only associated with a select list of samples, as noted in the table below. All other samples in this SDG were collected using disposable equipment only.

All samples were collected by Parsons and were shipped by FedEx on June 12, 2019 to Eurofins Lancaster Laboratories Environmental (ELLE). The samples were received by ELLE in good condition and at acceptable temperatures of 2.0 and 3.7 degrees Celsius.

All samples were prepared and analyzed following the procedures outlined in the project-specific Uniform Federal Policy - Quality Assurance Project Plan (UFP-QAPP) and the Department of Defense (DoD) Quality Systems Manual (QSM) Version 5.1.

SAMPLE IDs AND REQUESTED PARAMETERS

Sample ID	Matrix	COMMENTS
Well59-01	Water	
Well59-91	Water	FD of Well59-01
BTV-MW-5-01	Water	
BTV-MW-5-91	Water	FD of BTV-MW-5-01
BRLTNDG-011-ST	Water	
BRLTNDG-911-ST	Water	FD of BRLTNDG-011-ST
BRLTNDG-012-ST	Water	
BRLTNDG-001-ST	Water	

Sample ID	Matrix	COMMENTS
BRLTNDG-016-ST	Water	
BRLTNDG-014-ST	Water	
BRLTNDG-914-ST	Water	FD of BRLTNDG-014-ST
BRLTNDG-007-ST	Water	MS/MSD
BRLTNDG-061119-FB	Water	Field blank
BRLTNDG-061119-EB	Water	EB for submersible pump tubing, used only for BTV-MW-5-01 and BTV-MW-5-91
MW-101-01	Water	
V4-MW-5-01	Water	

Note: All samples listed above were analyzed for the PFAS method listed in the table below.

EXTRACTION, ANALYTICAL, AND REPORTING DETAILS

Parameter	Matrix	Prep Method	Analytical Method	Units
PFAS	Water	EPA 537 Modified*	EPA 537 Modified *	ng/l

ng/l = nanogram per liter

* PFAS by LC/MS/MS Compliant with QSM 5.1 Table B-15

EVALUATION CRITERIA

The Level IV data package submitted by the laboratory has been reviewed and verified following the guidelines outlined in the project-specific UFP-QAPP and DoD QSM 5.1. Data qualification was performed following the spirit of the National Functional Guidelines for Organic Data Review even though this document does not specifically include the method for PFAS.

Information reviewed in the data packages included sample results; field and laboratory quality control results; instrument calibration; calibration verifications; case narratives; sample receipt forms, and chain-of-custody (COC) forms. The analyses and findings presented in this report are based on the reviewed information, and whether guidelines in the associated analytical method, DoD QSM and QAPP were met. It should be noted that the final approved QAPP for this project indicated TestAmerica Sacramento was the primary laboratory. However, due to capacity issues with the laboratory, all samples were sent to and analyzed by, ELLE. Therefore, the accuracy tolerances reported in the data packages do not match those listed in the project QAPP. Per the DOD QSM 5.1, statistically derived in-house tolerances should be used for PFAS analysis. As these tolerances differ between laboratories, the limits listed in the analytical reports from ELLE were used to evaluate accuracy.

External Injection Standard (EIS) responses were only used to qualify data when the recovery was excessively high or excessively low. Data associated with EIS recoveries below 10% or above 190% were rejected. Data associated with EIS recoveries below 20% but at or above 10%, or above 180% but at or below 190%, were qualified “J” as estimated.

At these extremes, the associated sample data were considered impacted and estimated, or significantly impacted and rejected. Data associated with EIS recoveries between 20% and 180% were not considered significantly impacted and no data qualifiers were applied for EIS recoveries within this range.

A table detailing the data qualifiers applied, removed, or changed for the samples in this SDG as a result of the data validation process is included at the end of this report.

PFAS

General

The PFAS portion of this SDG consisted of sixteen (16) samples, including fourteen (14) environmental water samples, one (1) EB, and one (1) FB. The samples were collected on June 11, 2019 and were analyzed for the following target list of 24 PFAS compounds as specified in the project-specific UFP-QAPP.

Analyte	CAS Number
Perfluorobutanoic acid (PFBA)	375-22-4
Perfluoropentanoic acid (PFPeA)	2706-90-3
Perfluorohexanoic acid (PFHxA)	307-24-4
Perfluoroheptanoic acid (PFHpA)	375-85-9
Perfluorooctanoic acid (PFOA)	335-67-1
Perfluorononanoic acid (PFNA)	375-95-1
Perfluorodecanoic acid (PFDA)	335-76-2
Perfluoroundecanoic acid (PFUnA)	2058-94-8
Perfluorododecanoic acid (PFDoA)	307-55-1
Perfluorotridecanoic Acid (PFTriA)	72629-94-8
Perfluorotetradecanoic acid (PFTeA)	376-06-7
Perfluorobutanesulfonic acid (PFBS)	375-73-5
Perfluorohexanesulfonic acid (PFHxS)	355-46-4
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8
Perfluorooctanesulfonic acid (PFOS)	1763-23-1
Perfluorodecanesulfonic acid (PFDS)	335-77-3
Perfluorooctane Sulfonamide (PFOSA)	754-91-6
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	2991-50-6
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	2355-31-9
1H,1H,2H,2H-perfluorooctane sulfonate (6:2 FTS)	27619-97-2
1H,1H,2H,2H-perfluorodecane sulfonate (8:2 FTS)	39108-34-4
1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2 FTS)	757124-72-4
Perflouro-1-nonanesulfonate (PFNS)	68259-12-1
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4

The PFAS analyses were performed in accordance with U.S. EPA Method 537 Modified (PFAS by LC/MS/MS Compliant with QSM 5.1 Table B-15). All samples in this SDG were analyzed following the procedures outlined in the DoD QSM, version 5.1 and the project-specific UFP-QAPP with exception of the previously noted accuracy tolerances.

The samples were prepared and analyzed within the holding time required by the method. The samples were prepared and analyzed in one batch. The samples were analyzed on one instrument under one ICAL. Some of the samples were reanalyzed due to QC related deficiencies. The laboratory reported the most compliant run for each sample. Only the final reported analyses and the associated QC are discussed in this report.

Accuracy

Accuracy was evaluated using the percent recovery (%R) obtained from the laboratory control sample (LCS), matrix spike (MS) matrix spike duplicate (MSD), the Extracted Internal Standard (EIS) analytes (also referred to as surrogates in the laboratory report), and the Injection Internal Standards (IIS). Sample BRLTNDG-007-ST was designated on the COC for MS/MSD analysis.

All LCS recoveries were within acceptance criteria.

All MS and MSD recoveries were within acceptance criteria except as follows:

Analyte	MS %R	MSD %R	Criteria
PFOSA	(111)	131	73-121%

( ) indicates the recovery met criteria

PFOSA recovered high in the MSD and was non-detect in the parent sample. Therefore, no corrective action was necessary.

All IIS recoveries were within acceptance criteria.

All EIS recoveries were within acceptance criteria except as follows:

Sample ID	Dilution	EIS	%R	Criteria
BTV-MW-5-91	1x	13C2-4:2-FTS	186	20-180%
BRLTNDG-011-ST	1x	13C2-4:2-FTS	362	
BRLTNDG-911-ST	1x	13C2-4:2-FTS	396	
BRLTNDG-012-ST	1x	13C2-4:2-FTS	405	
BRLTNDG-001-ST	1x	13C2-4:2-FTS	399	
BRLTNDG-016-ST	1x	13C2-4:2-FTS	287	
BRLTNDG-014-ST	1x	13C2-4:2-FTS	290	
BRLTNDG-007-ST	1x	13C2-4:2-FTS	343	
BRLTNDG-011-ST	1x	13C2-6:2-FTS	212	
BRLTNDG-911-ST	1x	13C2-6:2-FTS	270	
BRLTNDG-012-ST	1x	13C2-6:2-FTS	230	
BRLTNDG-001-ST	1x	13C2-6:2-FTS	266	
BRLTNDG-016-ST	1x	13C2-6:2-FTS	213	

Sample ID	Dilution	EIS	%R	Criteria
BRLTNDG-007-ST	1x	13C2-6:2-FTS	243	
BRLTNDG-011-ST	1x	13C2-PFDoDA	14	
BRLTNDG-914-ST	1x	13C2-PFDoDA	12	
BRLTNDG-011-ST	1x	13C2-PFTeDA	1	
BRLTNDG-001-ST	1x	13C2-PFTeDA	15	
BRLTNDG-016-ST	1x	13C2-PFTeDA	12	
BRLTNDG-014-ST	1x	13C2-PFTeDA	7	
BRLTNDG-914-ST	1x	13C2-PFTeDA	2	
BRLTNDG-007-ST	1x	13C2-PFTeDA	4	
BRLTNDG-911-ST	1x	13C8-PFOSA	11	
BRLTNDG-012-ST	1x	13C8-PFOSA	19	
BRLTNDG-914-ST	1x	13C8-PFOSA	15	
BRLTNDG-007-ST	1x	13C8-PFOSA	19	
BRLTNDG-914-ST	1x	d5-NEtFOSAA	19	

The native target compounds associated with the non-compliant EIS were qualified as estimated (J/UJ) when the recovery was less than 20% but at or above 10% and rejected (R) when the recoveries were less than 10% or greater than 190%.

Precision

Precision was evaluated using the relative percent difference (RPD) obtained from the MS/MSD analyte results. Precision was further evaluated by comparing the FD analyte results.

All MS/MSD RPDs were within acceptance criteria.

All field duplicate RPDs were within acceptance criteria.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the DoD QSM and project QAPP;
- Comparing actual analytical procedures to those described in the DoD QSM and project-specific UFP-QAPP;
- Evaluating holding times; and
- Examining field and laboratory blanks for cross contamination of samples during collection and analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the DoD QSM and project-specific UFP-QAPP. All samples were prepared

and analyzed within the holding time required by the method. The following QC elements were also evaluated:

- All initial calibration criteria were met.
- All initial calibration verification (ICV) criteria were met.
- All continuing calibration verification (CCV) criteria were met.
- All instrument sensitivity check (ISC) criteria were met.
- Raw data was spot-checked for qualitative and quantitative accuracy.
- Calculations were spot-checked and verified.

One laboratory method blank was associated with the PFAS analyses in this SDG. The laboratory method blank was non-detect for all target PFAS analytes.

A SB was included in SDG 2045561 and was only associated with BTV-MW-5-01 and BTV-MW-5-91, as these two samples were collected using a non-dedicated submersible pump. All other samples were collected with dedicated or disposable equipment. The SB consists of onsite tap water used to rinse all reusable equipment. The source blank sample consists of onsite tap water used to rinse all reusable equipment and is also associated with equipment blank BRLTNDG-061119-EB. The SB was non-detect for all target PFAS analytes except as follows:

Source Blank ID	Analyte	Conc. (ng/L)	LOQ (ng/L)
BRLTN-FDTAP-SB	PFBS	0.39 J	1.8
	PFHpA	0.58 J	1.8
	PFHxS	0.48 J	1.8
	PFHxA	0.79 J	1.8
	PFOSA	1.1 J	2.7
	PFOS	1.0 J	1.8
	PFOA	1.1 J	1.8

The analytes listed above were all detected at concentrations greater than the LOQ in samples BTV-MW-5-01 and BTV-MW-5-91. Therefore, no corrective action was necessary.

BRLTNDG-061119-EB was associated with BTV-MW-5-01 and BTV-MW-5-91. The equipment blank sample was non-detect for all target PFAS analytes.

One field blank was associated with the samples in this SDG. The field blank was non-detect for all target PFAS analytes.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

Seventeen results for the samples in this SDG were qualified "R" as rejected and considered unusable. Therefore, the completeness for the PFAS portion of this SDG is 96%, which meets the minimum acceptance criteria of 90%.

COMPARABILITY

All data was generated using contract-specific standard methods and reported with known data quality, type of analysis, units, etc.

SENSITIVITY

The LOD and LOQ values reported for the samples were compared to those listed in the QAPP to ensure that sensitivity requirements were met. Sample LODs and LOQs were adjusted based on dilution and/or initial/final volumes.

The LOD and LOQ values were below the project action limit (PAL) listed in the QAPP for all target PFAS.

DATA USABILITY

The purpose of this data validation report is to ensure the integrity and reliability of analytical laboratory data. The data quality is evaluated based on precision, accuracy, representativeness, comparability, and completeness (PARCC) characteristics of the data. Seventeen PFAS results were qualified as rejected due to extreme exceedances in the associated EIS which causes those results to be unusable. All other data is considered usable for the purposes of this project.

DATA QUALIFIER CHANGES

The following data qualifiers were added, removed, or changed as a result of the data validation process:

Sample ID	Analyte	Units	Original Result	Final Result	Reason Code
BTV-MW-5-91	4:2FTS	ng/l	1.8 U	1.8 UJ	I12
BRLTNDG-011-ST	4:2FTS	ng/l	1.9 U	1.9 R	I12
BRLTNDG-011-ST	6:2FTS	ng/l	1.9 U	1.9 R	I12
BRLTNDG-011-ST	PFDoA	ng/l	1.1 U	1.1 UJ	I12
BRLTNDG-011-ST	PFTeA	ng/l	1.1 U	1.1 R	I12
BRLTNDG-011-ST	PFTriA	ng/l	1.1 U	1.1 UJ	I12
BRLTNDG-911-ST	4:2FTS	ng/l	1.8 U	1.8 R	I12
BRLTNDG-911-ST	6:2FTS	ng/l	1.8 U	1.8 R	I12
BRLTNDG-911-ST	PFOSA	ng/l	2.5 U	2.5 UJ	I12
BRLTNDG-012-ST	4:2FTS	ng/l	1.8 U	1.8 R	I12
BRLTNDG-012-ST	6:2FTS	ng/l	170	170 R	I12
BRLTNDG-012-ST	PFOSA	ng/l	2.6 J	2.6 J	I12

Sample ID	Analyte	Units	Original	Final	Reason
BRLTNDG-001-ST	4:2FTS	ng/l	1.8 U	1.8 R	I12
BRLTNDG-001-ST	6:2FTS	ng/l	8.7	8.7 R	I12
BRLTNDG-001-ST	PFTeA	ng/l	1.1 U	1.1 UJ	I12
BRLTNDG-016-ST	4:2FTS	ng/l	1.7 U	1.7 R	I12
BRLTNDG-016-ST	6:2FTS	ng/l	1.7 U	1.7 R	I12
BRLTNDG-016-ST	PFTeA	ng/l	1.0 U	1.0 UJ	I12
BRLTNDG-014-ST	4:2FTS	ng/l	1.7 U	1.7 R	I12
BRLTNDG-014-ST	PFTeA	ng/l	1.0 U	1.0 R	I12
BRLTNDG-914-ST	PFOSA	ng/l	11	11 J	I12
BRLTNDG-914-ST	NEtFOSAA	ng/l	2.1 U	2.1 UJ	I12
BRLTNDG-914-ST	PFDoA	ng/l	1.0 U	1.0 UJ	I12
BRLTNDG-914-ST	PFTeA	ng/l	1.0 U	1.0 R	I12
BRLTNDG-914-ST	PFTriA	ng/l	1.0 U	1.0 UJ	I12
BRLTNDG-007-ST	4:2FTS	ng/l	1.9 U	1.9 R	I12
BRLTNDG-007-ST	6:2FTS	ng/l	2.1 J	2.1 R	I12
BRLTNDG-007-ST	PFOSA	ng/l	2.8 U	2.8 UJ	I12
BRLTNDG-007-ST	PFTeA	ng/l	1.1 U	1.1 R	I12

DATA QUALIFIER DEFINITIONS

The data qualifiers are defined in Table 36.2 of the project-specific UFP-QAPP, as follows:

R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified. The data is unusable.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected. However, the reported LOD is approximate and may or may not accurately and precisely represent the concentration necessary to detect the analyte in the sample.
U	Analyte was not detected and is reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.

REASON CODE DEFINITIONS

Reason codes were used to document the logic behind all data validation qualifiers. The following reason codes for data qualification were associated with the samples in this SDG:

I12: EIS percent recovery infraction with no assigned bias

DATA VALIDATION SUMMARY REPORT

for samples collected from

BURLINGTON AIR NATIONAL GUARD BASE

SOUTH BURLINGTON, VERMONT

Data Validation by: Sandra de las Fuentes

Report Date: August 30, 2019

Parsons - Austin

INTRODUCTION

The following data validation summary report covers two (2) water samples and one (1) field blank (FB). The samples were collected from Burlington Air National Guard (ANG) Base in South Burlington, Vermont on June 12, 2019. The samples were logged under the following Sample Delivery Group (SDG):

2049107

The samples in this SDG were analyzed for per- and polyfluoroalkyl substances (PFAS) by U.S. EPA Method 537 modified. The following table details the sample IDs and requested parameters. The field quality control (QC) sample collected in association with this SDG was one FB. No equipment blank was associated with the samples in the SDG since the samples were collected using disposable equipment only.

All samples were collected by Parsons and were shipped by FedEx on June 12, 2019 to Eurofins Lancaster Laboratories Environmental (ELLE). The samples were received by ELLE in good condition and at an acceptable temperature of 1.1 degrees Celsius.

All samples were prepared and analyzed following the procedures outlined in the project-specific Uniform Federal Policy - Quality Assurance Project Plan (UFP-QAPP) and the Department of Defense (DoD) Quality Systems Manual (QSM) Version 5.1.

SAMPLE IDs AND REQUESTED PARAMETERS

Sample ID	Matrix	COMMENTS
BTV-MW-14-01	Water	
BTV-MW-9-01	Water	
BRLTN-061219-FB	Water	Field Blank

Note: All samples listed above were analyzed for the PFAS method listed in the table below.

EXTRACTION, ANALYTICAL, AND REPORTING DETAILS

Parameter	Matrix	Prep Method	Analytical Method	Units
PFAS	Water	EPA 537 Modified*	EPA 537 Modified*	ng/l

ng/l = nanogram per liter

* PFAS by LC/MS/MS Compliant with QSM 5.1 Table B-15

EVALUATION CRITERIA

The Level IV data package submitted by the laboratory has been reviewed and verified following the guidelines outlined in the project-specific UFP-QAPP and DoD QSM 5.1. Data qualification was performed following the spirit of the National Functional Guidelines for Organic Data Review even though this document does not specifically include the method for PFAS.

Information reviewed in the data packages included sample results; field and laboratory quality control results; instrument calibration; calibration verifications; case narratives; sample receipt forms, and chain-of-custody (COC) forms. The analyses and findings presented in this report are based on the reviewed information, and whether guidelines in the associated analytical method, DoD QSM and QAPP were met. It should be noted that the final approved QAPP for this project indicated TestAmerica Sacramento was the primary laboratory. However, due to capacity issues with the laboratory, all samples were sent to and analyzed by, ELLE. Therefore, the accuracy tolerances reported in the data packages do not match those listed in the project QAPP. Per the DOD QSM 5.1, statistically derived in-house tolerances should be used for PFAS analysis. As these tolerances differ between laboratories, the limits listed in the analytical reports from ELLE were used to evaluate accuracy.

External Injection Standard (EIS) responses were only used to qualify data when the recovery was excessively high or excessively low. Data associated with EIS recoveries below 10% or above 190% were rejected. Data associated with EIS recoveries below 20% but at or above 10%, or above 180% but at or below 190%, were qualified "J" as estimated. At these extremes, the associated sample data were considered impacted and estimated, or significantly impacted and rejected. Data associated with EIS recoveries between 120% and 180% were not considered significantly impacted and no data qualifiers were applied for EIS recoveries within this range.

A table detailing the data qualifiers applied, removed, or changed for the samples in this SDG as a result of the data validation process is included at the end of this report.

PFAS

General

The PFAS portion of this SDG consisted of three (3) samples, including two (2) environmental water samples and one (1) FB. The samples were collected on June 12, 2019 and were analyzed for the following target list of 24 PFAS compounds as specified in the project-specific UFP-QAPP.

Analyte	CAS Number
Perfluorobutanoic acid (PFBA)	375-22-4
Perfluoropentanoic acid (PFPeA)	2706-90-3
Perfluorohexanoic acid (PFHxA)	307-24-4
Perfluoroheptanoic acid (PFHpA)	375-85-9
Perfluorooctanoic acid (PFOA)	335-67-1
Perfluorononanoic acid (PFNA)	375-95-1
Perfluorodecanoic acid (PFDA)	335-76-2
Perfluoroundecanoic acid (PFUnA)	2058-94-8
Perfluorododecanoic acid (PFDoA)	307-55-1
Perfluorotridecanoic Acid (PFTriA)	72629-94-8
Perfluorotetradecanoic acid (PFTeA)	376-06-7
Perfluorobutanesulfonic acid (PFBS)	375-73-5
Perfluorohexanesulfonic acid (PFHxS)	355-46-4
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8
Perfluorooctanesulfonic acid (PFOS)	1763-23-1
Perfluorodecanesulfonic acid (PFDS)	335-77-3
Perfluorooctane Sulfonamide (PFOSA)	754-91-6
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	2991-50-6
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	2355-31-9
1H,1H,2H,2H-perfluorooctane sulfonate (6:2 FTS)	27619-97-2
1H,1H,2H,2H-perfluorodecane sulfonate (8:2 FTS)	39108-34-4
1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2 FTS)	757124-72-4
Perflouro-1-nonanesulfonate (PFNS)	68259-12-1
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4

The PFAS analyses were performed in accordance with U.S. EPA Method 537 Modified (PFAS by LC/MS/MS Compliant with QSM 5.1 Table B-15). All samples in this SDG were analyzed following the procedures outlined in the DoD QSM, version 5.1 and the project-specific UFP-QAPP with exception of the previously noted accuracy tolerances.

The samples were prepared and analyzed within the holding time required by the method. The samples were prepared and analyzed in two batches. The samples were analyzed on one instrument under one initial calibration (ICAL). Some of the samples were reanalyzed due to QC related deficiencies. The laboratory reported the most compliant run for each sample. Only the final reported analyses and the associated QC are discussed in this report.

Accuracy

Accuracy was evaluated using the percent recovery (%R) obtained from the laboratory control sample (LCS), the Extracted Internal Standard (EIS) analytes (also referred to as surrogates in the laboratory report), and Injection Internal Standards (IIS) analytes.

All LCS and LCSD recoveries were within acceptance criteria except as follows:

Batch # 19172013

Analyte	LCS %R	LCSD %R	Criteria
8:2-FTS	139	140	62-133%

The results for 8:2-FTS in the associated samples, BTV-MW-14-01 and BTV-MW-9-01, were non-detect. Therefore, data quality was not affected, and no corrective action was necessary.

All IIS recoveries were within acceptance criteria.

All EIS recoveries were within acceptance criteria.

Precision

Precision was evaluated using the relative percent difference (RPD) obtained from the LCS/LCSD analyte results.

All LCS/LCSD RPDs were within acceptance criteria.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the DoD QSM and project QAPP;
- Comparing actual analytical procedures to those described in the DoD QSM and project-specific UFP-QAPP;
- Evaluating holding times; and
- Examining field and laboratory blanks for cross contamination of samples during collection and analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the DoD QSM and project-specific UFP-QAPP. All samples were prepared and analyzed within the holding time required by the method. The following QC elements were also evaluated:

- All initial calibration criteria were met.
- All initial calibration verification (ICV) criteria were met.
- All continuing calibration verification (CCV) criteria were met.
- All instrument sensitivity check (ISC) criteria were met.
- Raw data was spot-checked for qualitative and quantitative accuracy.
- Calculations were spot-checked and verified.

One laboratory method blank was associated with the PFAS analyses in this SDG. The laboratory method blank was non-detect for all target PFAS analytes.

One field blank was associated with the samples in this SDG. The field blank was non-detect for all target PFAS analytes.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All results for explosives for the samples in this SDG were considered usable. Therefore, the completeness for the PFAS portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

COMPARABILITY

All data was generated using contract-specific standard methods and reported with known data quality, type of analysis, units, etc.

SENSITIVITY

The LOD and LOQ values reported for the samples were compared to those listed in the QAPP to ensure that sensitivity requirements were met. Sample LODs and LOQs were adjusted based on dilution and/or initial/final volumes.

The LOD and LOQ values were below the project action limit (PAL) listed in the QAPP for all target PFAS.

DATA USABILITY

The purpose of this data validation report is to ensure the integrity and reliability of analytical laboratory data. The data quality is evaluated based on precision, accuracy, representativeness, comparability, and completeness (PARCC) characteristics of the data. The validated data indicated that the laboratory correctly performed the analyses. Based on the data quality assessment, no results were rejected. Although minor QC exceedances were identified for this data set, all data is considered usable for the purposes of this project.

DATA QUALIFIER CHANGES

There were no data qualifiers added, removed, or changed as a result of the data validation process.

DATA QUALIFIER DEFINITIONS

The data qualifiers are defined in Table 36.2 of the project-specific UFP-QAPP, as follows:

R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified. The data is unusable.

J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected. However, the reported LOD is approximate and may or may not accurately and precisely represent the concentration necessary to detect the analyte in the sample.
U	Analyte was not detected and is reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.

REASON CODE DEFINITIONS

Reason codes were used to document the logic behind all data validation qualifiers. The following reason codes for data qualification were associated with the samples in this SDG:

None

DATA VALIDATION SUMMARY REPORT

for samples collected from

BURLINGTON AIR NATIONAL GUARD BASE

SOUTH BURLINGTON, VERMONT

Data Validation by: Beth Driskill

Report Date: September 20, 2019

Parsons - Austin

INTRODUCTION

The following data validation summary report covers ten (10) sediment samples, ten (10) water samples, and one (1) field blank (FB). The samples were collected from Burlington Air National Guard (ANG) Base in South Burlington, Vermont on June 13, 2019. The samples were logged under the following Sample Delivery Group (SDG):

2049209

The samples in this SDG were analyzed for per- and polyfluoroalkyl substances (PFAS) by U.S. EPA Method 537 modified. The following table details the samples included in this SDG and the analytical parameters performed. The field quality control (QC) samples associated with the samples in this SDG include two field duplicates (FD), two sets of matrix spike (MS)/matrix spike duplicates (MSD), and one field blank (FB). No equipment blank or source blank samples are associated with the samples in this SDG since the field samples were collected using disposable or dedicated equipment. Percent moisture was determined for all sediment samples.

All samples were collected by Parsons and were hand delivered on ice to Eurofins TestAmerica (TA) in South Burlington, Vermont in two coolers on June 14, 2019. TA-Burlington then shipped the samples to Eurofins Lancaster Laboratories Environmental (ELLE). The planning documents for this site originally indicated the samples would be analyzed by TestAmerica in Sacramento, California (TA-Sacramento). However, upon initiation of the project, TA-Sacramento did not have sufficient capacity to meet the requirements of the project and therefore, the work was transferred to ELLE. ELLE performed all analyses related to this project. The samples were received by ELLE in good condition and at acceptable temperatures of 2.2 and 1.8 degrees Celsius.

All samples were prepared and analyzed following the procedures outlined in the project-specific Uniform Federal Policy - Quality Assurance Project Plan (UFP-QAPP) and the Department of Defense (DoD) Quality Systems Manual (QSM) Version 5.1.

SAMPLE IDs AND REQUESTED PARAMETERS

Sample ID	Matrix	COMMENTS
BRLTNDG-013-SW	Water	
BRLTNDG-009-SW	Water	

Sample ID	Matrix	COMMENTS
BRLTNDG-010-SW	Water	MS/MSD
BRLTNDG-008-SW	Water	
BRLTNDG-908-SW	Water	FD of BRLTNDG-008-SW
BRLTNDG-001-SW	Water	
BRLTNDG-005-SW	Water	
BRLTNDG-003-SW	Water	
BRLTNDG-004-SW	Water	
BRLTNDG-006-SW	Water	
BRLTN-061319-FB	Water	Field blank
BRLTNDG-013-SD-0.0-0.5	Sediment	
BRLTNDG-009-SD-0.0-0.5	Sediment	
BRLTNDG-010-SD-0.0-0.5	Sediment	MS/MSD
BRLTNDG-008-SD-0.0-0.5	Sediment	
BRLTNDG-908-SD-0.0-0.5	Sediment	FD of BRLTNDG-008-SD-0.0-0.5
BRLTNDG-001-SD-0.0-0.5	Sediment	
BRLTNDG-005-SD-0.0-0.5	Sediment	
BRLTNDG-003-SD-0.0-0.5	Sediment	
BRLTNDG-004-SD-0.0-0.5	Sediment	
BRLTNDG-006-SD-0.0-0.5	Sediment	

EXTRACTION, ANALYTICAL, AND REPORTING DETAILS

Parameter	Matrix	Prep Method	Analytical Method	Units
PFAS	Sediment	EPA 537 Modified	EPA 537 Modified*	ng/g
PFAS	Water	EPA 537 Modified	EPA 537 Modified*	ng/l

Note: PFAS units for sediment in the QAPP are in ug/kg (ppb). Lab reported sediments in units of ng/g (ppb).

* PFAS by LC/MS/MS Compliant with QSM 5.1 Table B-15

EVALUATION CRITERIA

The Level IV data package submitted by the laboratory has been reviewed and verified following the guidelines outlined in the project-specific UFP-QAPP and DoD QSM 5.1. Data qualification was performed following the spirit of the National Functional Guidelines for Organic Data Review even though this document does not specifically include the method for PFAS.

Information reviewed in the data packages included sample results; field and laboratory quality control results; instrument calibration; calibration verifications; case narratives;

sample receipt forms, and chain-of-custody (COC) forms. The analyses and findings presented in this report are based on the reviewed information, and whether guidelines in the associated analytical method, DoD QSM and QAPP were met. It should be noted that the final approved QAPP for this project indicated TestAmerica Sacramento was the primary laboratory. However, due to capacity issues with the laboratory, all samples were sent to and analyzed by, ELLE. Therefore, the accuracy tolerances reported in the data packages do not match those listed in the project QAPP. Per the DOD QSM 5.1, statistically derived in-house tolerances should be used for PFAS analysis. As these tolerances differ between laboratories, the limits listed in the analytical reports from ELLE were used to evaluate accuracy.

External Injection Standard (EIS) responses were only used to qualify data when the recovery was excessively high or excessively low. Data associated with EIS recoveries below 10% or above 190% were rejected. Data associated with EIS recoveries below 20% but at or above 10%, or above 180% but at or below 190%, were qualified "J" as estimated. At these extremes, the associated sample data were considered impacted and estimated, or significantly impacted and rejected. Data associated with EIS recoveries between 20% and 180% were not considered significantly impacted and no data qualifiers were applied for EIS recoveries within this range.

A table detailing the data qualifiers applied, removed, or changed for the samples in this SDG as a result of the data validation process is included at the end of this report.

PFAS

General

The PFAS portion of this SDG consisted of twenty-one (21) samples, including ten (10) environmental sediment samples, ten (10) environmental water samples, and one (1) FB. The samples were collected on June 13, 2019 and were analyzed for the following target list of 24 PFAS compounds as specified in the project-specific UFP-QAPP.

Analyte	CAS Number
Perfluorobutanoic acid (PFBA)	375-22-4
Perfluoropentanoic acid (PFPeA)	2706-90-3
Perfluorohexanoic acid (PFHxA)	307-24-4
Perfluoroheptanoic acid (PFHpA)	375-85-9
Perfluorooctanoic acid (PFOA)	335-67-1
Perfluorononanoic acid (PFNA)	375-95-1
Perfluorodecanoic acid (PFDA)	335-76-2
Perfluoroundecanoic acid (PFUnA)	2058-94-8
Perfluorododecanoic acid (PFDoA)	307-55-1
Perfluorotridecanoic acid (PFTriA)	72629-94-8
Perfluorotetradecanoic acid (PFTeA)	376-06-7
Perfluorobutanesulfonic acid (PFBS)	375-73-5
Perfluorohexanesulfonic acid (PFHxS)	355-46-4

Analyte	CAS Number
Perfluoroheptanesulfonic acid (PFHpS)	375-92-8
Perfluorooctanesulfonic acid (PFOS)	1763-23-1
Perfluorodecanesulfonic acid (PFDS)	335-77-3
Perfluorooctane sulfonamide (PFOSA)	754-91-6
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	2991-50-6
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	2355-31-9
1H,1H,2H,2H-perfluorooctane sulfonate (6:2 FTS)	27619-97-2
1H,1H,2H,2H-perfluorodecane sulfonate (8:2 FTS)	39108-34-4
1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2 FTS)	757124-72-4
Perflouro-1-nonanesulfonate (PFNS)	68259-12-1
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4

The PFAS analyses were performed in accordance with U.S. EPA Method 537 Modified (PFAS by LC/MS/MS Compliant with QSM 5.1 Table B-15). All samples in this SDG were analyzed following the procedures outlined in the DoD QSM, version 5.1 and the project-specific UFP-QAPP with exception of the previously noted accuracy tolerances.

The sediment samples were prepared one day outside the 14-day holding time required in the project-specific UFP-QAPP. However, EPA recently released a draft version of SW-846 Method 8327 for the analysis of PFAS. In this soon to be finalized method, the holding time for sediments is 28 days. Therefore, data quality of the sediment samples is not impacted, and results were not qualified. The water samples were analyzed within the 14-day holding time listed in the project-specific UFP-QAPP.

The samples were prepared and analyzed in two batches. The samples were analyzed on one instrument under two initial calibrations (ICALs). All the water matrix samples were reanalyzed due to QC related deficiencies. The laboratory reported the most compliant run for each sample. Only the final reported analyses and the associated QC are discussed in this report.

Accuracy

Accuracy was evaluated using the percent recovery (%R) obtained from the laboratory control sample (LCS), LCS duplicate (LCSD) if analyzed, MS/MSD, the Extracted Internal Standards (EIS), and the Injection Internal Standards (IIS). It should be noted that the laboratory report occasionally references the EIS as surrogate standards. The following samples were designated for MS/MSD analysis on the COC: BRLTNDG-010-SW and BRLTNDG-010-SD-0.0-0.5.

All LCS and LCSD recoveries were within acceptance criteria, except as follows:

Batch # 19179012

Analyte	LCS %R	LCSD %R	Criteria
PFBA	172	148	79-146%

The results for PFBA in the samples associated with this LCS were all non-detect except in sample BRLTNDG-908-SD-0.0-0.5. The PFBA result for this sample was qualified "J" as estimated due to the potential high bias. Non-detect results were not affected and were not qualified.

Batch # 19176003

Analyte	LCS %R	Criteria
PFBA	141	84-135%
NMeFOSAA	138	53-136%
PFOSA	123	73-121%

The results for NMeFOSAA in the samples associated with this LCS were all non-detect. Therefore, data quality was not impacted, and no corrective action was necessary for this analyte. Detected results for PFBA and PFOSA in the samples associated with this LCS were qualified "J" as estimated due to the potential high bias.

All MS and MSD recoveries were within acceptance criteria except as follows.

Batch # 19179012 (BRLTNDG-010-SD)

Analyte	MS %R	MSD %R	Criteria
PFHxS	69	63	75-131%
PFOS	34	18	66-140%

The parent sample results for PFHxS and PFOS were qualified "J" as estimated due to the potential low bias.

Batch # 19176003 (BRLTNDG-010-SW)

Analyte	MS %R	MSD %R	Criteria
PFDS	128	150	69-124%
PFHxS	2191	1655	71-131%
PFHxA	47	29	80-137%
PFNS	137	150	71-121%
PFOS	8000	6207	54-139%
PFOA	197	144	83-138%
PFPeS	62	78	82-132%
PFPeA	21	58	75-138%

The following analytes were detected at a concentration greater than 4 times the spike amount, resulting in the anomalous recoveries: PFHxS, PFHxA, PFOS, PFOA, PFPeS, and PFPeA. Therefore, no corrective action was necessary for these six analytes. The parent sample was non-detect for PFDS. Therefore, data quality was not affected by the potential high bias and no corrective action was necessary. The result for PFNS was qualified "J" as estimated in the parent sample due to the potential high bias.

All IIS recoveries were within acceptance criteria.

All EIS recoveries were within acceptance criteria except as follows:

Sample ID	Dilution	EIS	%R	Criteria
BRLTNDG-009-SW	1x	13C2-PFDoDA	8	20-180%
BRLTNDG-001-SW	1x	13C2-PFDoDA	4	
BRLTNDG-003-SW	1x	13C2-PFDoDA	2	
BRLTNDG-009-SW	1x	13C2-PFTeDA	2	
BRLTNDG-001-SW	1x	13C2-PFTeDA	1	
BRLTNDG-005-SW	1x	13C2-PFTeDA	13	
BRLTNDG-003-SW	1x	13C2-PFTeDA	0	
BRLTNDG-004-SW	1x	13C2-PFTeDA	16	
BRLTNDG-009-SW	1x	13C7-PFUnDA	16	
BRLTNDG-001-SW	1x	13C7-PFUnDA	13	
BRLTNDG-003-SW	1x	13C7-PFUnDA	11	
BRLTNDG-009-SW	1x	13C8-PFOSA	18	

The native target compounds associated with the non-compliant EIS below 10% were qualified as rejected and flagged "R" in the samples noted above. The native target compounds associated with the non-compliant EIS below 20% but above 10% were qualified as estimated and flagged "UJ".

Precision

Precision was evaluated using the relative percent difference (RPD) obtained from the LCS/LCSD and MS/MSD analyte results. Precision was further evaluated by comparing the FD analyte results.

All LCS/LCSD RPDs were within acceptance criteria.

All MS/MSD RPDs were within acceptance criteria except as follows.

BRLTNDG-010-SW

Analyte	RPD	Criteria
PFTriA	32	RPD ≤ 30

The parent sample result was non-detect for PFTriA. Therefore, data quality was not affected, and no corrective action was necessary.

All field duplicate RPDs were within acceptance criteria except as follows.

BRLTNDG-008-SW/BRLTNDG-908-SW

Analyte	RPD	Criteria
PFHpS	40	RPD ≤ 30
PFOS	44.4	

The PFHpS and PFOS results in parent sample BRLTNDG-008-SW and associated field duplicate sample BRLTNDG-908-SW were qualified "J" as estimated due to the variability demonstrated.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the DoD QSM and project-specific UFP-QAPP;
- Comparing actual analytical procedures to those described in the DoD QSM and project-specific UFP-QAPP;
- Evaluating holding times; and
- Examining field and laboratory blanks for cross contamination of samples during collection and analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the DoD QSM and project-specific UFP-QAPP. All samples were prepared and analyzed within the holding time required by the method. The following QC elements were also evaluated:

- All ICAL criteria were met.
- All initial calibration verification (ICV) criteria were met.
- All continuing calibration verification (CCV) criteria were met.
- All instrument sensitivity check (ISC) criteria were met.
- Raw data was spot-checked for qualitative and quantitative accuracy.
- Calculations were spot-checked and verified.

Two laboratory method blanks were associated with the PFAS analyses in this SDG. The laboratory method blanks were non-detect for all target PFAS analytes.

One field blank was associated with the samples in this SDG. The field blank was non-detect for all target PFAS analytes except as follows:

Field Blank ID	Analyte	Conc. (ng/L)	LOQ (ng/L)
BRLTNDG-061319-FB	PFOS	0.52 J	1.7

Field blank results were reported in parts per trillion and sediment units were reported in parts per billion. Due to the magnitude of difference in results, the sediment sample results were not impacted by the low-level equipment blank contamination.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

Nine results for PFAS water samples in this SDG were qualified “R” as rejected and considered unusable. Therefore, the completeness for the PFAS water portion of this SDG is 96%, which meets the minimum acceptance criteria of 90%. The completeness for PFAS soil portion of this SDG is 100%.

COMPARABILITY

All data was generated using contract-specific standard methods and reported with known data quality, type of analysis, units, etc.

SENSITIVITY

The LOD and LOQ values reported for the samples were compared to those listed in the QAPP to ensure that sensitivity requirements were met. Sample LODs and LOQs were adjusted based on dilution and/or initial/final volumes.

The LOD and LOQ values were below the project action limit (PAL) listed in the QAPP for all target PFAS.

DATA USABILITY

The purpose of this data validation report is to ensure the integrity and reliability of analytical laboratory data. The data quality is evaluated based on precision, accuracy, representativeness, comparability, and completeness (PARCC) characteristics of the data. Nine PFAS results were qualified as rejected due to extreme exceedances in the associated EIS which causes those results to be unusable. Minor QC exceedances where data was qualified as estimated and flagged "J" are considered usable for the purposes of this project.

DATA QUALIFIER CHANGES

The following data qualifiers were added, removed, or changed as a result of the data validation process:

Sample ID	Analyte	Units	Original Result	Final Result	Reason Code
BRLTNDG-908-SD-0.0-0.5	PFBA	ng/g	1.1 J	1.1 J	L2
BRLTNDG-013-SW	PFBA	ng/l	59	59 J	L2
BRLTNDG-013-SW	PFOSA	ng/l	5.2	5.2 J	L2
BRLTNDG-009-SW	PFBA	ng/l	54	54 J	L2
BRLTNDG-010-SW	PFBA	ng/l	58	58 J	L2
BRLTNDG-010-SW	PFOSA	ng/l	4.3	4.3 J	L2
BRLTNDG-008-SW	PFBA	ng/l	260	260 J	L2
BRLTNDG-008-SW	PFOSA	ng/l	14 J	14 J	L2
BRLTNDG-908-SW	PFBA	ng/l	310	310 J	L2
BRLTNDG-908-SW	PFOSA	ng/l	17 J	17 J	L2
BRLTNDG-001-SW	PFBA	ng/l	34	34 J	L2
BRLTNDG-001-SW	PFOSA	ng/l	1.1 J	1.1 J	L2
BRLTNDG-005-SW	PFBA	ng/l	180	180 J	L2
BRLTNDG-003-SW	PFBA	ng/l	45	45 J	L2
BRLTNDG-003-SW	PFOSA	ng/l	28	28 J	L2
BRLTNDG-004-SW	PFBA	ng/l	63	63 J	L2

Sample ID	Analyte	Units	Original Result	Final Result	Reason Code
BRLTNDG-004-SW	PFOSA	ng/l	47	47 J	L2
BRLTNDG-006-SW	PFBA	ng/l	160	160 J	L2
BRLTNDG-010-SD-0.0-0.5	PFHxS	ng/g	0.80 J	0.80 J	M3
BRLTNDG-010-SD-0.0-0.5	PFOS	ng/g	1.8	1.8 J	M3
BRLTNDG-010-SW	PFNS	ng/l	0.89 J	0.89 J	M2
BRLTNDG-009-SW	PFDoA	ng/l	1.2 U	1.2 R	I12
BRLTNDG-009-SW	PFTriA	ng/l	1.2 U	1.2 R	I12
BRLTNDG-001-SW	PFDoA	ng/l	1.2 U	1.2 R	I12
BRLTNDG-001-SW	PFTriA	ng/l	1.2 U	1.2 R	I12
BRLTNDG-003-SW	PFDoA	ng/l	1.1 U	1.1 R	I12
BRLTNDG-003-SW	PFTriA	ng/l	1.1 U	1.1 R	I12
BRLTNDG-009-SW	PFTeA	ng/l	1.2 U	1.2 R	I12
BRLTNDG-001-SW	PFTeA	ng/l	1.2 U	1.2 R	I12
BRLTNDG-005-SW	PFTeA	ng/l	1.0 U	1.0 UJ	I12
BRLTNDG-003-SW	PFTeA	ng/l	1.1 U	1.1 R	I12
BRLTNDG-004-SW	PFTeA	ng/l	1.1 U	1.1 UJ	I12
BRLTNDG-009-SW	PFUnA	ng/l	1.2 U	1.2 UJ	I12
BRLTNDG-001-SW	PFUnA	ng/l	1.2 U	1.2 UJ	I12
BRLTNDG-003-SW	PFUnA	ng/l	1.1 U	1.1 UJ	I12
BRLTNDG-009-SW	PFOSA	ng/l	2.9 U	2.9 UJ	I12
BRLTNDG-008-SW	PFHpS	ng/l	280	280 J	D1
BRLTNDG-908-SW	PFHpS	ng/l	420	420 J	D1
BRLTNDG-008-SW	PFOS	ng/l	7,000	7,000 J	D1
BRLTNDG-908-SW	PFOS	ng/l	11,000	11,000 J	D1

DATA QUALIFIER DEFINITIONS

The data qualifiers are defined in Table 36.2 of the project-specific UFP-QAPP, as follows:

R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified. The data is unusable.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected. However, the reported LOD is approximate and may or may not accurately and precisely represent the concentration necessary to detect the analyte in the sample.

U	Analyte was not detected and is reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.

REASON CODE DEFINITIONS

Reason codes were used to document the logic behind all data validation qualifiers. The following reason codes for data qualification were associated with the samples in this SDG:

L2: LCS percent recovery Infraction with High Bias

I12: EIS percent recovery infraction with no assignable bias

M2: MS/MSD percent recovery Infraction with High Bias

M3: MS/MSD percent recovery Infraction with Low Bias

D1: Field Duplicate Precision Infraction

DATA VALIDATION SUMMARY REPORT

for samples collected from

BURLINGTON AIR NATIONAL GUARD BASE

SOUTH BURLINGTON, VERMONT

Data Validation by: Sandra de las Fuentes

Report Date: September 2, 2019

Parsons - Austin

INTRODUCTION

The following data validation summary report covers two (2) water samples, one (1) equipment blank (EB), and one (1) field blank (FB). The samples were collected from Burlington Air National Guard (ANG) Base in South Burlington, Vermont on June 14, 2019. The samples were logged under the following Sample Delivery Group (SDG):

2049211

The samples in this SDG were analyzed for per- and polyfluoroalkyl substances (PFAS) by U.S. EPA Method 537 modified. The following table details the sample IDs and requested parameters. The field quality control (QC) samples collected in association with this SDG was one EB, one FB, and one source blank (SB). The SB is not included in this SDG and can be found in SDG 2045561. The equipment blank was associated with both field samples in the SDG since the samples were collected using a non-dedicated, submersible pump.

All samples were collected by Parsons and were shipped by FedEx on June 14, 2019 to Eurofins Lancaster Laboratories Environmental (ELLE). The samples were received by ELLE in good condition and at an acceptable temperature of 1.4 degrees Celsius.

All samples were prepared and analyzed following the procedures outlined in the project-specific Uniform Federal Policy - Quality Assurance Project Plan (UFP-QAPP) and the Department of Defense (DoD) Quality Systems Manual (QSM) Version 5.1.

SAMPLE IDs AND REQUESTED PARAMETERS

Sample ID	Matrix	COMMENTS
V4-BR03-01	Water	
BRLTNDG-061419-EB	Water	EB for submersible pump tubing
BRLTNDG-061419-FB	Water	Field blank
V4-MW414-01	Water	

Note: All samples listed above were analyzed for the PFAS method listed in the table below.

EXTRACTION, ANALYTICAL, AND REPORTING DETAILS

Parameter	Matrix	Prep Method	Analytical Method	Units
PFAS	Water	EPA 537 Modified*	EPA 537 Modified*	ng/l

ng/l = nanogram per liter

* PFAS by LC/MS/MS Compliant with QSM 5.1 Table B-15

EVALUATION CRITERIA

The Level IV data package submitted by the laboratory has been reviewed and verified following the guidelines outlined in the project-specific UFP-QAPP and DoD QSM 5.1. Data qualification was performed following the spirit of the National Functional Guidelines for Organic Data Review even though this document does not specifically include the method for PFAS.

Information reviewed in the data packages included sample results; field and laboratory quality control results; instrument calibration; calibration verifications; case narratives; sample receipt forms, and chain-of-custody (COC) forms. The analyses and findings presented in this report are based on the reviewed information, and whether guidelines in the associated analytical method, DoD QSM and QAPP were met. It should be noted that the final approved QAPP for this project indicated TestAmerica Sacramento was the primary laboratory. However, due to capacity issues with the laboratory, all samples were sent to and analyzed by, ELLE. Therefore, the accuracy tolerances reported in the data packages do not match those listed in the project QAPP. Per the DOD QSM 5.1, statistically derived in-house tolerances should be used for PFAS analysis. As these tolerances differ between laboratories, the limits listed in the analytical reports from ELLE were used to evaluate accuracy.

External Injection Standard (EIS) responses were only used to qualify data when the recovery was excessively high or excessively low. Data associated with EIS recoveries below 10% or above 190% were rejected. Data associated with EIS recoveries below 20% but at or above 10%, or above 180% but at or below 190%, were qualified "J" as estimated. At these extremes, the associated sample data were considered impacted and estimated, or significantly impacted and rejected. Data associated with EIS recoveries between 120% and 180% were not considered significantly impacted and no data qualifiers were applied for EIS recoveries within this range.

A table detailing the data qualifiers applied, removed, or changed for the samples in this SDG as a result of the data validation process is included at the end of this report.

PFAS

General

The PFAS portion of this SDG consisted of four (4) samples, including two (2) environmental water samples, one (1) EB, and one (1) FB. The samples were collected on June 14, 2019 and were analyzed for the following target list of 24 PFAS compounds as specified in the project-specific UFP-QAPP.

Analyte	CAS Number
Perfluorobutanoic acid (PFBA)	375-22-4
Perfluoropentanoic acid (PFPeA)	2706-90-3
Perfluorohexanoic acid (PFHxA)	307-24-4
Perfluoroheptanoic acid (PFHpA)	375-85-9
Perfluorooctanoic acid (PFOA)	335-67-1
Perfluorononanoic acid (PFNA)	375-95-1
Perfluorodecanoic acid (PFDA)	335-76-2
Perfluoroundecanoic acid (PFUnA)	2058-94-8
Perfluorododecanoic acid (PFDoA)	307-55-1
Perfluorotridecanoic Acid (PFTriA)	72629-94-8
Perfluorotetradecanoic acid (PFTeA)	376-06-7
Perfluorobutanesulfonic acid (PFBS)	375-73-5
Perfluorohexanesulfonic acid (PFHxS)	355-46-4
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8
Perfluorooctanesulfonic acid (PFOS)	1763-23-1
Perfluorodecanesulfonic acid (PFDS)	335-77-3
Perfluorooctane Sulfonamide (PFOSA)	754-91-6
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	2991-50-6
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	2355-31-9
1H,1H,2H,2H-perfluorooctane sulfonate (6:2 FTS)	27619-97-2
1H,1H,2H,2H-perfluorodecane sulfonate (8:2 FTS)	39108-34-4
1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2 FTS)	757124-72-4
Perflouro-1-nonanesulfonate (PFNS)	68259-12-1
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4

The PFAS analyses were performed in accordance with U.S. EPA Method 537 Modified (PFAS by LC/MS/MS Compliant with QSM 5.1 Table B-15). All samples in this SDG were analyzed following the procedures outlined in the DoD QSM, version 5.1 and the project-specific UFP-QAPP with exception of the previously noted accuracy tolerances.

The samples were prepared and analyzed within the holding time required by the method. The samples were prepared and analyzed in one batch. The samples were analyzed on one instrument under one ICAL. Some of the samples were reanalyzed due to QC related deficiencies. The laboratory reported the most compliant run for each sample. Only the final reported analyses and the associated QC are discussed in this report.

Accuracy

Accuracy was evaluated using the percent recovery (%R) obtained from the laboratory control sample (LCS), the Extracted Internal Standard (EIS) analytes (also referred to as surrogates in the laboratory report), and Injection Internal Standards (IIS) analytes.

All LCS recoveries were within acceptance criteria.

All IIS analytes were within acceptance criteria.

All EIS analytes were within acceptance criteria.

Precision

Precision was not evaluated since there were no duplicate analysis associated with this SDG.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the DoD QSM and project QAPP;
- Comparing actual analytical procedures to those described in the DoD QSM and project-specific UFP-QAPP;
- Evaluating holding times; and
- Examining field and laboratory blanks for cross contamination of samples during collection and analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the DoD QSM and project-specific UFP-QAPP. All samples were prepared and analyzed within the holding time required by the method. The following QC elements were also evaluated:

- All initial calibration criteria were met.
- All initial calibration verification (ICV) criteria were met.
- All continuing calibration verification (CCV) criteria were met.
- All instrument sensitivity check (ISC) criteria were met.
- Raw data was spot-checked for qualitative and quantitative accuracy.
- Calculations were spot-checked and verified.

One laboratory method blank was associated with the PFAS analyses in this SDG. The laboratory method blank was non-detect for all target PFAS analytes.

The source blank was reported in SDG 2045561. The source blank consisted of onsite tap water used to rinse all reusable equipment. The source blank was non-detect for all target PFAS analytes except as follows:

Source Blank ID	Analyte	Conc. (ng/L)	LOQ (ng/L)
BRLTN-FDTAP-SB	PFBS	0.39 J	1.8
	PFHpA	0.58 J	1.8
	PFHxS	0.48 J	1.8
	PFHxA	0.79 J	1.8
	PFOSA	1.1 J	2.7
	PFOS	1.0 J	1.8
	PFOA	1.1 J	1.8

PFHxS in sample V4-MW414-01 was detected below the LOQ, therefore the result was changed to a non-detect at the LOQ.

The EB was associated with both samples in this SDG as they were collected using a non-dedicated, submersible pump. The equipment blank was non-detect for all target PFAS except as follows:

Equipment Blank ID	Analyte	Conc. (ng/L)	LOQ (ng/L)
BRLTN-061419-EB	PFOS	0.88 J	1.8

The results for PFOS in the associated water samples were either detected above the LOQ or were non-detect. Therefore, no corrective action was necessary.

One field blank was associated to the water samples in this SDG. The field blank was non-detect for all target PFAS analytes.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All results for explosives for the samples in this SDG were considered usable. Therefore, the completeness for the PFAS portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

COMPARABILITY

All data was generated using contract-specific standard methods and reported with known data quality, type of analysis, units, etc.

SENSITIVITY

The LOD and LOQ values reported for the samples were compared to those listed in the QAPP to ensure that sensitivity requirements were met. Sample LODs and LOQs were adjusted based on dilution and/or initial/final volumes.

The LOD and LOQ values were below the project action limit (PAL) listed in the QAPP for all target PFAS.

DATA USABILITY

The purpose of this data validation report is to ensure the integrity and reliability of analytical laboratory data. The data quality is evaluated based on precision, accuracy, representativeness, comparability, and completeness (PARCC) characteristics of the data. The validated data indicated that the laboratory correctly performed the analyses. Based on the data quality assessment, no results were rejected. Although minor QC exceedances were identified for this data set, all data is considered usable for the purposes of this project.

DATA QUALIFIER CHANGES

The following data qualifiers were added, removed, or changed as a result of the data validation process:

Sample ID	Analyte	Units	Original Result	Final Result	Reason Code
V4-MW414-01	PFHxS	ng/l	1.1 J	1.8 U	B9

DATA QUALIFIER DEFINITIONS

The data qualifiers are defined in Table 36.2 of the project-specific UFP-QAPP, as follows:

R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified. The data is unusable.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected. However, the reported LOD is approximate and may or may not accurately and precisely represent the concentration necessary to detect the analyte in the sample.
U	Analyte was not detected and is reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.

REASON CODE DEFINITIONS

Reason codes were used to document the logic behind all data validation qualifiers. The following reason codes for data qualification were associated with the samples in this SDG:

B9 – Source blank infraction (qualified detect)

DATA VALIDATION SUMMARY REPORT

for samples collected from

BURLINGTON AIR NATIONAL GUARD BASE

SOUTH BURLINGTON, VERMONT

Data Validation by: Sandra de las Fuentes

Report Date: September 2, 2019

Parsons - Austin

INTRODUCTION

The following data validation summary report covers three (3) water samples, one (1) equipment blank (EB), and three (3) field blanks (FB). The samples were collected from Burlington Air National Guard (ANG) Base in South Burlington, Vermont on June 15-17, 2019. The samples were logged under the following Sample Delivery Group (SDG):

2049443

The samples in this SDG were analyzed for per- and polyfluoroalkyl substances (PFAS) by U.S. EPA Method 537 modified. The following table details the sample IDs and requested parameters. The field quality control (QC) samples collected in association with this SDG included one EB, three FB, and one source blank (SB) sample. The SB was reported in SDG 2045561.

All samples were collected by Parsons and were shipped by FedEx on June 17, 2019 to Eurofins Lancaster Laboratories Environmental (ELLE). The samples were received by ELLE in good condition and at an acceptable temperature of 0.8 degrees Celsius.

All samples were prepared and analyzed following the procedures outlined in the project-specific Uniform Federal Policy - Quality Assurance Project Plan (UFP-QAPP) and the Department of Defense (DoD) Quality Systems Manual (QSM) Version 5.1.

SAMPLE IDs AND REQUESTED PARAMETERS

Sample ID	Matrix	COMMENTS
BRLTN03-MW01S-01	Water	
BRLTN-061519-FB	Water	Field blank
AASF06-MW-03S-01	Water	
BRLTN-061619-FB	Water	Field blank
BRLTN03-MW01D-01	Water	
BRLTN-061719-FB	Water	Field blank
BRLTN-061719-EB	Water	EB for submersible pump tubing; only applies to BRLTN03-MW01D-01

Note: All samples listed above were analyzed for the PFAS method listed in the table below.

EXTRACTION, ANALYTICAL, AND REPORTING DETAILS

Parameter	Matrix	Prep Method	Analytical Method	Units
PFAS	Water	EPA 537 Modified*	EPA 537 Modified*	ng/l

ng/l = nanogram per liter

* PFAS by LC/MS/MS Compliant with QSM 5.1 Table B-15

EVALUATION CRITERIA

The Level IV data package submitted by the laboratory has been reviewed and verified following the guidelines outlined in the project-specific UFP-QAPP and DoD QSM 5.1. Data qualification was performed following the spirit of the National Functional Guidelines for Organic Data Review even though this document does not specifically include the method for PFAS.

Information reviewed in the data packages included sample results; field and laboratory quality control results; instrument calibration; calibration verifications; case narratives; sample receipt forms, and chain-of-custody (COC) forms. The analyses and findings presented in this report are based on the reviewed information, and whether guidelines in the associated analytical method, DoD QSM and QAPP were met. It should be noted that the final approved QAPP for this project indicated TestAmerica Sacramento was the primary laboratory. However, due to capacity issues with the laboratory, all samples were sent to and analyzed by, ELLE. Therefore, the accuracy tolerances reported in the data packages do not match those listed in the project QAPP. Per the DOD QSM 5.1, statistically derived in-house tolerances should be used for PFAS analysis. As these tolerances differ between laboratories, the limits listed in the analytical reports from ELLE were used to evaluate accuracy.

External Injection Standard (EIS) responses were only used to qualify data when the recovery was excessively high or excessively low. Data associated with EIS recoveries below 10% or above 190% were rejected. Data associated with EIS recoveries below 20% but at or above 10%, or above 180% but at or below 190%, were qualified "J" as estimated. At these extremes, the associated sample data were considered impacted and estimated, or significantly impacted and rejected. Data associated with EIS recoveries between 20% and 180% were not considered significantly impacted and no data qualifiers were applied for EIS recoveries within this range.

A table detailing the data qualifiers applied, removed, or changed for the samples in this SDG as a result of the data validation process is included at the end of this report.

PFAS

General

The PFAS portion of this SDG consisted of seven (7) samples, including three (3) environmental water samples, one (1) EB, and three (3) FBs. The samples were collected on June 15-17, 2019 and were analyzed for the following target PFAS analytes as specified in the project-specific UFP-QAPP.

Analyte	CAS Number
Perfluorobutanoic acid (PFBA)	375-22-4
Perfluoropentanoic acid (PFPeA)	2706-90-3
Perfluorohexanoic acid (PFHxA)	307-24-4
Perfluoroheptanoic acid (PFHpA)	375-85-9
Perfluorooctanoic acid (PFOA)	335-67-1
Perfluorononanoic acid (PFNA)	375-95-1
Perfluorodecanoic acid (PFDA)	335-76-2
Perfluoroundecanoic acid (PFUnA)	2058-94-8
Perfluorododecanoic acid (PFDoA)	307-55-1
Perfluorotridecanoic Acid (PFTriA)	72629-94-8
Perfluorotetradecanoic acid (PFTeA)	376-06-7
Perfluorobutanesulfonic acid (PFBS)	375-73-5
Perfluorohexanesulfonic acid (PFHxS)	355-46-4
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8
Perfluorooctanesulfonic acid (PFOS)	1763-23-1
Perfluorodecanesulfonic acid (PFDS)	335-77-3
Perfluorooctane Sulfonamide (PFOSA)	754-91-6
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	2991-50-6
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	2355-31-9
1H,1H,2H,2H-perfluorooctane sulfonate (6:2 FTS)	27619-97-2
1H,1H,2H,2H-perfluorodecane sulfonate (8:2 FTS)	39108-34-4
1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2 FTS)	757124-72-4
Perflouro-1-nonanesulfonate (PFNS)	68259-12-1
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4

The PFAS analyses were performed in accordance with U.S. EPA Method 537 Modified (PFAS by LC/MS/MS Compliant with QSM 5.1 Table B-15). All samples in this SDG were analyzed following the procedures outlined in the DoD QSM, version 5.1 and the project-specific UFP-QAPP with exception of the previously noted accuracy tolerances.

The samples were prepared and analyzed within the holding time required by the method. The samples were prepared and analyzed in one batch. The samples were analyzed on one instrument under one initial calibration (ICAL). Some of the samples were reanalyzed due to QC related deficiencies. The laboratory reported the most compliant run for each sample. Only the final reported analyses and the associated QC are discussed in this report.

Accuracy

Accuracy was evaluated using the percent recovery (%R) obtained from the laboratory control sample (LCS), LCS Duplicate (LCSD), the Extracted Internal Standard (EIS)

analytes (also referred to as surrogates in the laboratory report), and the Injection Internal Standards (IIS).

All LCS and LCSD recoveries were within acceptance criteria except as follows:

Batch# 19170004

Analyte	LCS %R	LCSD %R	Criteria
NMeFOSAA	(130)	137	53-136
PFBA	139	139	84-135
PFNS	132	(121)	73-121
PFPeS	133	136	82-132

( ) indicates the recovery met criteria.

The results for PFBA and PFPeS were qualified "J" as estimated in samples BRLTN03-MW01S-01 and AASF06-MW03S due to the potential high bias. All other associated sample results were non-detect for the non-compliant compounds and therefore, data quality was not affected.

All IIS analytes were within acceptance criteria.

All EIS analytes were within acceptance criteria except as follows:

Sample ID	EIS	%R	Criteria
AASF06-MW-03S-01	13C2-4:2-FTS	184	20-180%
AASF06-MW-03S-01	13C2-PFTeDA	1	20-180%
BRLTN-061719-FB	13C2-PFTeDA	17	20-180%

The native target compound PFTeDA in sample AASF06-MW-03S-01 was qualified "R" as rejected due to the very low recovery. The native target compounds associated with the other non-complaint EIS noted in the table above were qualified as estimated ("J" if detected or "UJ" if non-detect) in the associated samples.

Precision

Precision could not be evaluated for this SDG as no duplicate analysis were performed.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the DoD QSM and project QAPP;
- Comparing actual analytical procedures to those described in the DoD QSM and project-specific UFP-QAPP;
- Evaluating holding times; and
- Examining field and laboratory blanks for cross contamination of samples during collection and analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the DoD QSM and project-specific UFP-QAPP. All samples were prepared and analyzed within the holding time required by the method. The following QC elements were also evaluated:

- All initial calibration criteria were met.
- All initial calibration verification (ICV) criteria were met.
- All continuing calibration verification (CCV) criteria were met.
- All instrument sensitivity check (ISC) criteria were met.
- Raw data was spot-checked for qualitative and quantitative accuracy.
- Calculations were spot-checked and verified.

One laboratory method blank was associated with the PFAS analyses in this SDG. The laboratory method blank was non-detect for all target PFAS analytes.

Source blank BRLTN-FDTAP-SB reported in SDG 2045561 was associated with sample BRLTN03-MW01D-01 in this SDG since this well was sampled using a non-dedicated submersible pump. The source blank sample consisted of onsite tap water used to rinse all reusable equipment. The source blank was non-detect for all target PFAS analytes except as follows:

Source Blank ID	Analyte	Conc. (ng/L)	LOQ (ng/L)
BRLTN-FDTAP-SB	PFBS	0.39 J	1.8
	PFHpA	0.58 J	1.8
	PFHxS	0.48 J	1.8
	PFHxA	0.79 J	1.8
	PFOSA	1.1 J	2.7
	PFOS	1.0 J	1.8
	PFOA	1.1 J	1.8

The result for PFHxS in BRLTN03-MW01D-01 was below the LOQ and changed to non-detect at the LOQ. No other field sample data was affected by the source blank detections.

The equipment blank sample was non-detect for all target PFAS analytes except PFOS was detected below the LOQ. PFOS was detected in BRLTN03-MW01D-01 above the LOQ, therefore no qualification was necessary.

Three field blanks were associated with the water samples in this SDG. The field blanks were non-detect for all target PFAS analytes.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

One result for PFAS for the samples in this SDG was qualified as rejected and flagged "R". Therefore, the completeness for the PFAS portion of this SDG is 99%, which meets the minimum acceptance criteria of 90%.

COMPARABILITY

All data was generated using contract-specific standard methods and reported with known data quality, type of analysis, units, etc.

SENSITIVITY

The LOD and LOQ values reported for the samples were compared to those listed in the QAPP to ensure that sensitivity requirements were met. Sample LODs and LOQs were adjusted based on dilution and/or initial/final volumes.

The LOD and LOQ values were below the project action limit (PAL) listed in the QAPP for all target PFAS.

DATA USABILITY

The purpose of this data validation report is to ensure the integrity and reliability of analytical laboratory data. The data quality is evaluated based on precision, accuracy, representativeness, comparability, and completeness (PARCC) characteristics of the data. One PFAS result was qualified as rejected due to extreme exceedances in the associated EIS which causes those results to be unusable. All other data is considered usable for the purposes of this project.

DATA QUALIFIER CHANGES

The following data qualifiers were added, removed, or changed as a result of the data validation process:

Sample ID	Analyte	Units	Original Result	Final Result	Reason Code
BRLTN03-MW01D-01	PFHxS	ng/l	0.75 J	1.8 U	B9
BRLTN03-MW01S-01	PFBA	ng/l	1100	1100 J	L2
BRLTN03-MW01S-01	PFPeS	ng/l	3500	3500 J	L2
AASF06-MW03S-01	PFBA	ng/l	82	82 J	L2
AASF06-MW03S-01	PFPeS	ng/l	2.4	2.4 J	L2
AASF06-MW03S-01	PFTeA	ng/l	1.1 U	1.1 R	I12
AASF06-MW03S-01	4:2-FTS	ng/l	1.8 U	1.8 UJ	I12
BRLTN-061719-FB	PFTeA	ng/l	1.0 U	1.0 UJ	I12

DATA QUALIFIER DEFINITIONS

The data qualifiers are defined in Table 36.2 of the project-specific UFP-QAPP, as follows:

R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified. The data is unusable.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected. However, the reported LOD is approximate and may or may not accurately and precisely represent the concentration necessary to detect the analyte in the sample.
U	Analyte was not detected and is reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.

REASON CODE DEFINITIONS

Reason codes were used to document the logic behind all data validation qualifiers. The following reason codes for data qualification were associated with the samples in this SDG:

B9: Source blank infraction (qualified detect)

I12: EIS percent recovery infraction with no assigned bias

L2: LCS percent recovery infraction with high bias

DATA VALIDATION SUMMARY REPORT

for samples collected from

BURLINGTON AIR NATIONAL GUARD BASE

SOUTH BURLINGTON, VERMONT

Data Validation by: Sandra de las Fuentes

Report Date: September 4, 2019

Parsons - Austin

INTRODUCTION

The following data validation summary report covers two (2) water samples, one (1) equipment blank (EB), and one (1) field blank (FB). The samples were collected from Burlington Air National Guard (ANG) Base in South Burlington, Vermont on June 18, 2019. The samples were logged under the following Sample Delivery Group (SDG):

2049610

The samples in this SDG were analyzed for per- and polyfluoroalkyl substances (PFAS) by U.S. EPA Method 537 modified. The following table details the sample IDs and requested parameters. The field quality control (QC) samples collected in association with this SDG was one EB, one FB, and one source blank (SB). The SB was reported in SDG 2045561. The equipment blank was associated with both field samples in this SDG since the samples were collected using a non-dedicated, submersible pump.

All samples were collected by Parsons and were shipped by FedEx on June 18, 2019 to Eurofins Lancaster Laboratories Environmental (ELLE). The samples were received by ELLE in good condition and at an acceptable temperature of 1.1 degrees Celsius.

All samples were prepared and analyzed following the procedures outlined in the project-specific Uniform Federal Policy - Quality Assurance Project Plan (UFP-QAPP) and the Department of Defense (DoD) Quality Systems Manual (QSM) Version 5.1.

SAMPLE IDs AND REQUESTED PARAMETERS

Sample ID	Matrix	COMMENTS
BRLTNDG-MW01D-01	Water	MS/MSD
BRLTNDG-MW01S-01	Water	
BRLTNDG-061819-EB	Water	EB for submersible pump tubing
BRLTNDG-061819-FB	Water	Field blank

Note: All samples listed above were analyzed for the PFAS method listed in the table below.

EXTRACTION, ANALYTICAL, AND REPORTING DETAILS

Parameter	Matrix	Prep Method	Analytical Method	Units
PFAS	Water	EPA 537 Modified*	EPA 537 Modified*	ng/l

ng/l = nanogram per liter

* PFAS by LC/MS/MS Compliant with QSM 5.1 Table B-15

EVALUATION CRITERIA

The Level IV data package submitted by the laboratory has been reviewed and verified following the guidelines outlined in the project-specific UFP-QAPP and DoD QSM 5.1. Data qualification was performed following the spirit of the National Functional Guidelines for Organic Data Review even though this document does not specifically include the method for PFAS.

Information reviewed in the data packages included sample results; field and laboratory quality control results; instrument calibration; calibration verifications; case narratives; sample receipt forms, and chain-of-custody (COC) forms. The analyses and findings presented in this report are based on the reviewed information, and whether guidelines in the associated analytical method, DoD QSM and QAPP were met. It should be noted that the final approved QAPP for this project indicated TestAmerica Sacramento was the primary laboratory. However, due to capacity issues with the laboratory, all samples were sent to and analyzed by, ELLE. Therefore, the accuracy tolerances reported in the data packages do not match those listed in the project QAPP. Per the DOD QSM 5.1, statistically derived in-house tolerances should be used for PFAS analysis. As these tolerances differ between laboratories, the limits listed in the analytical reports from ELLE were used to evaluate accuracy.

External Injection Standard (EIS) responses were only used to qualify data when the recovery was excessively high or excessively low. Data associated with EIS recoveries below 10% or above 190% were rejected. Data associated with EIS recoveries below 20% but at or above 10%, or above 180% but at or below 190%, were qualified "J" as estimated. At these extremes, the associated sample data were considered impacted and estimated, or significantly impacted and rejected. Data associated with EIS recoveries between 20% and 180% were not considered significantly impacted and no data qualifiers were applied for EIS recoveries within this range.

A table detailing the data qualifiers applied, removed, or changed for the samples in this SDG as a result of the data validation process is included at the end of this report.

PFAS

General

The PFAS portion of this SDG consisted of four (4) samples, including two (2) environmental water samples, one (1) EB, and one (1) FB. The samples were collected on June 18, 2019 and were analyzed for the following target list of 24 PFAS compounds as specified in the project-specific UFP-QAPP.

Analyte	CAS Number
Perfluorobutanoic acid (PFBA)	375-22-4
Perfluoropentanoic acid (PFPeA)	2706-90-3
Perfluorohexanoic acid (PFHxA)	307-24-4
Perfluoroheptanoic acid (PFHpA)	375-85-9
Perfluorooctanoic acid (PFOA)	335-67-1
Perfluorononanoic acid (PFNA)	375-95-1
Perfluorodecanoic acid (PFDA)	335-76-2
Perfluoroundecanoic acid (PFUnA)	2058-94-8
Perfluorododecanoic acid (PFDoA)	307-55-1
Perfluorotridecanoic Acid (PFTriA)	72629-94-8
Perfluorotetradecanoic acid (PFTeA)	376-06-7
Perfluorobutanesulfonic acid (PFBS)	375-73-5
Perfluorohexanesulfonic acid (PFHxS)	355-46-4
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8
Perfluorooctanesulfonic acid (PFOS)	1763-23-1
Perfluorodecanesulfonic acid (PFDS)	335-77-3
Perfluorooctane Sulfonamide (PFOSA)	754-91-6
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	2991-50-6
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	2355-31-9
1H,1H,2H,2H-perfluorooctane sulfonate (6:2 FTS)	27619-97-2
1H,1H,2H,2H-perfluorodecane sulfonate (8:2 FTS)	39108-34-4
1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2 FTS)	757124-72-4
Perflouro-1-nonanesulfonate (PFNS)	68259-12-1
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4

The PFAS analyses were performed in accordance with U.S. EPA Method 537 Modified (PFAS by LC/MS/MS Compliant with QSM 5.1 Table B-15). All samples in this SDG were analyzed following the procedures outlined in the DoD QSM, version 5.1 and the project-specific UFP-QAPP with exception of the previously noted accuracy tolerances.

The samples were prepared and analyzed within the holding time required by the method. The samples were prepared and analyzed in one batch. The samples were analyzed on one instrument under one ICAL. Some of the samples were reanalyzed due to QC related deficiencies. The laboratory reported the most compliant run for each sample. Only the final reported analyses and the associated QC are discussed in this report.

Accuracy

Accuracy was evaluated using the percent recovery (%R) obtained from the laboratory control sample (LCS), matrix spike (MS) matrix spike duplicate (MSD), the Extracted Internal Standard (EIS) analytes (also referred to as surrogates in the laboratory report),

and the Injection Internal Standards (IIS). Sample BRLTNDG-MW01D-01 was designated on the COC for MS/MSD analysis.

All LCS recoveries were within acceptance criteria.

All MS and MSD recoveries were within acceptance criteria except as follows:

Analyte	MS %R	MSD %R	Criteria
PFOSA	124	(121)	73-121%

( ) indicates the recovery met criteria

PFOSA recovered high in the MSD and was below the LOQ in the parent sample BRLTNDG-MW01D-01. However, the PFOSA result for the parent sample was changed to non-detect at the LOQ due to the associated source blank detection, as discussed in the Representativeness section below. Therefore, the parent sample result for PFOSA was considered non-detect and not affected by the potentially high bias.

All IIS recoveries were within acceptance criteria.

All EIS recoveries were within acceptance criteria except as follows:

Sample ID	EIS	%R	Criteria
BRLTNDG-MW01D-01	13C2-4:2-FTS	234	20-180%
BRLTNDG-061819-EB	13C2-4:2-FTS	216	
BRLTNDG-MW01S-01	13C2-PFTeDA	9	

The native target compounds associated with the non-compliant EIS were qualified as "R" as rejected in the samples noted above due to the very high and very low recoveries.

Precision

Precision was evaluated using the relative percent difference (RPD) obtained from the MS/MSD analyte results.

All MS/MSD RPDs were within acceptance criteria.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the DoD QSM and project QAPP;
- Comparing actual analytical procedures to those described in the DoD QSM and project-specific UFP-QAPP;
- Evaluating holding times; and
- Examining field and laboratory blanks for cross contamination of samples during collection and analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the DoD QSM and project-specific UFP-QAPP. All samples were prepared

and analyzed within the holding time required by the method. The following QC elements were also evaluated:

- All initial calibration criteria were met.
- All initial calibration verification (ICV) criteria were met.
- All continuing calibration verification (CCV) criteria were met.
- All instrument sensitivity check (ISC) criteria were met.
- Raw data was spot-checked for qualitative and quantitative accuracy.
- Calculations were spot-checked and verified.

One laboratory method blank was associated with the PFAS analyses in this SDG. The laboratory method blank was non-detect for all target PFAS analytes.

Source blank BRLTN-FDTAP-SB was reported SDG 2045561 and was associated with sample BRLTNDG-MW01D-01 and BRLTNDG-MW01S-01 since these wells were sampled using a non-dedicated submersible pump. The source blank sample consisted of onsite tap water used to rinse all reusable equipment and is also associated with equipment blank BRLTNDG-061819-EB. The source blank was non-detect for all target PFAS analytes except as follows:

Source Blank ID	Analyte	Conc. (ng/L)	LOQ (ng/L)
BRLTN-FDTAP-SB	PFBS	0.39 J	1.8
	PFHpA	0.58 J	1.8
	PFHxS	0.48 J	1.8
	PFHxA	0.79 J	1.8
	PFOSA	1.1 J	2.7
	PFOS	1.0 J	1.8
	PFOA	1.1 J	1.8

The PFOS result for BRLTNDG-MW01D-01 was below the LOQ and changed to non-detect at the LOQ. All other analytes were either non-detect or above the LOQ in the associated sample, so no additional corrective action was necessary.

BRLTNDG-061819-EB was associated with BRLTNDG-MW01D-01 and BRLTNDG-MW01S-01 and was non-detect for all target PFAS analytes.

One field blank was associated to the water samples in this SDG. The field blank was non-detect for all target PFAS analytes.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

One result for the samples in this SDG was qualified “R” as rejected and considered unusable. Therefore, the completeness for the PFAS portion of this SDG is 99%, which meets the minimum acceptance criteria of 90%.

COMPARABILITY

All data was generated using contract-specific standard methods and reported with known data quality, type of analysis, units, etc.

SENSITIVITY

The LOD and LOQ values reported for the samples were compared to those listed in the QAPP to ensure that sensitivity requirements were met. Sample LODs and LOQs were adjusted based on dilution and/or initial/final volumes.

The LOD and LOQ values were below the project action limit (PAL) listed in the QAPP for all target PFAS.

DATA USABILITY

The purpose of this data validation report is to ensure the integrity and reliability of analytical laboratory data. The data quality is evaluated based on precision, accuracy, representativeness, comparability, and completeness (PARCC) characteristics of the data. One PFAS result was qualified as rejected due to extreme exceedances in the associated EIS which causes those results to be unusable. All other data is considered usable for the purposes of this project.

DATA QUALIFIER CHANGES

The following data qualifiers were added, removed, or changed as a result of the data validation process:

Sample ID	Analyte	Units	Original Result	Final Result	Reason Code
BRLTNDG-MW01D-01	4:2FTS	ng/l	1.8 U	1.8 UJ	I12
BRLTNDG-MW01D-01	PFOS	ng/l	1.1 J	1.8 U	B9
BRLTNDG-061819-EB	4:2FTS	ng/l	1.8 U	1.8 UJ	I12
BRLTNDG-MW01S-01	PFTeA	ng/l	1.1 U	1.1 R	I12

DATA QUALIFIER DEFINITIONS

The data qualifiers are defined in Table 36.2 of the project-specific UFP-QAPP, as follows:

R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified. The data is unusable.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected. However, the reported LOD is approximate and may or may not accurately and precisely represent the concentration necessary to detect the analyte in the sample.

U	Analyte was not detected and is reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.

REASON CODE DEFINITIONS

Reason codes were used to document the logic behind all data validation qualifiers. The following reason codes for data qualification were associated with the samples in this SDG:

B9 – Field blank infraction (qualified detect)

I12: EIS percent recovery infraction with no assigned bias

DATA VALIDATION SUMMARY REPORT

for samples collected from

BURLINGTON AIR NATIONAL GUARD BASE

SOUTH BURLINGTON, VERMONT

Data Validation by: Sandra de las Fuentes

Report Date: September 5, 2019

Parsons - Austin

INTRODUCTION

The following data validation summary report covers three (3) water samples and one (1) field blank (FB). The samples were collected from Burlington Air National Guard (ANG) Base in South Burlington, Vermont on June 19, 2019. The samples were logged under the following Sample Delivery Group (SDG):

2050034

The samples in this SDG were analyzed for per- and polyfluoroalkyl substances (PFAS) by U.S. EPA Method 537 modified. The following table details the samples included in this SDG and the analytical parameters performed. The field quality control (QC) samples collected in association with this SDG included one (1) field duplicate (FD) and one (1) FB. No equipment blank was associated with the samples in this SDG because the samples were collected from established wells with dedicated sampling equipment.

All samples were collected by Parsons and were shipped by FedEx on June 19, 2019 to Eurofins Lancaster Laboratories Environmental (ELLE). The samples were received by ELLE in good condition and at an acceptable temperature of 1.0 degrees Celsius.

All samples were prepared and analyzed following the procedures outlined in the project-specific Uniform Federal Policy - Quality Assurance Project Plan (UFP-QAPP) and the Department of Defense (DoD) Quality Systems Manual (QSM) Version 5.1.

SAMPLE IDs AND REQUESTED PARAMETERS

Sample ID	Matrix	COMMENTS
BRLTN02-MW01D-01	Water	
BRLTN02-MW01D-91	Water	FD of BRLTN02-MW01D-01
BRLTN02-MW01S-01	Water	
BRLTN-061919-FB	Water	Field blank

Note: All samples listed above were analyzed for the PFAS method listed in the table below.

EXTRACTION, ANALYTICAL, AND REPORTING DETAILS

Parameter	Matrix	Prep Method	Analytical Method	Units
PFAS	Water	EPA 537 Modified*	EPA 537 Modified	ng/l

ng/l = nanogram per liter

*PFAS by LC/MS/MS compliant with QSM 5.1 Table B-15

EVALUATION CRITERIA

The Level IV data package submitted by the laboratory has been reviewed and verified following the guidelines outlined in the project-specific UFP-QAPP and DoD QSM 5.1. Data qualification was performed following the spirit of the National Functional Guidelines for Organic Data Review even though this document does not specifically include the method for PFAS.

Information reviewed in the data packages included sample results; field and laboratory quality control results; instrument calibration; calibration verifications; case narratives; sample receipt forms, and chain-of-custody (COC) forms. The analyses and findings presented in this report are based on the reviewed information, and whether guidelines in the associated analytical method, DoD QSM and QAPP were met. It should be noted that the final approved QAPP for this project indicated TestAmerica Sacramento was the primary laboratory. However, due to capacity issues with the laboratory, all samples were sent to and analyzed by, ELLE. Therefore, the accuracy tolerances reported in the data packages do not match those listed in the project QAPP. Per the DOD QSM 5.1, statistically derived in-house tolerances should be used for PFAS analysis. As these tolerances differ between laboratories, the limits listed in the analytical reports from ELLE were used to evaluate accuracy.

External Injection Standard (EIS) responses were only used to qualify data when the recovery was excessively high or excessively low. Data associated with EIS recoveries below 10% or above 190% were rejected. Data associated with EIS recoveries below 20% but at or above 10%, or above 180% but at or below 190%, were qualified "J" as estimated. At these extremes, the associated sample data were considered impacted and estimated, or significantly impacted and rejected. Data associated with EIS recoveries between 20% and 180% were not considered significantly impacted and no data qualifiers were applied for EIS recoveries within this range.

No data qualifiers applied, removed, or changed for the samples in this SDG as a result of the data validation process.

PFAS

General

The PFAS portion of this SDG consisted of four (4) samples, including three (3) environmental water samples and one (1) FB. The samples were collected on June 19, 2019 and were analyzed for the following target list of 24 PFAS analytes as specified in the project-specific UFP-QAPP.

Analyte	CAS Number
Perfluorobutanoic acid (PFBA)	375-22-4
Perfluoropentanoic acid (PFPeA)	2706-90-3
Perfluorohexanoic acid (PFHxA)	307-24-4
Perfluoroheptanoic acid (PFHpA)	375-85-9
Perfluorooctanoic acid (PFOA)	335-67-1
Perfluorononanoic acid (PFNA)	375-95-1
Perfluorodecanoic acid (PFDA)	335-76-2
Perfluoroundecanoic acid (PFUnA)	2058-94-8
Perfluorododecanoic acid (PFDoA)	307-55-1
Perfluorotridecanoic Acid (PFTriA)	72629-94-8
Perfluorotetradecanoic acid (PFTeA)	376-06-7
Perfluorobutanesulfonic acid (PFBS)	375-73-5
Perfluorohexanesulfonic acid (PFHxS)	355-46-4
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8
Perfluorooctanesulfonic acid (PFOS)	1763-23-1
Perfluorodecanesulfonic acid (PFDS)	335-77-3
Perfluorooctane Sulfonamide (PFOSA)	754-91-6
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	2991-50-6
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	2355-31-9
1H,1H,2H,2H-perfluorooctane sulfonate (6:2 FTS)	27619-97-2
1H,1H,2H,2H-perfluorodecane sulfonate (8:2 FTS)	39108-34-4
1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2 FTS)	757124-72-4
Perflouro-1-nonanesulfonate (PFNS)	68259-12-1
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4

The PFAS analyses were performed in accordance with U.S. EPA Method 537 Modified (PFAS by LC/MS/MS Compliant with QSM 5.1 Table B-15). All samples in this SDG were analyzed following the procedures outlined in the DoD QSM, version 5.1 and the project-specific UFP-QAPP with exception of the previously noted accuracy tolerances.

The samples were prepared and analyzed within the holding time required by the method. The samples were prepared and analyzed in one batch. The samples were analyzed on one instrument under one initial calibration (ICAL). Some of the samples were reanalyzed due to QC related deficiencies. The laboratory reported the most compliant run for each sample. Only the final reported analyses and the associated QC are discussed in this report.

Accuracy

Accuracy was evaluated using the percent recovery (%R) obtained from the laboratory control sample (LCS), the Extracted Internal Standard (EIS) analytes (also referred to as surrogates in the laboratory report), and the Injection Internal Standards (IIS).

All LCS recoveries were within acceptance criteria.

All IIS recoveries were within acceptance criteria except as follows:

IIS	Sample ID	%R	Criteria
13C4-PFOS	BRLTN02-MW01S-01	41	50-150%

Qualification of the data is not necessary since IIS recovery only impacts EIS response.

All EIS analytes were within acceptance criteria.

Precision

Precision was evaluated using the RPD obtained from the FD analyte results.

All parent/FD RPDs were within acceptance criteria.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the DoD QSM and project-specific UFP-QAPP;
- Comparing actual analytical procedures to those described in the DoD QSM and project-specific UFP-QAPP;
- Evaluating holding times; and
- Examining field and laboratory blanks for cross contamination of samples during collection and analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the DoD QSM and project-specific UFP-QAPP. All samples were prepared and analyzed within the holding time required by the method. The following QC elements were also evaluated:

- All ICAL criteria were met.
- All initial calibration verification (ICV) criteria were met.
- All continuing calibration verification (CCV) criteria were met, except the recovery for extraction standard d5-NEtFOSAA in the closing CCV analyzed on 7/1/19 at 3:38AM recovered high at 136% (acceptance criteria are 70-130%). Since all associated sample results were non-detect, no corrective action was necessary.
- All instrument sensitivity check (ISC) criteria were met.
- Raw data was spot-checked for qualitative and quantitative accuracy.
- Calculations were spot-checked and verified.

One laboratory method blank was associated with the PFAS analyses in this SDG. The laboratory method blank was non-detect for all target PFAS analytes.

One field blank was associated with the water samples in this SDG. The field blank was non-detect for all target PFAS analytes, except for PFOS. PFOS was detected below the LOQ in BRLTN061919-FB. All three associated samples had PFOS detections above the LOQ, therefore no corrective action was necessary.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All results for PFAS for the samples in this SDG were considered usable. Therefore, the completeness for the PFAS portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

COMPARABILITY

All data was generated using contract-specific standard methods and reported with known data quality, type of analysis, units, etc.

SENSITIVITY

The LOD and LOQ values reported for the samples were compared to those listed in the QAPP to ensure that sensitivity requirements were met. Sample LODs and LOQs were adjusted based on dilution and/or initial/final volumes.

The LOD and LOQ values were below the project action limit (PAL) listed in the QAPP for all target PFAS.

DATA USABILITY

The purpose of this data validation report is to ensure the integrity and reliability of analytical laboratory data. The data quality is evaluated based on precision, accuracy, representativeness, comparability, and completeness (PARCC) characteristics of the data. The validated data indicated that the laboratory correctly performed the analyses. Based on the data quality assessment, no results were rejected. Although minor QC exceedances were identified for this data set, all data is considered usable for the purposes of this project.

DATA QUALIFIER CHANGES

There were no data qualifiers were added, removed, or changed as a result of the data validation process.

DATA QUALIFIER DEFINITIONS

The data qualifiers are defined in Table 36.2 of the project-specific UFP-QAPP, as follows:

R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified. The data is unusable.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected. However, the reported LOD is approximate and may or may not accurately and precisely represent the concentration necessary to detect the analyte in the sample.
U	Analyte was not detected and is reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.

REASON CODE DEFINITIONS

Reason codes were used to document the logic behind all data validation qualifiers. The following reason codes for data qualification were associated with the samples in this SDG:

None

DATA VALIDATION SUMMARY REPORT

for samples collected from

BURLINGTON AIR NATIONAL GUARD BASE

SOUTH BURLINGTON, VERMONT

Data Validation by: Sandra de las Fuentes

Report Date: September 6, 2019

Parsons - Austin

INTRODUCTION

The following data validation summary report covers one (1) water samples and one (1) field blank (FB). The samples were collected from Burlington Air National Guard (ANG) Base in South Burlington, Vermont on June 25, 2019. The samples were logged under the following Sample Delivery Group (SDG):

2050790

The samples in this SDG were analyzed for per- and polyfluoroalkyl substances (PFAS) by U.S. EPA Method 537 modified. The following table details the sample IDs and requested parameters. The field quality control (QC) sample collected in association with this SDG was one FB. No equipment blank was associated with the sample in the SDG since the sample was collected using disposable equipment only.

All samples were collected by Parsons and were shipped by FedEx on June 25, 2019 to Eurofins Lancaster Laboratories Environmental (ELLE). The samples were received by ELLE in good condition and at an acceptable temperature of 1.5 degrees Celsius.

All samples were prepared and analyzed following the procedures outlined in the project-specific Uniform Federal Policy - Quality Assurance Project Plan (UFP-QAPP) and the Department of Defense (DoD) Quality Systems Manual (QSM) Version 5.1.

SAMPLE IDs AND REQUESTED PARAMETERS

Sample ID	Matrix	COMMENTS
AASF06-MW02S-01	Water	
BRLTN-062519-FB	Water	Field Blank

Note: All samples listed above were analyzed for the PFAS method listed in the table below.

EXTRACTION, ANALYTICAL, AND REPORTING DETAILS

Parameter	Matrix	Prep Method	Analytical Method	Units
PFAS	Water	EPA 537 Modified*	EPA 537 Modified*	ng/l

ng/l = nanogram per liter

* PFAS by LC/MS/MS Compliant with QSM 5.1 Table B-15

EVALUATION CRITERIA

The Level IV data package submitted by the laboratory has been reviewed and verified following the guidelines outlined in the project-specific UFP-QAPP and DoD QSM 5.1. Data qualification was performed following the spirit of the National Functional Guidelines for Organic Data Review even though this document does not specifically include the method for PFAS.

Information reviewed in the data packages included sample results; field and laboratory quality control results; instrument calibration; calibration verifications; case narratives; sample receipt forms, and chain-of-custody (COC) forms. The analyses and findings presented in this report are based on the reviewed information, and whether guidelines in the associated analytical method, DoD QSM and QAPP were met. It should be noted that the final approved QAPP for this project indicated TestAmerica Sacramento was the primary laboratory. However, due to capacity issues with the laboratory, all samples were sent to and analyzed by, ELLE. Therefore, the accuracy tolerances reported in the data packages do not match those listed in the project QAPP. Per the DOD QSM 5.1, statistically derived in-house tolerances should be used for PFAS analysis. As these tolerances differ between laboratories, the limits listed in the analytical reports from ELLE were used to evaluate accuracy.

External Injection Standard (EIS) responses were only used to qualify data when the recovery was excessively high or excessively low. Data associated with EIS recoveries below 10% or above 190% were rejected. Data associated with EIS recoveries below 20% but at or above 10%, or above 180% but at or below 190%, were qualified “J” as estimated. At these extremes, the associated sample data were considered impacted and estimated, or significantly impacted and rejected. Data associated with EIS recoveries between 20% and 180% were not considered significantly impacted and no data qualifiers were applied for EIS recoveries within this range.

A table detailing the data qualifiers applied, removed, or changed for the samples in this SDG as a result of the data validation process is included at the end of this report.

PFAS

General

The PFAS portion of this SDG consisted of two (2) samples, including one (1) environmental water sample and one (1) FB. The samples were collected on June 25, 2019 and were analyzed for the following target list of 24 PFAS compounds as specified in the project-specific UFP-QAPP.

Analyte	CAS Number
Perfluorobutanoic acid (PFBA)	375-22-4
Perfluoropentanoic acid (PFPeA)	2706-90-3
Perfluorohexanoic acid (PFHxA)	307-24-4
Perfluoroheptanoic acid (PFHpA)	375-85-9
Perfluorooctanoic acid (PFOA)	335-67-1
Perfluorononanoic acid (PFNA)	375-95-1
Perfluorodecanoic acid (PFDA)	335-76-2
Perfluoroundecanoic acid (PFUnA)	2058-94-8
Perfluorododecanoic acid (PFDoA)	307-55-1
Perfluorotridecanoic Acid (PFTriA)	72629-94-8
Perfluorotetradecanoic acid (PFTeA)	376-06-7
Perfluorobutanesulfonic acid (PFBS)	375-73-5
Perfluorohexanesulfonic acid (PFHxS)	355-46-4
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8
Perfluorooctanesulfonic acid (PFOS)	1763-23-1
Perfluorodecanesulfonic acid (PFDS)	335-77-3
Perfluorooctane Sulfonamide (PFOSA)	754-91-6
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	2991-50-6
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	2355-31-9
1H,1H,2H,2H-perfluorooctane sulfonate (6:2 FTS)	27619-97-2
1H,1H,2H,2H-perfluorodecane sulfonate (8:2 FTS)	39108-34-4
1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2 FTS)	757124-72-4
Perflouro-1-nonanesulfonate (PFNS)	68259-12-1
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4

The PFAS analyses were performed in accordance with U.S. EPA Method 537 Modified (PFAS by LC/MS/MS Compliant with QSM 5.1 Table B-15). All samples in this SDG were analyzed following the procedures outlined in the DoD QSM, version 5.1 and the project-specific UFP-QAPP with exception of the previously noted accuracy tolerances.

The samples were prepared and analyzed within the holding time required by the method. The samples were prepared and analyzed in a single batch. The samples were analyzed on one instrument under one initial calibration (ICAL). Some of the samples were reanalyzed due to QC related deficiencies. The laboratory reported the most compliant run for each sample. Only the final reported analyses and the associated QC are discussed in this report. It should be noted that both samples in this SDG were initially analyzed, but due to a laboratory analyst error, the data from these initial runs were unusable. Only results from the second analyses were used and discussed in this report.

Accuracy

Accuracy was evaluated using the percent recovery (%R) obtained from the laboratory control sample (LCS), the Extracted Internal Standard (EIS) analytes (also referred to as surrogates in the laboratory report), and the Injection Internal Standards (IIS).

All LCS recoveries were within acceptance criteria except as follows:

Batch # 19182014

Analyte	LCS %R	Criteria
PFDA	65	69-124%

The results for PFDA in the associated samples, AASF06-MW02S-01 and BRLTN-062519-FB, were non-detect and were qualified "UJ" as estimated due to the potential low bias.

All IIS recoveries were within acceptance criteria.

All EIS recoveries were within acceptance criteria.

Precision

Precision was not evaluated since there were no duplicate analyses involved with this SDG.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the DoD QSM and project QAPP;
- Comparing actual analytical procedures to those described in the DoD QSM and project-specific UFP-QAPP;
- Evaluating holding times; and
- Examining field and laboratory blanks for cross contamination of samples during collection and analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the DoD QSM and project-specific UFP-QAPP. All samples were prepared and analyzed within the holding time required by the method. The following QC elements were also evaluated:

- All initial calibration criteria were met.
- All initial calibration verification (ICV) criteria were met.
- All continuing calibration verification (CCV) criteria were met.
- All instrument sensitivity check (ISC) criteria were met.
- Raw data was spot-checked for qualitative and quantitative accuracy.
- Calculations were spot-checked and verified.

One laboratory method blank was associated with the PFAS analyses in this SDG. The laboratory method blank was non-detect for all target PFAS analytes.

One field blank was associated to the soil samples in this SDG. The field blank was non-detect for all target PFAS analytes.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All results for PFAS for the samples in this SDG were considered usable. Therefore, the completeness for the PFAS portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

COMPARABILITY

All data was generated using contract-specific standard methods and reported with known data quality, type of analysis, units, etc.

SENSITIVITY

The LOD and LOQ values reported for the samples were compared to those listed in the QAPP to ensure that sensitivity requirements were met. Sample LODs and LOQs were adjusted based on dilution and/or initial/final volumes.

The LOD and LOQ values were below the project action limit (PAL) listed in the QAPP for all target PFAS.

DATA USABILITY

The purpose of this data validation report is to ensure the integrity and reliability of analytical laboratory data. The data quality is evaluated based on precision, accuracy, representativeness, comparability, and completeness (PARCC) characteristics of the data. The validated data indicated that the laboratory correctly performed the analyses. Based on the data quality assessment, no results were rejected. Although minor QC exceedances were identified for this data set, all data is considered usable for the purposes of this project.

DATA QUALIFIER CHANGES

The following data qualifiers were added, removed, or changed as a result of the data validation process:

Sample ID	Analyte	Units	Original Result	Final Result	Reason Code
AASF06-MW02S-01	PFDA	ng/l	1.1 U	1.1 UJ	L3
BRLTN-062519-FB	PFDA	ng/l	1.0 U	1.0 UJ	L3

DATA QUALIFIER DEFINITIONS

The data qualifiers are defined in Table 36.2 of the project-specific UFP-QAPP, as follows:

R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified. The data is unusable.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected. However, the reported LOD is approximate and may or may not accurately and precisely represent the concentration necessary to detect the analyte in the sample.
U	Analyte was not detected and is reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.

REASON CODE DEFINITIONS

Reason codes were used to document the logic behind all data validation qualifiers. The following reason codes for data qualification were associated with the samples in this SDG:

L3: LCS percent recovery Infraction with Low Bias

DATA VALIDATION SUMMARY REPORT

for samples collected from

BURLINGTON AIR NATIONAL GUARD BASE

SOUTH BURLINGTON, VERMONT

Data Validation by: Sandra de las Fuentes

Report Date: September 9, 2019

Parsons - Austin

INTRODUCTION

The following data validation summary report covers fourteen (14) water samples and three (3) field blanks (FB). The samples were collected from Burlington Air National Guard (ANG) Base in South Burlington, Vermont on June 29-July 1, 2019. The samples were logged under the following Sample Delivery Group (SDG):

2051922

The samples in this SDG were analyzed for per- and polyfluoroalkyl substances (PFAS) by U.S. EPA Method 537 modified. The following table details the samples included in this SDG and the analytical parameters performed. The field quality control (QC) samples collected in association with this SDG included two (2) field duplicates (FD) and three (3) FBs. No equipment blank was associated with the samples in this SDG because the samples were collected from established wells with dedicated sampling equipment.

All samples were collected by Parsons and were shipped by FedEx on July 1, 2019 to Eurofins Lancaster Laboratories Environmental (ELLE). The samples were received by ELLE in good condition and at an acceptable temperature of 2.1 degrees Celsius.

All samples were prepared and analyzed following the procedures outlined in the project-specific Uniform Federal Policy - Quality Assurance Project Plan (UFP-QAPP) and the Department of Defense (DoD) Quality Systems Manual (QSM) Version 5.1.

SAMPLE IDs AND REQUESTED PARAMETERS

Sample ID	Matrix	COMMENTS
BRLTN-063019-FB	Water	Field blank
BRLTN04-MW01S-01	Water	
BRLTN04-MW01S-91	Water	FD of BRLTN04-MW01S-01
BTV-MW-5-02	Water	
BTV-MW-5-92	Water	FD of BTV-MW-5-02
BRLTN-062919-FB	Water	Field blank
MW-405-02	Water	
MW-401-02	Water	

Sample ID	Matrix	COMMENTS
MW-403-02	Water	
V1-MW-107-02	Water	
V1-MW14-02	Water	
V4-MW413-02	Water	
V4-MW-5-02	Water	
MW-105-02	Water	
Well59-02	Water	
AASF06-MW01S-01	Water	
BRLTN-070119-FB	Water	Field blank

Note: All samples listed above were analyzed for the PFAS method listed in the table below.

EXTRACTION, ANALYTICAL, AND REPORTING DETAILS

Parameter	Matrix	Prep Method	Analytical Method	Units
PFAS	Water	EPA 537 Modified*	EPA 537 Modified	ng/l

ng/l = nanogram per liter

*PFAS by LC/MS/MS compliant with QSM 5.1 Table B-15

EVALUATION CRITERIA

The Level IV data package submitted by the laboratory has been reviewed and verified following the guidelines outlined in the project-specific UFP-QAPP and DoD QSM 5.1. Data qualification was performed following the spirit of the National Functional Guidelines for Organic Data Review even though this document does not specifically include the method for PFAS.

Information reviewed in the data packages included sample results; field and laboratory quality control results; instrument calibration; calibration verifications; case narratives; sample receipt forms, and chain-of-custody (COC) forms. The analyses and findings presented in this report are based on the reviewed information, and whether guidelines in the associated analytical method, DoD QSM and QAPP were met. It should be noted that the final approved QAPP for this project indicated TestAmerica Sacramento was the primary laboratory. However, due to capacity issues with the laboratory, all samples were sent to and analyzed by, ELLE. Therefore, the accuracy tolerances reported in the data packages do not match those listed in the project QAPP. Per the DOD QSM 5.1, statistically derived in-house tolerances should be used for PFAS analysis. As these tolerances differ between laboratories, the limits listed in the analytical reports from ELLE were used to evaluate accuracy.

External Injection Standard (EIS) responses were only used to qualify data when the recovery was excessively high or excessively low. Data associated with EIS recoveries below 10% or above 190% were rejected. Data associated with EIS recoveries below 20% but at or above 10%, or above 180% but at or below 190%, were qualified “J” as estimated. At these extremes, the associated sample data were considered impacted and estimated, or significantly impacted and rejected. Data associated with EIS recoveries between 20% and

180% were not considered significantly impacted and no data qualifiers were applied for EIS recoveries within this range.

A table detailing the data qualifiers applied, removed, or changed for the samples in this SDG as a result of the data validation process is included at the end of this report.

PFAS

General

The PFAS portion of this SDG consisted of seventeen (17) samples, including twelve (12) environmental water samples, two (2) FDs and three (3) FBs. The samples were collected on June 29 - July 1, 2019 and were analyzed for the following target list of 24 PFAS analytes as specified in the project-specific UFP-QAPP.

Analyte	CAS Number
Perfluorobutanoic acid (PFBA)	375-22-4
Perfluoropentanoic acid (PFPeA)	2706-90-3
Perfluorohexanoic acid (PFHxA)	307-24-4
Perfluoroheptanoic acid (PFHpA)	375-85-9
Perfluorooctanoic acid (PFOA)	335-67-1
Perfluorononanoic acid (PFNA)	375-95-1
Perfluorodecanoic acid (PFDA)	335-76-2
Perfluoroundecanoic acid (PFUnA)	2058-94-8
Perfluorododecanoic acid (PFDoA)	307-55-1
Perfluorotridecanoic Acid (PFTriA)	72629-94-8
Perfluorotetradecanoic acid (PFTeA)	376-06-7
Perfluorobutanesulfonic acid (PFBS)	375-73-5
Perfluorohexanesulfonic acid (PFHxS)	355-46-4
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8
Perfluorooctanesulfonic acid (PFOS)	1763-23-1
Perfluorodecanesulfonic acid (PFDS)	335-77-3
Perfluorooctane Sulfonamide (PFOSA)	754-91-6
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	2991-50-6
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	2355-31-9
1H,1H,2H,2H-perfluorooctane sulfonate (6:2 FTS)	27619-97-2
1H,1H,2H,2H-perfluorodecane sulfonate (8:2 FTS)	39108-34-4
1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2 FTS)	757124-72-4
Perflouro-1-nonanesulfonate (PFNS)	68259-12-1
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4

The PFAS analyses were performed in accordance with U.S. EPA Method 537 Modified (PFAS by LC/MS/MS Compliant with QSM 5.1 Table B-15). All samples in this SDG were analyzed following the procedures outlined in the DoD QSM, version 5.1 and the project-specific UFP-QAPP with exception of the previously noted accuracy tolerances.

The samples were prepared and analyzed within the holding time required by the method. The samples were prepared and analyzed in two batches. The samples were analyzed on one instrument under one initial calibration (ICAL). Some of the samples were reanalyzed due to QC related deficiencies. The laboratory reported the most compliant run for each sample. Only the final reported analyses and the associated QC are discussed in this report.

Accuracy

Accuracy was evaluated using the percent recovery (%R) obtained from the laboratory control sample (LCS), the Extracted Internal Standard (EIS) analytes (also referred to as surrogates in the laboratory report) and the Injection Internal Standards (IIS).

All LCS recoveries were within acceptance criteria.

All IIS analytes were within acceptance criteria.

All EIS analytes were within acceptance criteria except as follows:

Sample ID	Dilution	EIS	%R	Criteria
BRLTN04-MW01S-01	1x	13C4-PFBA	7	20-180%
BRLTN04-MW01S-91	1x	13C4-PFBA	3	
MW-405-02	1x	13C8-PFOSA	15	

Non-compliant EIS were qualified as estimated (J/UJ) when the recovery was either less than 20% but above 10% and rejected (R) when the recoveries were below 10%.

Precision

Precision was evaluated using the RPD obtained from the FD analyte results.

All field duplicate RPDs were within acceptance criteria.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the DoD QSM and project-specific UFP-QAPP;
- Comparing actual analytical procedures to those described in the DoD QSM and project-specific UFP-QAPP;
- Evaluating holding times; and
- Examining field and laboratory blanks for cross contamination of samples during collection and analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the DoD QSM and project-specific UFP-QAPP. All samples were prepared

and analyzed within the holding time required by the method. The following QC elements were also evaluated:

- All ICAL criteria were met.
- All initial calibration verification (ICV) criteria were met.
- All continuing calibration verification (CCV) criteria were met.
- All instrument sensitivity check (ISC) criteria were met.
- Raw data was spot-checked for qualitative and quantitative accuracy.
- Calculations were spot-checked and verified.

Two laboratory method blanks were associated with the PFAS analyses in this SDG. The laboratory method blanks were non-detect for all target PFAS analytes.

Three field blanks were associated with the water samples in this SDG. The field blanks were non-detect for all target PFAS analytes.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

Two PFAS results for the samples in this SDG were qualified "R" as rejected and unusable. Therefore, the completeness for the PFAS portion of this SDG is 99.5%, which meets the minimum acceptance criteria of 90%.

COMPARABILITY

All data was generated using contract-specific standard methods and reported with known data quality, type of analysis, units, etc.

SENSITIVITY

The LOD and LOQ values reported for the samples were compared to those listed in the QAPP to ensure that sensitivity requirements were met. Sample LODs and LOQs were adjusted based on dilution and/or initial/final volumes.

The LOD and LOQ values were below the project action limit (PAL) listed in the QAPP for all target PFAS.

DATA USABILITY

The purpose of this data validation report is to ensure the integrity and reliability of analytical laboratory data. The data quality is evaluated based on precision, accuracy, representativeness, comparability, and completeness (PARCC) characteristics of the data. Two PFAS results were qualified as rejected due to extreme exceedances in the associated EIS which causes those results to be unusable. All other data is considered usable for the purposes of this project.

DATA QUALIFIER CHANGES

The following data qualifiers were added, removed, or changed as a result of the data validation process:

Sample ID	Analyte	Units	Original Result	Final Result	Reason Code
BRLTN04-MW01S-01	PFBA	ng/l	55	55 R	I12
BRLTN04-MW01S-91	PFBA	ng/l	47	47 R	I12
MW-405-02	PFOSA	ng/l	2.6 U	2.6 UJ	I12

DATA QUALIFIER DEFINITIONS

The data qualifiers are defined in Table 36.2 of the project-specific UFP-QAPP, as follows:

R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified. The data is unusable.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected. However, the reported LOD is approximate and may or may not accurately and precisely represent the concentration necessary to detect the analyte in the sample.
U	Analyte was not detected and is reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.

REASON CODE DEFINITIONS

Reason codes were used to document the logic behind all data validation qualifiers. The following reason codes for data qualification were associated with the samples in this SDG:

I12: EIS percent recovery infraction with no assignable bias

DATA VALIDATION SUMMARY REPORT

for samples collected from

BURLINGTON AIR NATIONAL GUARD BASE

SOUTH BURLINGTON, VERMONT

Data Validation by: Sandra de las Fuentes

Report Date: September 21, 2019

Parsons - Austin

INTRODUCTION

The following data validation summary report covers eight (8) water samples and one (1) field blank (FB). The samples were collected from Burlington Air National Guard (ANG) Base in South Burlington, Vermont on July 8, 2019. The samples were logged under the following Sample Delivery Group (SDG):

2052466

The samples in this SDG were analyzed for per- and polyfluoroalkyl substances (PFAS) by U.S. EPA Method 537 modified. The following table details the samples included in this SDG and the analytical parameters performed. The field quality control (QC) samples collected in association with this SDG included one (1) matrix spike / matrix spike duplicate (MS/MSD) pair, one (1) field duplicate (FD), and one (1) FB sample. No equipment blank was associated to the samples in this SDG because the samples were either collected with dedicated equipment or were surface waters that do not require equipment to collect.

All samples were collected by Parsons and shipped directly to Eurofins Lancaster Laboratories Environmental (ELLE) in two coolers. The planning documents for this site originally indicated the samples would be analyzed by TestAmerica in Sacramento, California (TA-Sacramento). However, upon initiation of the project, TA-Sacramento did not have sufficient capacity to meet the requirements of the project and therefore, the work was transferred to ELLE. ELLE performed all analyses related to this project. The samples were received by ELLE in good condition and at acceptable temperatures of 1.8 and 3.5 degrees Celsius.

All samples were prepared and analyzed following the procedures outlined in the project-specific Uniform Federal Policy - Quality Assurance Project Plan (UFP-QAPP) and the Department of Defense (DoD) Quality Systems Manual (QSM) Version 5.1.

SAMPLE IDs AND REQUESTED PARAMETERS

Sample ID	Matrix	COMMENTS
BRLTN-070819-FB	Water	Field blank
BRLTNDG-MW04S-01	Water	MS/MSD
BRLTNDG-018-SW	Water	

Sample ID	Matrix	COMMENTS
BRLTNDG-918-SW	Water	FD of BRLTNDG-018-SW
BRLTNDG-016-SW	Water	
BRLTNDG-023-SW	Water	
BRLTNUP-002-SW	Water	
BRLTNUP-003-SW	Water	
BRLTNUP-005-SW	Water	

Note: All samples listed above were analyzed for the PFAS method listed in the table below.

EXTRACTION, ANALYTICAL, AND REPORTING DETAILS

Parameter	Matrix	Prep Method	Analytical Method	Units
PFAS	Water	EPA 537 Modified*	EPA 537 Modified	ng/l

ng/l = nanogram per liter

*PFAS by LC/MS/MS compliant with QSM 5.1 Table B-15

EVALUATION CRITERIA

The Level IV data package submitted by the laboratory has been reviewed and verified following the guidelines outlined in the project-specific UFP-QAPP and DoD QSM 5.1. Data qualification was performed following the spirit of the National Functional Guidelines for Organic Data Review even though this document does not specifically include the method for PFAS.

Information reviewed in the data packages included sample results; field and laboratory quality control results; instrument calibration; calibration verifications; case narratives; sample receipt forms, and chain-of-custody (COC) forms. The analyses and findings presented in this report are based on the reviewed information, and whether guidelines in the associated analytical method, DoD QSM and QAPP were met. It should be noted that the final approved QAPP for this project indicated TestAmerica Sacramento was the primary laboratory. However, due to capacity issues with the laboratory, all samples were sent to and analyzed by, ELLE. Therefore, the accuracy tolerances reported in the data packages do not match those listed in the project QAPP. Per the DOD QSM 5.1, statistically derived in-house tolerances should be used for PFAS analysis. As these tolerances differ between laboratories, the limits listed in the analytical reports from ELLE were used to evaluate accuracy.

External Injection Standard (EIS) responses were only used to qualify data when the recovery was excessively high or excessively low. Data associated with EIS recoveries below 10% or above 190% were rejected. Data associated with EIS recoveries below 20% but at or above 10%, or above 180% but at or below 190%, were qualified "J" as estimated. At these extremes, the associated sample data were considered impacted and estimated, or significantly impacted and rejected. Data associated with EIS recoveries between 20% and 180% were not considered significantly impacted and no data qualifiers were applied for EIS recoveries within this range.

A table detailing the data qualifiers applied, removed, or changed for the samples in this SDG as a result of the data validation process is included at the end of this report.

PFAS

General

The PFAS portion of this SDG consisted of nine (9) samples, including eight (8) environmental water samples and one (1) FB. The samples were collected on July 8, 2019 and were analyzed for the following target list of 24 PFAS analytes as specified in the project-specific UFP-QAPP.

Analyte	CAS Number
Perfluorobutanoic acid (PFBA)	375-22-4
Perfluoropentanoic acid (PFPeA)	2706-90-3
Perfluorohexanoic acid (PFHxA)	307-24-4
Perfluoroheptanoic acid (PFHpA)	375-85-9
Perfluorooctanoic acid (PFOA)	335-67-1
Perfluorononanoic acid (PFNA)	375-95-1
Perfluorodecanoic acid (PFDA)	335-76-2
Perfluoroundecanoic acid (PFUnA)	2058-94-8
Perfluorododecanoic acid (PFDoA)	307-55-1
Perfluorotridecanoic Acid (PFTriA)	72629-94-8
Perfluorotetradecanoic acid (PFTeA)	376-06-7
Perfluorobutanesulfonic acid (PFBS)	375-73-5
Perfluorohexanesulfonic acid (PFHxS)	355-46-4
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8
Perfluorooctanesulfonic acid (PFOS)	1763-23-1
Perfluorodecanesulfonic acid (PFDS)	335-77-3
Perfluorooctane Sulfonamide (PFOSA)	754-91-6
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	2991-50-6
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	2355-31-9
1H,1H,2H,2H-perfluorooctane sulfonate (6:2 FTS)	27619-97-2
1H,1H,2H,2H-perfluorodecane sulfonate (8:2 FTS)	39108-34-4
1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2 FTS)	757124-72-4
Perflouro-1-nonanesulfonate (PFNS)	68259-12-1
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4

The PFAS analyses were performed in accordance with U.S. EPA Method 537 Modified (PFAS by LC/MS/MS Compliant with QSM 5.1 Table B-15). All samples in this SDG were analyzed following the procedures outlined in the DoD QSM, version 5.1 and the project-specific UFP-QAPP with exception of the previously noted accuracy tolerances.

The samples were prepared and analyzed within the holding time required by the method. The samples were prepared and analyzed in two batches. The samples were analyzed on one instrument under one initial calibration (ICAL). Some of the samples were reanalyzed due to QC related deficiencies. The laboratory reported the most compliant run for each sample. Only the final reported analyses and the associated QC are discussed in this report.

Accuracy

Accuracy was evaluated using the percent recovery (%R) obtained from the laboratory control sample (LCS), MS/MSD, the Extracted Internal Standard (EIS) analytes (also referred to as surrogates in the laboratory report), and Injection Internal Standard (IIS) analytes. Sample BRLTNDG-MW04S-01 was designated on the COC for MS/MSD analysis.

All LCS recoveries were within acceptance criteria except as follows:

Batch # 19193004

Analyte	LCS %R	Criteria
PFDA	125	69-124%

All associated sample results for the analyte listed above were non-detect. Therefore, data quality was not impacted by the potential high bias and no corrective action was necessary.

All LCS recoveries were within acceptance criteria except as follows:

Batch # 19197017

Analyte	LCS %R	Criteria
PFOA	65	73-121%
PFOS	140	54-139%

The only sample associated with this batch was BRLTNDG-018-SW. The sample result for PFOA was qualified "J" as estimated due to the potential low bias. Due to method blank contamination for PFOS, the PFOS result in this sample changed to non-detect at the LOQ. Therefore, no qualification was required for the non-compliant LCS recovery, as result would have been potentially biased high.

All MS and MSD recoveries were within acceptance criteria except as follows.

Analyte	MS %R	MSD %R	Criteria
PFBS	(119)	139	81-133%
PFOS	125	129	69-124%
PFHpS	142	148	80-129%
PFHxS	(116)	201	71-131%
PFHxA	139	158	80-137%
PFNS	124	131	71-121%

Analyte	MS %R	MSD %R	Criteria
PFOA	125	163	83-138%
PFPeS	161	168	82-132%

( ) indicates the recovery met criteria.

The analytes listed above were all recovered high. The parent sample concentrations for PFHxS, PFHxA and PFOA were significantly greater than (more than 4 times) the amount spiked, resulting in the anomalous recoveries. Therefore, no corrective action was necessary for these 3 analytes. PFNS was not detected in the parent sample, therefore corrective action was not necessary for the potential high bias. PFBS, PFHpS, PFOS and PFPeS were all qualified "J" as estimated in the parent sample due to the potential high bias.

All IIS recoveries were within acceptance criteria except as follows.

IIS	Sample ID	%R	Criteria
13C3-PFBA	BRLTNDG-MW04S-01	14	50-150%
	BRLTNDG-MW04S-01 MS	13	
	BRLTNDG-MW04S-01 MSD	13	

Qualification of the data is not necessary since IIS recovery only impacts EIS response.

All extracted IS analytes were within acceptance criteria except as follows:

Sample ID	EIS	%R	Criteria
BRLTNDG-MW04S-01	13C-PFBS	248	20-180%
BRLTNDG-MW04S-01 MS	13C-PFBS	244	
BRLTNDG-MW04S-01 MSD	13C-PFBS	254	
BRLTNUP-005-SW	13C2-PFDoA	10	
	13C2-PFTeA	1	
BRLTNDG-918-SW	13C2-PFTeA	6	
BRLTNDG-016-SW	13C2-PFTeA	3	

The native target compounds associated with the non-compliant EIS 13C2-PFDoA for sample BRLTNUP-005-SW were qualified "UJ" as estimated due to the 10% recovery. All other native target compounds associated with the non-compliant EIS above were qualified "R" as rejected due to the very high or very low recoveries. It should be noted that QC samples, such as the MS/MSD, are not qualified.

Precision

Precision was evaluated using the RPD obtained from the MS/MSD concentrations. Precision was further evaluated by comparing the field duplicate analyte results.

All MS/MSD RPDs were within acceptance criteria.

The RPD was calculated for all analytes detected above the LOQ in both the parent and field duplicate samples. All field duplicate RPDs were within acceptance criteria. It should be noted that 6:2-FTS was non-detect in the parent sample and was detected above the

LOQ in the field duplicate. Therefore, the results for 6:2-FTS were qualified "J" if detected or "UJ" if non-detect for the field duplicate pair due to the variability demonstrated.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the DoD QSM and project-specific UFP-QAPP;
- Comparing actual analytical procedures to those described in the DoD QSM and project-specific UFP-QAPP;
- Evaluating holding times; and
- Examining field and laboratory blanks for cross contamination of samples during collection and analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the DoD QSM and project-specific UFP-QAPP. All samples were prepared and analyzed within the holding time required by the method. The following QC elements were also evaluated:

- All ICAL criteria were met.
- All initial calibration verification (ICV) criteria were met.
- All continuing calibration verification (CCV) criteria were met.
- All instrument sensitivity check (ISC) criteria were met.
- Raw data was reviewed for qualitative and quantitative accuracy.
- Calculations were spot-checked and verified.

Two laboratory method blanks were associated with the PFAS analyses in this SDG. The laboratory method blanks were non-detect for all target PFAS analytes, except for the following:

Batch	Analyte	Conc. (ng/L)	LOQ (ng/L)
1919017	PFOS	2.1	2.0

The only sample associated with this method blank was BRLTNDG-018-SW. The PFOS result for this sample was changed to non-detect at the LOQ due to the method blank contamination.

One field blank was associated to the soil samples in this SDG. The field blank was non-detect for all target PFAS analytes.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

Five PFAS results for the samples in this SDG were qualified "R" as rejected and considered unusable. Therefore, the completeness for the PFAS portion of this SDG is 97%, which meets the minimum acceptance criteria of 90%.

COMPARABILITY

All data was generated using contract-specific standard methods and reported with known data quality, type of analysis, units, etc.

SENSITIVITY

The LOD and LOQ values reported for the samples were compared to those listed in the QAPP to ensure that sensitivity requirements were met. Sample LODs and LOQs were adjusted based on dilution and/or initial/final volumes.

The LOD and LOQ values were below the project action limit (PAL) listed in the QAPP for all target PFAS.

DATA USABILITY

The purpose of this data validation report is to ensure the integrity and reliability of analytical laboratory data. The data quality is evaluated based on precision, accuracy, representativeness, comparability, and completeness (PARCC) characteristics of the data. Four PFAS results were qualified as rejected due to extreme exceedances in the associated EIS which causes those results to be unusable. All other data is considered usable for the purposes of this project.

DATA QUALIFIER CHANGES

The following data qualifiers were added, removed, or changed as a result of the data validation process:

Sample ID	Analyte	Units	Original Result	Final Result	Reason Code
BRLTNDG-MW04S	PFBS	ng/l	10	10 R	M2, I12
BRLTNDG-MW04S	PFHpS	ng/l	0.61 J	0.61 J	M2
BRLTNDG-MW04S	PFOS	ng/l	18	18 J	M2
BRLTNDG-MW04S	PFPeS	ng/l	13	13 R	M2, I12
BRLTNDG-018-SW	6:2FTS	ng/l	1.9 U	1.9 UJ	D1
BRLTNDG-018-SW	PFOA	ng/l	0.81	0.81 J	L3
BRLTNDG-018-SW	PFOS	ng/l	1.7 JB	1.9 U	B4
BRLTNDG-918-SW	6:2FTS	ng/l	3.2	3.2 J	D1
BRLTNDG-918-SW	PFTeA	ng/l	1.1 U	1.1 R	I12
BRLTNDG-016-SW	PFTeA	ng/l	1.1 U	1.1 R	I12
BRLTNUP-005-SW	PFDoA	ng/l	1.1 U	1.1 UJ	I12

Sample ID	Analyte	Units	Original Result	Final Result	Reason Code
BRLTNUP-005-SW	PFTriA	ng/l	1.1 U	1.1 UJ	I12
BRLTNUP-005-SW	PFTeA	ng/l	1.1 U	1.1 R	I12

DATA QUALIFIER DEFINITIONS

The data qualifiers are defined in Table 36.2 of the project-specific UFP-QAPP, as follows:

R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified. The data is unusable.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected. However, the reported LOD is approximate and may or may not accurately and precisely represent the concentration necessary to detect the analyte in the sample.
U	Analyte was not detected and is reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.

REASON CODE DEFINITIONS

Reason codes were used to document the logic behind all data validation qualifiers. The following reason codes for data qualification were associated with the samples in this SDG:

B4: Method blank infraction (Qualified detect)

L3: LCS percent recovery infraction with low bias

M2: MS/MSD percent recovery infraction with high bias

D1: Field duplicate precision infraction

I12: EIS percent recovery infraction with no assignable bias

DATA VALIDATION SUMMARY REPORT

for samples collected from

BURLINGTON AIR NATIONAL GUARD BASE

SOUTH BURLINGTON, VERMONT

Data Validation by: Sandra de las Fuentes

Report Date: September 21, 2019

Parsons - Austin

INTRODUCTION

The following data validation summary report covers one (1) water sample. The sample was collected from Burlington Air National Guard (ANG) Base in South Burlington, Vermont on July 8, 2019. The samples were logged under the following Sample Delivery Group (SDG):

2052477

The sample in this SDG was analyzed for per- and polyfluoroalkyl substances (PFAS) by U.S. EPA Method 537 modified. The following table details the samples included in this SDG and the analytical parameters performed. The field quality control (QC) samples collected in association with this SDG included one (1) matrix spike/matrix spike duplicate (MS/MSD) pair. It should be noted that the field blank associated with the sample in this SDG was reported in SDG 2052466. No equipment blank was associated with the sample in this SDG because the sample was collected without using any equipment.

All samples were collected by Parsons and shipped directly to Eurofins Lancaster Laboratories Environmental (ELLE) in two coolers. The planning documents for this site originally indicated the samples would be analyzed by TestAmerica in Sacramento, California (TA-Sacramento). However, upon initiation of the project, TA-Sacramento did not have sufficient capacity to meet the requirements of the project and therefore, the work was transferred to ELLE. ELLE performed all analyses related to this project. The samples were received by ELLE in good condition and at acceptable temperatures of 1.8 and 3.5 degrees Celsius.

All samples were prepared and analyzed following the procedures outlined in the project-specific Uniform Federal Policy - Quality Assurance Project Plan (UFP-QAPP) and the Department of Defense (DoD) Quality Systems Manual (QSM) Version 5.1.

SAMPLE IDs AND REQUESTED PARAMETERS

Sample ID	Matrix	COMMENTS
BRLTN-017-SW	Water	MS/MSD

Note: All samples listed above were analyzed for the PFAS method listed in the table below.

EXTRACTION, ANALYTICAL, AND REPORTING DETAILS

Parameter	Matrix	Prep Method	Analytical Method	Units
PFAS	Water	EPA 537 Modified*	EPA 537 Modified	ng/l

ng/l = nanogram per liter

*PFAS by LC/MS/MS compliant with QSM 5.1 Table B-15

EVALUATION CRITERIA

The Level IV data package submitted by the laboratory has been reviewed and verified following the guidelines outlined in the project-specific UFP-QAPP and DoD QSM 5.1. Data qualification was performed following the spirit of the National Functional Guidelines for Organic Data Review even though this document does not specifically include the method for PFAS.

Information reviewed in the data packages included sample results; field and laboratory quality control results; instrument calibration; calibration verifications; case narratives; sample receipt forms, and chain-of-custody (COC) forms. The analyses and findings presented in this report are based on the reviewed information, and whether guidelines in the associated analytical method, DoD QSM and QAPP were met. It should be noted that the final approved QAPP for this project indicated TestAmerica Sacramento was the primary laboratory. However, due to capacity issues with the laboratory, all samples were sent to and analyzed by, ELLE. Therefore, the accuracy tolerances reported in the data packages do not match those listed in the project QAPP. Per the DOD QSM 5.1, statistically-derived in-house tolerances should be used for PFAS analysis. As these tolerances differ between laboratories, the limits listed in the analytical reports from ELLE were used to evaluate accuracy.

External Injection Standard (EIS) responses were only used to qualify data when the recovery was excessively high or excessively low. Data associated with EIS recoveries below 10% or above 190% were rejected. Data associated with EIS recoveries below 20% but at or above 10%, or above 180% but at or below 190%, were qualified "J" as estimated. At these extremes, the associated sample data were considered impacted and estimated, or significantly impacted and rejected. Data associated with EIS recoveries between 20% and 180% were not considered significantly impacted and no data qualifiers were applied for EIS recoveries within this range.

A table detailing the data qualifiers applied, removed, or changed for the samples in this SDG as a result of the data validation process is included at the end of this report.

PFAS

General

The PFAS portion of this SDG consisted of one (1) sample. The sample was collected on July 8, 2019 and was analyzed for the following target list of 24 PFAS analytes as specified in the project-specific UFP-QAPP.

Analyte	CAS Number
Perfluorobutanoic acid (PFBA)	375-22-4
Perfluoropentanoic acid (PFPeA)	2706-90-3
Perfluorohexanoic acid (PFHxA)	307-24-4
Perfluoroheptanoic acid (PFHpA)	375-85-9
Perfluorooctanoic acid (PFOA)	335-67-1
Perfluorononanoic acid (PFNA)	375-95-1
Perfluorodecanoic acid (PFDA)	335-76-2
Perfluoroundecanoic acid (PFUnA)	2058-94-8
Perfluorododecanoic acid (PFDoA)	307-55-1
Perfluorotridecanoic Acid (PFTriA)	72629-94-8
Perfluorotetradecanoic acid (PFTeA)	376-06-7
Perfluorobutanesulfonic acid (PFBS)	375-73-5
Perfluorohexanesulfonic acid (PFHxS)	355-46-4
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8
Perfluorooctanesulfonic acid (PFOS)	1763-23-1
Perfluorodecanesulfonic acid (PFDS)	335-77-3
Perfluorooctane Sulfonamide (PFOSA)	754-91-6
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	2991-50-6
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	2355-31-9
1H,1H,2H,2H-perfluorooctane sulfonate (6:2 FTS)	27619-97-2
1H,1H,2H,2H-perfluorodecane sulfonate (8:2 FTS)	39108-34-4
1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2 FTS)	757124-72-4
Perflouro-1-nonanesulfonate (PFNS)	68259-12-1
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4

The PFAS analyses were performed in accordance with U.S. EPA Method 537 Modified (PFAS by LC/MS/MS Compliant with QSM 5.1 Table B-15). All samples in this SDG were analyzed following the procedures outlined in the DoD QSM, version 5.1 and the project-specific UFP-QAPP with exception of the previously noted accuracy tolerances.

The samples were prepared and analyzed within the holding time required by the method. The samples were prepared and analyzed in one batch. The samples were analyzed on one instrument under one initial calibration (ICAL). Some of the samples were reanalyzed due to QC related deficiencies. The laboratory reported the most compliant run for each sample. Only the final reported analyses and the associated QC are discussed in this report.

Accuracy

Accuracy was evaluated using the percent recovery (%R) obtained from the laboratory control sample (LCS), the MS/MSD pair, the Extracted Internal Standard (EIS) analytes (also referred to as surrogates in the laboratory report), and Injection Internal Standard (IIS) analytes. Sample BRLTNDG-017-SW1 was designated on the COC for MS/MSD analysis.

All LCS recoveries were within acceptance criteria except as follows:

Batch # 19197017

Analyte	LCS %R	Criteria
PFOA	65	73-121%
PFOS	140	54-139%

The only sample associated with this batch was BRLTNDG-017-SW. The PFOA result in the associated sample was qualified "J" as estimated due to the potential low bias. Due to method blank contamination for PFOS, the sample result for PFOS was qualified as non-detect. Therefore, no qualification was required for the non-detect PFOS result in the sample as the result would have been potentially biased high.

All MS and MSD recoveries were within acceptance criteria, except as follows.

Analyte	MS %R	MSD %R	Criteria
PFBS	(100)	80	81-133%
PFHpA	(87)	74	80-140%
PFOS	(76)	62	73-121%
PFOA	(89)	75	83-138%

( ) indicates the recovery met criteria.

The parent sample results for PFBS, PFHpA, PFOS and PFOA were qualified "J" as estimated due to the potential low bias.

All IIS recoveries were within acceptance criteria.

Precision

Precision was evaluated using the RPD obtained from the MS/MSD analyte results.

All MS/MSD RPDs were within acceptance criteria, except for the following:

Analyte	RPD	Criteria
8:2 FTS	35	RPD ≤ 30
NMeFOSAA	31	

The parent sample was non-detect for both analytes. Therefore, data quality was not affected so no corrective action was necessary.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the DoD QSM and project-specific UFP-QAPP;
- Comparing actual analytical procedures to those described in the DoD QSM and project-specific UFP-QAPP;
- Evaluating holding times; and
- Examining field and laboratory blanks for cross contamination of samples during collection and analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the DoD QSM and project-specific UFP-QAPP. All samples were prepared and analyzed within the holding time required by the method. The following QC elements were also evaluated:

- All ICAL criteria were met.
- All initial calibration verification (ICV) criteria were met.
- All continuing calibration verification (CCV) criteria were met.
- All instrument sensitivity check (ISC) criteria were met.
- Raw data was reviewed for qualitative and quantitative accuracy.
- Calculations were spot-checked and verified.

One laboratory method blank was associated with the PFAS analyses in this SDG. The laboratory method blank was non-detect for all target PFAS analytes, except:

Batch	Analyte	Conc. (ng/L)	LOQ (ng/L)
1919017	PFOS	2.1	2.0

The only sample associated with this method blank was BRLTNDG-017-SW. The PFOS result for this sample was changed to non-detect at the concentration found due to the method blank contamination.

One field blank, BRLTN-070819-FB, from SDG 2052466 was associated with the water sample in this SDG. The field blank was non-detect for all target PFAS analytes.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All results for PFAS for the samples in this SDG were considered usable. Therefore, the completeness for the PFAS portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

COMPARABILITY

All data was generated using contract-specific standard methods and reported with known data quality, type of analysis, units, etc.

SENSITIVITY

The LOD and LOQ values reported for the samples were compared to those listed in the QAPP to ensure that sensitivity requirements were met. Sample LODs and LOQs were adjusted based on dilution and/or initial/final volumes.

The LOD and LOQ values were below the project action limit (PAL) listed in the QAPP for all target PFAS.

DATA USABILITY

The purpose of this data validation report is to ensure the integrity and reliability of analytical laboratory data. The data quality is evaluated based on precision, accuracy, representativeness, comparability, and completeness (PARCC) characteristics of the data. Four PFAS results were qualified as rejected due to extreme exceedances in the associated EIS which causes those results to be unusable. All other data is considered usable for the purposes of this project.

DATA QUALIFIER CHANGES

The following data qualifiers were added, removed, or changed as a result of the data validation process:

Sample ID	Analyte	Units	Original Result	Final Result	Reason Code
BRLTNDG-017-SW	PFBS	ng/l	1.1 J	1.1 J	M3
BRLTNDG-017-SW	PFHpA	ng/l	0.64 J	0.64 J	M3
BRLTNDG-017-SW	PFOA	ng/l	1.0 J	1.0 J	L3, M3
BRLTNDG-017-SW	PFOS	ng/l	2.5 B	2.5 UJ	B4, M3

DATA QUALIFIER DEFINITIONS

The data qualifiers are defined in Table 36.2 of the project-specific UFP-QAPP, as follows:

R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified. The data is unusable.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected. However, the reported LOD is approximate and may or may not accurately and precisely represent the concentration necessary to detect the analyte in the sample.
U	Analyte was not detected and is reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.

REASON CODE DEFINITIONS

Reason codes were used to document the logic behind all data validation qualifiers. The following reason codes for data qualification were associated with the samples in this SDG:

L3: LCS percent recovery infraction with low bias

M3: MS/MSD percent recovery infraction with low bias

B4: Method blank infraction (Qualified detect)

DATA VALIDATION SUMMARY REPORT

for samples collected from

BURLINGTON AIR NATIONAL GUARD BASE

SOUTH BURLINGTON, VERMONT

Data Validation by: Sandra de las Fuentes

Report Date: September 24, 2019

Parsons - Austin

INTRODUCTION

The following data validation summary report covers six (6) water samples and one (1) field blank (FB). The samples were collected from Burlington Air National Guard (ANG) Base in South Burlington, Vermont on July 9, 2019. The samples were logged under the following Sample Delivery Group (SDG):

2052838

The samples in this SDG were analyzed for per- and polyfluoroalkyl substances (PFAS) by U.S. EPA Method 537 modified. The following table details the samples included in this SDG and the analytical parameters performed. The field quality control (QC) samples collected in association with this SDG included one (1) field duplicate and one (1) FB.

All samples were collected by Parsons and shipped directly to Eurofins Lancaster Laboratories Environmental (ELLE) on July 9, 2019 in one cooler. The planning documents for this site originally indicated the samples would be analyzed by TestAmerica in Sacramento, California (TA-Sacramento). However, upon initiation of the project, TA-Sacramento did not have sufficient capacity to meet the requirements of the project and therefore, the work was transferred to ELLE. ELLE performed all analyses related to this project. The samples were received by ELLE in good condition and at an acceptable temperature of 1.0 degrees Celsius.

All samples were prepared and analyzed following the procedures outlined in the project-specific Uniform Federal Policy - Quality Assurance Project Plan (UFP-QAPP) and the Department of Defense (DoD) Quality Systems Manual (QSM) Version 5.1.

SAMPLE IDs AND REQUESTED PARAMETERS

Sample ID	Matrix	COMMENTS
BRLTNDG-019-SW	Water	
BRLTNDG-020-SW	Water	
BRLTNDG-021-SW	Water	
BRLTNDG-022-SW	Water	
BRLTNDG-015-SW	Water	
BRLTNDG-915-SW	Water	FD of BRLTNDG-015-SW

Sample ID	Matrix	COMMENTS
BRLTNDG-070919-FB	Water	Field blank

Note: All samples listed above were analyzed for the PFAS method listed in the table below.

EXTRACTION, ANALYTICAL, AND REPORTING DETAILS

Parameter	Matrix	Prep Method	Analytical Method	Units
PFAS	Water	EPA 537 Modified*	EPA 537 Modified	ng/l

ng/l = nanogram per liter

*PFAS by LC/MS/MS compliant with QSM 5.1 Table B-15

EVALUATION CRITERIA

The Level IV data package submitted by the laboratory has been reviewed and verified following the guidelines outlined in the project-specific UFP-QAPP and DoD QSM 5.1. Data qualification was performed following the spirit of the National Functional Guidelines for Organic Data Review even though this document does not specifically include the method for PFAS.

Information reviewed in the data packages included sample results; field and laboratory quality control results; instrument calibration; calibration verifications; case narratives; sample receipt forms, and chain-of-custody (COC) forms. The analyses and findings presented in this report are based on the reviewed information, and whether guidelines in the associated analytical method, DoD QSM and QAPP were met. It should be noted that the final approved QAPP for this project indicated TestAmerica Sacramento was the primary laboratory. However, due to capacity issues with the laboratory, all samples were sent to and analyzed by, ELLE. Therefore, the accuracy tolerances reported in the data packages do not match those listed in the project QAPP. Per the DOD QSM 5.1, statistically derived in-house tolerances should be used for PFAS analysis. As these tolerances differ between laboratories, the limits listed in the analytical reports from ELLE were used to evaluate accuracy.

External Injection Standard (EIS) responses were only used to qualify data when the recovery was excessively high or excessively low. Data associated with EIS recoveries below 10% or above 190% were rejected. Data associated with EIS recoveries below 20% but at or above 10%, or above 180% but at or below 190%, were qualified “J” as estimated. At these extremes, the associated sample data were considered impacted and estimated, or significantly impacted and rejected. Data associated with EIS recoveries between 20% and 180% were not considered significantly impacted and no data qualifiers were applied for EIS recoveries within this range.

A table detailing the data qualifiers applied, removed, or changed for the samples in this SDG as a result of the data validation process is included at the end of this report.

PFAS

General

The PFAS portion of this SDG consisted of seven (7) samples, including five (5) environmental water samples, one (1) FB and one (1) FD. The samples were collected on

July 12 through July 14, 2019 and were analyzed for the following target list of 24 PFAS analytes as specified in the project-specific UFP-QAPP.

Analyte	CAS Number
Perfluorobutanoic acid (PFBA)	375-22-4
Perfluoropentanoic acid (PFPeA)	2706-90-3
Perfluorohexanoic acid (PFHxA)	307-24-4
Perfluoroheptanoic acid (PFHpA)	375-85-9
Perfluorooctanoic acid (PFOA)	335-67-1
Perfluorononanoic acid (PFNA)	375-95-1
Perfluorodecanoic acid (PFDA)	335-76-2
Perfluoroundecanoic acid (PFUnA)	2058-94-8
Perfluorododecanoic acid (PFDoA)	307-55-1
Perfluorotridecanoic Acid (PFTriA)	72629-94-8
Perfluorotetradecanoic acid (PFTeA)	376-06-7
Perfluorobutanesulfonic acid (PFBS)	375-73-5
Perfluorohexanesulfonic acid (PFHxS)	355-46-4
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8
Perfluorooctanesulfonic acid (PFOS)	1763-23-1
Perfluorodecanesulfonic acid (PFDS)	335-77-3
Perfluorooctane Sulfonamide (PFOSA)	754-91-6
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	2991-50-6
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	2355-31-9
1H,1H,2H,2H-perfluorooctane sulfonate (6:2 FTS)	27619-97-2
1H,1H,2H,2H-perfluorodecane sulfonate (8:2 FTS)	39108-34-4
1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2 FTS)	757124-72-4
Perflouro-1-nonanesulfonate (PFNS)	68259-12-1
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4

The PFAS analyses were performed in accordance with U.S. EPA Method 537 Modified (PFAS by LC/MS/MS Compliant with QSM 5.1 Table B-15). All samples in this SDG were analyzed following the procedures outlined in the DoD QSM, version 5.1 and the project-specific UFP-QAPP with exception of the previously noted accuracy tolerances.

The samples were prepared and analyzed within the holding time required by the method. The samples were prepared and analyzed in one batch. The samples were analyzed on one instrument under one initial calibration (ICAL). Some of the samples were reanalyzed due to QC related deficiencies. The laboratory reported the most compliant run for each sample. Only the final reported analyses and the associated QC are discussed in this report.

Accuracy

Accuracy was evaluated using the percent recovery (%R) obtained from the laboratory control sample (LCS), the LCS duplicate (LCSD), the Extracted Internal Standard (EIS) analytes (also referred to as surrogates in the laboratory report), and Injection Internal Standard (IIS) analytes.

All LCS recoveries were within acceptance criteria except as follows:

Batch # 19197002

Analyte	LCS %R	LCSD %R	Criteria
PFOSA	66	68	73-121%

The results for the analyte listed above was non-detect in all associated samples. All sample results for PFOSA were qualified "UJ" as estimated due to the potential low bias.

All IIS recoveries were within acceptance criteria.

All extracted IS analytes were within acceptance criteria.

Precision

Precision was evaluated using the RPD obtained from the LCS/LCSD concentrations. Precision was further evaluated by comparing the field duplicate analyte results.

All LCS/LCSD RPDs were within acceptance criteria.

All field duplicate RPDs were within acceptance criteria.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the DoD QSM and project-specific UFP-QAPP;
- Comparing actual analytical procedures to those described in the DoD QSM and project-specific UFP-QAPP;
- Evaluating holding times; and
- Examining field and laboratory blanks for cross contamination of samples during collection and analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the DoD QSM and project-specific UFP-QAPP. All samples were prepared and analyzed within the holding time required by the method. The following QC elements were also evaluated:

- All ICAL criteria were met.
- All initial calibration verification (ICV) criteria were met.
- All continuing calibration verification (CCV) criteria were met.
- All instrument sensitivity check (ISC) criteria were met.

- Raw data was reviewed for qualitative and quantitative accuracy.
- Calculations were spot-checked and verified.

One laboratory method blank was associated with the PFAS analyses in this SDG. The laboratory method blank was non-detect for all target PFAS analytes.

One field blank was associated with the water samples in this SDG. The field blank was non-detect for all target PFAS analytes.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All results for PFAS for the samples in this SDG were considered usable. Therefore, the completeness for the PFAS portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

COMPARABILITY

All data was generated using contract-specific standard methods and reported with known data quality, type of analysis, units, etc.

SENSITIVITY

The LOD and LOQ values reported for the samples were compared to those listed in the QAPP to ensure that sensitivity requirements were met. Sample LODs and LOQs were adjusted based on dilution and/or initial/final volumes.

The LOD and LOQ values were below the project action limit (PAL) listed in the QAPP for all target PFAS.

DATA USABILITY

The purpose of this data validation report is to ensure the integrity and reliability of analytical laboratory data. The data quality is evaluated based on precision, accuracy, representativeness, comparability, and completeness (PARCC) characteristics of the data. The validated data indicated that the laboratory correctly performed the analyses. Based on the data quality assessment, no results were rejected. Although minor QC exceedances were identified for this data set, all data is considered usable for the purposes of this project.

DATA QUALIFIER CHANGES

The following data qualifiers were added, removed, or changed as a result of the data validation process:

Sample ID	Analyte	Units	Original Result	Final Result	Reason Code
BRLTNDG-019-SW	PFOSA	ng/l	0.89 U	0.89 UJ	L3
BRLTNDG-020-SW	PFOSA	ng/l	0.97 U	0.97 UJ	L3

Sample ID	Analyte	Units	Original Result	Final Result	Reason Code
BRLTNDG-021-SW	PFOSA	ng/l	0.93 U	0.93 UJ	L3
BRLTNDG-022-SW	PFOSA	ng/l	0.98 U	0.98 UJ	L3
BRLTNDG-015-SW	PFOSA	ng/l	0.91 U	0.91 UJ	L3
BRLTNDG-915-SW	PFOSA	ng/l	0.90 U	0.90 UJ	L3
BRLTNDG-070919-FB	PFOSA	ng/l	0.91 U	0.91 UJ	L3

DATA QUALIFIER DEFINITIONS

The data qualifiers are defined in Table 36.2 of the project-specific UFP-QAPP, as follows:

R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified. The data is unusable.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected. However, the reported LOD is approximate and may or may not accurately and precisely represent the concentration necessary to detect the analyte in the sample.
U	Analyte was not detected and is reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.

REASON CODE DEFINITIONS

Reason codes were used to document the logic behind all data validation qualifiers. The following reason codes for data qualification were associated with the samples in this SDG:

L3: LCS percent recovery infraction with low bias

DATA VALIDATION SUMMARY REPORT

for samples collected from

BURLINGTON AIR NATIONAL GUARD BASE

SOUTH BURLINGTON, VERMONT

Data Validation by: Sandra de las Fuentes

Report Date: September 24, 2019

Parsons - Austin

INTRODUCTION

The following data validation summary report covers eight (8) water samples and one (1) field blank (FB). The samples were collected from Burlington Air National Guard (ANG) Base in South Burlington, Vermont on July 9 and 10, 2019. The samples were logged under the following Sample Delivery Group (SDG):

2053046

The samples in this SDG were analyzed for per- and polyfluoroalkyl substances (PFAS) by U.S. EPA Method 537 modified. The following table details the samples included in this SDG and the analytical parameters performed. The field quality control (QC) samples collected in association with this SDG included one (1) field duplicate (FD) and two (2) FBs. The FB associated with the samples collected on July 9, 2019 was reported in SDG 2052838.

All samples were collected by Parsons and shipped directly to Eurofins Lancaster Laboratories Environmental (ELLE) on July 10, 2019 in one cooler. The planning documents for this site originally indicated the samples would be analyzed by TestAmerica in Sacramento, California (TA-Sacramento). However, upon initiation of the project, TA-Sacramento did not have sufficient capacity to meet the requirements of the project and therefore, the work was transferred to ELLE. ELLE performed all analyses related to this project. The samples were received by ELLE in good condition and at an acceptable temperature of 1.0 degrees Celsius.

All samples were prepared and analyzed following the procedures outlined in the project-specific Uniform Federal Policy - Quality Assurance Project Plan (UFP-QAPP) and the Department of Defense (DoD) Quality Systems Manual (QSM) Version 5.1.

SAMPLE IDs AND REQUESTED PARAMETERS

Sample ID	Matrix	COMMENTS
BRLTNDG-MW04D-01	Water	
BRLTNDG-MW05S-01	Water	
BRLTN-071019-FB	Water	Field blank
BRLTUP-MW01D-01	Water	

Sample ID	Matrix	COMMENTS
BRLTN03-MW01S-02	Water	
BRLTN02-MW01S-02	Water	
BRLTN02-MW01D-02	Water	
BRLTN02-MW01S-92	Water	FD of BRLTN02-MW01S-02
V1-MW1-02	Water	

Note: All samples listed above were analyzed for the PFAS method listed in the table below.

EXTRACTION, ANALYTICAL, AND REPORTING DETAILS

Parameter	Matrix	Prep Method	Analytical Method	Units
PFAS	Water	EPA 537 Modified*	EPA 537 Modified	ng/l

ng/l = nanogram per liter

*PFAS by LC/MS/MS compliant with QSM 5.1 Table B-15

EVALUATION CRITERIA

The Level IV data package submitted by the laboratory has been reviewed and verified following the guidelines outlined in the project-specific UFP-QAPP and DoD QSM 5.1. Data qualification was performed following the spirit of the National Functional Guidelines for Organic Data Review even though this document does not specifically include the method for PFAS.

Information reviewed in the data packages included sample results; field and laboratory quality control results; instrument calibration; calibration verifications; case narratives; sample receipt forms, and chain-of-custody (COC) forms. The analyses and findings presented in this report are based on the reviewed information, and whether guidelines in the associated analytical method, DoD QSM and QAPP were met. It should be noted that the final approved QAPP for this project indicated TestAmerica Sacramento was the primary laboratory. However, due to capacity issues with the laboratory, all samples were sent to and analyzed by, ELLE. Therefore, the accuracy tolerances reported in the data packages do not match those listed in the project QAPP. Per the DOD QSM 5.1, statistically derived in-house tolerances should be used for PFAS analysis. As these tolerances differ between laboratories, the limits listed in the analytical reports from ELLE were used to evaluate accuracy.

External Injection Standard (EIS) responses were only used to qualify data when the recovery was excessively high or excessively low. Data associated with EIS recoveries below 10% or above 190% were rejected. Data associated with EIS recoveries below 20% but at or above 10%, or above 180% but at or below 190%, were qualified “J” as estimated. At these extremes, the associated sample data were considered impacted and estimated, or significantly impacted and rejected. Data associated with EIS recoveries between 20% and 180% were not considered significantly impacted and no data qualifiers were applied for EIS recoveries within this range.

A table detailing the data qualifiers applied, removed, or changed for the samples in this SDG as a result of the data validation process is included at the end of this report.

PFAS

General

The PFAS portion of this SDG consisted of seven (7) samples, including five (5) environmental water samples, one (1) FB and one (1) FD. The samples were collected on July 9-10, 2019 and were analyzed for the following target list of 24 PFAS analytes as specified in the project-specific UFP-QAPP.

Analyte	CAS Number
Perfluorobutanoic acid (PFBA)	375-22-4
Perfluoropentanoic acid (PFPeA)	2706-90-3
Perfluorohexanoic acid (PFHxA)	307-24-4
Perfluoroheptanoic acid (PFHpA)	375-85-9
Perfluorooctanoic acid (PFOA)	335-67-1
Perfluorononanoic acid (PFNA)	375-95-1
Perfluorodecanoic acid (PFDA)	335-76-2
Perfluoroundecanoic acid (PFUnA)	2058-94-8
Perfluorododecanoic acid (PFDoA)	307-55-1
Perfluorotridecanoic Acid (PFTriA)	72629-94-8
Perfluorotetradecanoic acid (PFTeA)	376-06-7
Perfluorobutanesulfonic acid (PFBS)	375-73-5
Perfluorohexanesulfonic acid (PFHxS)	355-46-4
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8
Perfluorooctanesulfonic acid (PFOS)	1763-23-1
Perfluorodecanesulfonic acid (PFDS)	335-77-3
Perfluorooctane Sulfonamide (PFOSA)	754-91-6
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	2991-50-6
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	2355-31-9
1H,1H,2H,2H-perfluorooctane sulfonate (6:2 FTS)	27619-97-2
1H,1H,2H,2H-perfluorodecane sulfonate (8:2 FTS)	39108-34-4
1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2 FTS)	757124-72-4
Perflouro-1-nonanesulfonate (PFNS)	68259-12-1
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4

The PFAS analyses were performed in accordance with U.S. EPA Method 537 Modified (PFAS by LC/MS/MS Compliant with QSM 5.1 Table B-15). All samples in this SDG were analyzed following the procedures outlined in the DoD QSM, version 5.1 and the project-specific UFP-QAPP with exception of the previously noted accuracy tolerances.

The samples were prepared and analyzed within the holding time required by the method. The samples were prepared and analyzed in one batch. The samples were analyzed on one instrument under one initial calibration (ICAL). Some of the samples were reanalyzed due to QC related deficiencies. The laboratory reported the most compliant run for each sample. Only the final reported analyses and the associated QC are discussed in this report.

Accuracy

Accuracy was evaluated using the percent recovery (%R) obtained from the laboratory control sample (LCS), the LCS duplicate (LCSD), the Extracted Internal Standard (EIS) analytes (also referred to as surrogates in the laboratory report), and Injection Internal Standard (IIS) analytes.

All LCS recoveries were within acceptance criteria except as follows:

Batch # 19197002

Analyte	LCS %R	LCSD %R	Criteria
PFOSA	66	68	73-121%

All associated sample results were qualified as estimated ("J" if detected or "UJ" if non-detect) due to the potential low bias demonstrated by the LCS/LCSD.

All IIS recoveries were within acceptance criteria.

All EIS analytes were within acceptance criteria.

Precision

Precision was evaluated using the RPD obtained from the LCS/LCSD concentrations. Precision was further evaluated by comparing the field duplicate analyte results.

All LCS/LCSD RPDs were within acceptance criteria.

All field duplicate RPDs were within acceptance criteria.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the DoD QSM and project-specific UFP-QAPP;
- Comparing actual analytical procedures to those described in the DoD QSM and project-specific UFP-QAPP;
- Evaluating holding times; and
- Examining field and laboratory blanks for cross contamination of samples during collection and analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the DoD QSM and project-specific UFP-QAPP. All samples were prepared and analyzed within the holding time required by the method. The following QC elements were also evaluated:

- All ICAL criteria were met.
- All initial calibration verification (ICV) criteria were met.
- All continuing calibration verification (CCV) criteria were met.
- All instrument sensitivity check (ISC) criteria were met.
- Raw data was reviewed for qualitative and quantitative accuracy.
- Calculations were spot-checked and verified.

One laboratory method blank was associated with the PFAS analyses in this SDG. The laboratory method blank was non-detect for all target PFAS analytes.

Two field blanks were associated to the water samples in this SDG. The field blanks were non-detect for all target PFAS analytes.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All results for PFAS for the samples in this SDG were considered usable. Therefore, the completeness for the PFAS portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

COMPARABILITY

All data was generated using contract-specific standard methods and reported with known data quality, type of analysis, units, etc.

SENSITIVITY

The LOD and LOQ values reported for the samples were compared to those listed in the QAPP to ensure that sensitivity requirements were met. Sample LODs and LOQs were adjusted based on dilution and/or initial/final volumes.

The LOD and LOQ values were below the project action limit (PAL) listed in the QAPP for all target PFAS.

DATA USABILITY

The purpose of this data validation report is to ensure the integrity and reliability of analytical laboratory data. The data quality is evaluated based on precision, accuracy, representativeness, comparability, and completeness (PARCC) characteristics of the data. The validated data indicated that the laboratory correctly performed the analyses. Based on the data quality assessment, no results were rejected. Although minor QC exceedances were identified for this data set, all data is considered usable for the purposes of this project.

DATA QUALIFIER CHANGES

The following data qualifiers were added, removed, or changed as a result of the data validation process:

Sample ID	Analyte	Units	Original Result	Final Result	Reason Code
BRLTNDG-MW04D-01	PFOSA	ng/l	0.91 U	0.91 UJ	L3
BRLTNDG-MW05S-01	PFOSA	ng/l	0.90 U	0.90 UJ	L3
BRLTN-071019-FB	PFOSA	ng/l	0.87 U	0.87 UJ	L3
BRLTNUP-MW01D-01	PFOSA	ng/l	0.90 U	0.90 UJ	L3
BRLTN03-MW01S-02	PFOSA	ng/l	8.8 U	8.8 UJ	L3
BRLTN02-MW01S-02	PFOSA	ng/l	100	100 J	L3
BRLTN02-MW01D-02	PFOSA	ng/l	0.95 U	0.95 UJ	L3
BRLTN02-MW01S-92	PFOSA	ng/l	91	91 J	L3
V1-MW1-02	PFOSA	ng/l	100	100 J	L3

DATA QUALIFIER DEFINITIONS

The data qualifiers are defined in Table 36.2 of the project-specific UFP-QAPP, as follows:

R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified. The data is unusable.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected. However, the reported LOD is approximate and may or may not accurately and precisely represent the concentration necessary to detect the analyte in the sample.
U	Analyte was not detected and is reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.

REASON CODE DEFINITIONS

Reason codes were used to document the logic behind all data validation qualifiers. The following reason codes for data qualification were associated with the samples in this SDG:

L3: LCS percent recovery infraction with low bias

DATA VALIDATION SUMMARY REPORT

for samples collected from

BURLINGTON AIR NATIONAL GUARD BASE

SOUTH BURLINGTON, VERMONT

Data Validation by: Beth Driskill

Report Date: September 18, 2019

Parsons - Austin

INTRODUCTION

The following data validation summary report covers two (2) surface water samples. The samples were collected from Burlington Air National Guard (ANG) Base in South Burlington, Vermont on July 11, 2019. The samples were logged under the following Sample Delivery Group (SDG):

2053259

The samples in this SDG were analyzed for per- and polyfluoroalkyl substances (PFAS) by U.S. EPA Method 537 modified. The following table details the samples included in this SDG and the analytical parameters performed. The field quality control (QC) samples collected in association with this SDG included one FB sample. The FB was included in SDG 2053542. Equipment blanks are not associated with surface water samples as no equipment is used for collection.

The samples were collected by Parsons and were shipped on ice in one cooler to Eurofins Lancaster Laboratories Environmental (ELLE) in Lancaster, Pennsylvania. The planning documents for this site originally indicated the samples would be analyzed by TestAmerica in Sacramento, California (TA-Sacramento). However, upon initiation of the project, TA-Sacramento did not have sufficient capacity to meet the requirements of the project and therefore, the work was transferred to ELLE. ELLE performed all analyses related to this project. The samples were received by ELLE in good condition and at an acceptable temperature of 2.3 degrees Celsius.

All samples were prepared and analyzed following the procedures outlined in the project-specific Uniform Federal Policy - Quality Assurance Project Plan (UFP-QAPP) and the Department of Defense (DoD) Quality Systems Manual (QSM) Version 5.1.

SAMPLE IDs AND REQUESTED PARAMETERS

Sample ID	Matrix	COMMENTS
BRLTNUP-001-SW	Water	
BRLTNUP-004-SW	Water	

Note: All samples listed above were analyzed for the PFAS method listed in the table below.

EXTRACTION, ANALYTICAL, AND REPORTING DETAILS

Parameter	Matrix	Prep Method	Analytical Method	Units
PFAS	Water	EPA 537 Modified*	EPA 537 Modified	ng/l

ng/l = nanogram per liter

*PFAS by LC/MS/MS compliant with QSM 5.1 Table B-15

EVALUATION CRITERIA

The Level IV data package submitted by the laboratory has been reviewed and verified following the guidelines outlined in the project-specific UFP-QAPP and DoD QSM 5.1. Data qualification was performed following the spirit of the National Functional Guidelines for Organic Data Review even though this document does not specifically include the method for PFAS.

Information reviewed in the data packages included sample results; field and laboratory quality control results; instrument calibration; calibration verifications; case narratives; sample receipt forms, and chain-of-custody (COC) forms. The analyses and findings presented in this report are based on the reviewed information, and whether guidelines in the associated analytical method, DoD QSM and QAPP were met. It should be noted that the final approved QAPP for this project indicated TestAmerica Sacramento was the primary laboratory. However, due to capacity issues with the laboratory, all samples were sent to and analyzed by, ELLE. Therefore, the accuracy tolerances reported in the data packages do not match those listed in the project QAPP. Per the DOD QSM 5.1, statistically derived in-house tolerances should be used for PFAS analysis. As these tolerances differ between laboratories, the limits listed in the analytical reports from ELLE were used to evaluate accuracy.

External Injection Standard (EIS) responses were only used to qualify data when the recovery was excessively high or excessively low. Data associated with EIS recoveries below 10% or above 190% were rejected. Data associated with EIS recoveries below 20% but at or above 10%, or above 180% but at or below 190%, were qualified "J" as estimated. At these extremes, the associated sample data were considered impacted and estimated, or significantly impacted and rejected. Data associated with EIS recoveries between 20% and 180% were not considered significantly impacted and no data qualifiers were applied for EIS recoveries within this range.

A table detailing the data qualifiers applied, removed, or changed for the samples in this SDG as a result of the data validation process is included at the end of this report.

PFAS

General

The PFAS portion of this SDG consisted of two (2) environmental water samples collected on July 11, 2019 and were analyzed for the following target list of 24 PFAS analytes as specified in the project-specific UFP-QAPP.

Analyte	CAS Number
Perfluorobutanoic acid (PFBA)	375-22-4
Perfluoropentanoic acid (PFPeA)	2706-90-3
Perfluorohexanoic acid (PFHxA)	307-24-4
Perfluoroheptanoic acid (PFHpA)	375-85-9
Perfluorooctanoic acid (PFOA)	335-67-1
Perfluorononanoic acid (PFNA)	375-95-1
Perfluorodecanoic acid (PFDA)	335-76-2
Perfluoroundecanoic acid (PFUnA)	2058-94-8
Perfluorododecanoic acid (PFDoA)	307-55-1
Perfluorotridecanoic Acid (PFTriA)	72629-94-8
Perfluorotetradecanoic acid (PFTeA)	376-06-7
Perfluorobutanesulfonic acid (PFBS)	375-73-5
Perfluorohexanesulfonic acid (PFHxS)	355-46-4
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8
Perfluorooctanesulfonic acid (PFOS)	1763-23-1
Perfluorodecanesulfonic acid (PFDS)	335-77-3
Perfluorooctane Sulfonamide (PFOSA)	754-91-6
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	2991-50-6
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	2355-31-9
1H,1H,2H,2H-perfluorooctane sulfonate (6:2 FTS)	27619-97-2
1H,1H,2H,2H-perfluorodecane sulfonate (8:2 FTS)	39108-34-4
1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2 FTS)	757124-72-4
Perflouro-1-nonanesulfonate (PFNS)	68259-12-1
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4

The PFAS analyses were performed in accordance with U.S. EPA Method 537 Modified (PFAS by LC/MS/MS Compliant with QSM 5.1 Table B-15). All samples in this SDG were analyzed following the procedures outlined in the DoD QSM, version 5.1 and the project-specific UFP-QAPP with exception of the previously noted accuracy tolerances.

The samples were prepared and analyzed within the holding time required by the method. The samples were prepared and analyzed in one batch. The samples were analyzed on one instrument under one initial calibration (ICAL). Some of the samples were re-extracted and reanalyzed due to QC related deficiencies. The laboratory reported the most compliant run for each sample. Only the final reported analyses and the associated QC are discussed in this report.

Accuracy

Accuracy was evaluated using the percent recovery (%R) obtained from the laboratory control sample (LCS), the Extracted Internal Standard (EIS) analytes (also referred to as surrogates in the laboratory report), and Injection Internal Standards (IIS) analytes.

All LCS recoveries were within acceptance criteria except as follows.

Batch # 19196009

Analyte	LCS %R	LCSD %R	Criteria
PFOS	153	148	54-139%

The PFOS results in the associated samples were qualified as non-detect at the concentration found due to method blank contamination. Therefore, no additional corrective action or qualification of the data was necessary.

All IIS analytes were within acceptance criteria except as follows.

IIS	Sample ID	%R	Criteria
13C3-PFBA	BRLTNUP-001-SW	46	50-150%

Qualification of the data is not necessary since IIS recovery only impacts EIS response.

All EIS analytes were within acceptance criteria.

Precision

Precision could not be evaluated with this SDG.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the DoD QSM and project-specific UFP-QAPP;
- Comparing actual analytical procedures to those described in the DoD QSM and project-specific UFP-QAPP;
- Evaluating holding times; and
- Examining field and laboratory blanks for cross contamination of samples during collection and analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the DoD QSM and project-specific UFP-QAPP. All samples were prepared and analyzed within the holding time required by the method. The following QC elements were also evaluated:

- All (ICAL) criteria were met.
- All initial calibration verification (ICV) criteria were met.
- All continuing calibration verification (CCV) criteria were met.
- All instrument sensitivity check (ISC) criteria were met.

- Raw data was spot-checked for qualitative and quantitative accuracy.
- Calculations were spot-checked and verified.

One laboratory method blank was associated with the PFAS analyses in this SDG. The laboratory method blank was non-detect for all target PFAS analytes except as follows.

Analyte	Conc. (ng/L)	LOQ (ng/L)
PFOS	12	2.0
PFHxS	1.4 J	2.0
PFHxA	0.66 J	2.0

PFOS was qualified "U" as non-detect at the concentration found in the associated samples. PFHxS and PFHxA were changed to non-detect at the LOQ in samples with detections below the LOQ.

One field blank was associated with the samples in this SDG. The field blank was included in SDG 2053542. The field blank was non-detect for all target PFAS analytes except as follows.

Field Blank ID	Analyte	Conc. (ng/L)	LOQ (ng/L)
BRLTN-071119-FB	PFOS	1.8	1.8
	PFHxS	0.62 J	1.8

PFOS was qualified "U" as non-detect at the concentration found in the associated samples. PFHxS was changed to non-detect at the LOQ in samples with detections below the LOQ.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

All results for PFAS for the samples in this SDG were considered usable. Therefore, the completeness for the PFAS portion of this SDG is 100%, which meets the minimum acceptance criteria of 90%.

COMPARABILITY

All data was generated using contract-specific standard methods and reported with known data quality, type of analysis, units, etc.

SENSITIVITY

The LOD and LOQ values reported for the samples were compared to those listed in the QAPP to ensure that sensitivity requirements were met. Sample LODs and LOQs were adjusted based on dilution and/or initial/final volumes.

The LOD and LOQ values were below the project action limit (PAL) listed in the QAPP for all target PFAS.

DATA USABILITY

The purpose of this data validation report is to ensure the integrity and reliability of analytical laboratory data. The data quality is evaluated based on precision, accuracy, representativeness, comparability, and completeness (PARCC) characteristics of the data. The validated data indicated that the laboratory correctly performed the analyses. Based on the data quality assessment, no results were rejected. Although minor QC exceedances were identified for this data set, all data is considered usable for the purposes of this project.

DATA QUALIFIER CHANGES

The following data qualifiers were added, removed, or changed as a result of the data validation process:

Sample ID	Analyte	Units	Original Result	Final Result	Reason Code
BRLTNUP-001-SW	PFOS	ng/l	3.1 B	3.1 U	B4, B7
BRLTNUP-001-SW	PFHxS	ng/l	7.2 B	7.2	P3
BRLTNUP-001-SW	PFHxA	ng/l	7.8 B	7.8	P3
BRLTNUP-004-SW	PFOS	ng/l	2.1 B	2.1 U	B4, B7
BRLTNUP-004-SW	PFHxS	ng/l	0.90 JB	1.8 U	B4, B7
BRLTNUP-004-SW	PFHxA	ng/l	1.4 JB	1.8 U	B4

DATA QUALIFIER DEFINITIONS

The data qualifiers are defined in Table 36.2 of the project-specific UFP-QAPP, as follows:

R — The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified. The data is unusable.

J — The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

UJ — The analyte was not detected. However, the reported LOD is approximate and may or may not accurately and precisely represent the concentration necessary to detect the analyte in the sample.

U — Analyte was not detected and is reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.

REASON CODE DEFINITIONS

Reason codes were used to document the logic behind all data validation qualifiers. The following reason codes for data qualification were associated with the samples in this SDG:

B4: Method Blank Infraction (Qualified Detect)

B7: Field Blank Infraction (Qualified Detect)

P3: Professional judgement

DATA VALIDATION SUMMARY REPORT

for samples collected from

BURLINGTON AIR NATIONAL GUARD BASE

SOUTH BURLINGTON, VERMONT

Data Validation by: Beth Driskill

Report Date: September 23, 2019

Parsons - Austin

INTRODUCTION

The following data validation summary report covers four (4) water samples, one (1) equipment blank, and one (1) field blank (FB). The samples were collected from Burlington Air National Guard (ANG) Base in South Burlington, Vermont on July 10 and 11, 2019. The samples were logged under the following Sample Delivery Group (SDG):

2053542

The samples in this SDG were analyzed for per- and polyfluoroalkyl substances (PFAS) by U.S. EPA Method 537 modified. The following table details the samples included in this SDG and the analytical parameters performed. The field quality control (QC) samples collected in association with this SDG included one (1) equipment blank and one (2) FB samples. The FB collected on July 10, 2019 was reported in SDG 2053046.

All samples were collected by Parsons and were hand delivered on ice to Eurofins TestAmerica (TA) in South Burlington, Vermont in one cooler on July 11, 2019. TA-Burlington then shipped the samples to Eurofins Lancaster Laboratories Environmental (ELLE). The planning documents for this site originally indicated the samples would be analyzed by TestAmerica in Sacramento, California (TA-Sacramento). However, upon initiation of the project, TA-Sacramento did not have sufficient capacity to meet the requirements of the project and therefore, the work was transferred to ELLE. ELLE performed all analyses related to this project. The samples were received by ELLE in good condition and at an acceptable temperature of 1.8 degrees Celsius.

All samples were prepared and analyzed following the procedures outlined in the project-specific Uniform Federal Policy - Quality Assurance Project Plan (UFP-QAPP) and the Department of Defense (DoD) Quality Systems Manual (QSM) Version 5.1.

SAMPLE IDs AND REQUESTED PARAMETERS

Sample ID	Matrix	COMMENTS
V1-RFW2-02	Water	
BRLTNDG-MW03D-01	Water	
V1-MW12-02	Water	
BRLTN-071119-FB	Water	Field blank

Sample ID	Matrix	COMMENTS
V4-MW414-02	Water	
BRLTN-071119-EB	Water	Equipment blank

Note: All samples listed above were analyzed for the PFAS method listed in the table below.

EXTRACTION, ANALYTICAL, AND REPORTING DETAILS

Parameter	Matrix	Prep Method	Analytical Method	Units
PFAS	Water	EPA 537 Modified*	EPA 537 Modified	ng/l

ng/l = nanogram per liter

*PFAS by LC/MS/MS compliant with QSM 5.1 Table B-15

EVALUATION CRITERIA

The Level IV data package submitted by the laboratory has been reviewed and verified following the guidelines outlined in the project-specific UFP-QAPP and DoD QSM 5.1. Data qualification was performed following the spirit of the National Functional Guidelines for Organic Data Review even though this document does not specifically include the method for PFAS.

Information reviewed in the data packages included sample results; field and laboratory quality control results; instrument calibration; calibration verifications; case narratives; sample receipt forms, and chain-of-custody (COC) forms. The analyses and findings presented in this report are based on the reviewed information, and whether guidelines in the associated analytical method, DoD QSM and QAPP were met. It should be noted that the final approved QAPP for this project indicated TestAmerica Sacramento was the primary laboratory. However, due to capacity issues with the laboratory, all samples were sent to and analyzed by, ELLE. Therefore, the accuracy tolerances reported in the data packages do not match those listed in the project QAPP. Per the DOD QSM 5.1, statistically derived in-house tolerances should be used for PFAS analysis. As these tolerances differ between laboratories, the limits listed in the analytical reports from ELLE were used to evaluate accuracy.

External Injection Standard (EIS) responses were only used to qualify data when the recovery was excessively high or excessively low. Data associated with EIS recoveries below 10% or above 190% were rejected. Data associated with EIS recoveries below 20% but at or above 10%, or above 180% but at or below 190%, were qualified "J" as estimated. At these extremes, the associated sample data were considered impacted and estimated, or significantly impacted and rejected. Data associated with EIS recoveries between 20% and 180% were not considered significantly impacted and no data qualifiers were applied for EIS recoveries within this range.

A table detailing the data qualifiers applied, removed, or changed for the samples in this SDG as a result of the data validation process is included at the end of this report.

PFAS

General

The PFAS portion of this SDG consisted of six (6) samples, including four (4) environmental water samples, one (1) EB, and one (1) FB. The samples were collected on July 10 and 11, 2019 and were analyzed for the following target list of 24 PFAS analytes as specified in the project-specific UFP-QAPP.

Analyte	CAS Number
Perfluorobutanoic acid (PFBA)	375-22-4
Perfluoropentanoic acid (PFPeA)	2706-90-3
Perfluorohexanoic acid (PFHxA)	307-24-4
Perfluoroheptanoic acid (PFHpA)	375-85-9
Perfluorooctanoic acid (PFOA)	335-67-1
Perfluorononanoic acid (PFNA)	375-95-1
Perfluorodecanoic acid (PFDA)	335-76-2
Perfluoroundecanoic acid (PFUnA)	2058-94-8
Perfluorododecanoic acid (PFDoA)	307-55-1
Perfluorotridecanoic Acid (PFTriA)	72629-94-8
Perfluorotetradecanoic acid (PFTeA)	376-06-7
Perfluorobutanesulfonic acid (PFBS)	375-73-5
Perfluorohexanesulfonic acid (PFHxS)	355-46-4
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8
Perfluorooctanesulfonic acid (PFOS)	1763-23-1
Perfluorodecanesulfonic acid (PFDS)	335-77-3
Perfluorooctane Sulfonamide (PFOSA)	754-91-6
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	2991-50-6
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	2355-31-9
1H,1H,2H,2H-perfluorooctane sulfonate (6:2 FTS)	27619-97-2
1H,1H,2H,2H-perfluorodecane sulfonate (8:2 FTS)	39108-34-4
1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2 FTS)	757124-72-4
Perflouro-1-nonanesulfonate (PFNS)	68259-12-1
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4

The PFAS analyses were performed in accordance with U.S. EPA Method 537 Modified (PFAS by LC/MS/MS Compliant with QSM 5.1 Table B-15). All samples in this SDG were analyzed following the procedures outlined in the DoD QSM, version 5.1.1 and the project-specific UFP-QAPP with exception of the previously noted accuracy tolerances.

The samples were prepared and analyzed within the holding time required by the method. The samples were prepared and analyzed in two batches. The samples were analyzed on one instrument under three initial calibrations (ICALs). Some of the samples were reanalyzed due to QC related deficiencies. The laboratory reported the most compliant run for each sample. Only the final reported analyses and the associated QC are discussed in this report.

Accuracy

Accuracy was evaluated using the percent recovery (%R) obtained from the laboratory control sample (LCS), LCS duplicate (LCSD), the Extracted Internal Standard (EIS) analytes (also referred to as surrogates in the laboratory report), and Injection Internal Standard (IIS) analytes.

All LCS and LCSD recoveries were within acceptance criteria except as follows.

Batch# 19197002

Analyte	LCS %R	LCSD %R	Criteria
PFOSA	66	68	73-121%

The PFOSA result in the associated sample, V1-RFW2-02, was qualified "J" as estimated due to the potential low bias.

All IIS recoveries were within acceptance criteria except as follows.

IIS	Sample ID	%R	Criteria
13C4-PFOS	V1-RFW2-02	37	50-150%

Qualification of the data is not necessary since IIS recovery only impacts EIS response.

All EIS analytes were within acceptance criteria except as follows:

Sample ID	Dilution	Extracted Internal Standard	%R	Criteria
V4-MW414-02	1x	13C2-PFTeDA	6	20-180%

The native target compound associated with the non-compliant EIS was qualified "R" as rejected and was considered unusable.

Precision

Precision was evaluated using the RPD obtained from the LCS/LCSD analyte results.

All LCS/LCSD RPDs were within acceptance criteria.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the DoD QSM and project-specific UFP-QAPP;
- Comparing actual analytical procedures to those described in the DoD QSM and project-specific UFP-QAPP;

- Evaluating holding times; and
- Examining field and laboratory blanks for cross contamination of samples during collection and analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the DoD QSM and project-specific UFP-QAPP. All samples were prepared and analyzed within the holding time required by the method. The following QC elements were also evaluated:

- All ICAL criteria were met.
- All initial calibration verification (ICV) criteria were met.
- All continuing calibration verification (CCV) criteria were met.
- All instrument sensitivity check (ISC) criteria were met.
- Raw data was reviewed for qualitative and quantitative accuracy.
- Calculations were spot-checked and verified.

Two laboratory method blanks were associated with the PFAS analyses in this SDG. The laboratory method blanks were non-detect for all target PFAS analytes.

The source blank reported in SDG 2045561 was associated with sample V4-MW414-02 in this SDG. The source blank sample consisted of onsite tap water used to rinse all reusable equipment. The source blank is only associated with samples collected with reusable equipment. The source blank was non-detect for all target PFAS except as follows:

Source Blank ID	Analyte	Conc. (ng/L)	LOQ (ng/L)
BRLTN-FDTAP-SB	PFBS	0.39 J	1.8
	PFHpA	0.58 J	1.8
	PFHxS	0.48 J	1.8
	PFHxA	0.79 J	1.8
	PFOSA	1.1 J	2.7
	PFOS	1.0 J	1.8
	PFOA	1.1 J	1.8

Detected results in the associated samples for the analytes above were qualified "U" at the LOQ if detected below the LOQ. Results detected above the LOQ or non-detect results were not affected and were not qualified.

Two field blanks were associated with samples in this SDG. The field blank collected on July 10, 2019 was non-detect for all target PFAS. The field blank collected on July 11, 2019 was non-detect for all target PFAS analytes, except as follows:

Field Blank ID	Analyte	Conc. (ng/1)	LOQ (ng/1)
BRLTN-071119-FB	PFHxS	0.62 J	1.8
	PFOS	1.8	1.8

The PFHxS result in sample V4-MW414-02 was qualified as non-detect at the LOQ. The PFOS result in sample V4-MW414-02 was qualified as non-detect at the concentration found. No additional corrective action was necessary because all other associated sample results were either detected above the LOQ for PFHxS, greater than 5 times the FB concentration for PFOS, or were non-detect and therefore were not affected.

One equipment blank was associated with sample V4-MW414-02 in this SDG. All other samples were collected using dedicated or disposable equipment; therefore, an equipment blank was not applicable. The equipment blank was non-detect for all target PFAS analytes.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

One PFAS result in this SDG was qualified "R" as rejected and considered unusable. Therefore, the completeness for the PFAS portion of this SDG is 99%, which meets the minimum acceptance criteria of 90%.

COMPARABILITY

All data was generated using contract-specific standard methods and reported with known data quality, type of analysis, units, etc.

SENSITIVITY

The LOD and LOQ values reported for the samples were compared to those listed in the QAPP to ensure that sensitivity requirements were met. Sample LODs and LOQs were adjusted based on dilution and/or initial/final volumes.

The LOD and LOQ values were below the project action limit (PAL) listed in the QAPP for all target PFAS.

DATA USABILITY

The purpose of this data validation report is to ensure the integrity and reliability of analytical laboratory data. The data quality is evaluated based on precision, accuracy, representativeness, comparability, and completeness (PARCC) characteristics of the data. One PFAS result was qualified as rejected due to extreme exceedances in the associated EIS which caused the result to be unusable. All other data is considered usable for the purposes of this project.

DATA QUALIFIER CHANGES

The following data qualifiers were added, removed, or changed as a result of the data validation process:

Sample ID	Analyte	Units	Original Result	Final Result	Reason Code
V1-RFW2-02	PFOSA	ng/l	130	130 J	L3
V4-MW414-02	PFTeDA	ng/l	0.92 U	0.92 R	I12
V4-MW414-02	PFHxS	ng/l	1.1 J	1.8 U	B7, B9
V4-MW414-02	PFOS	ng/l	3.7	3.7 U	B7
V4-MW414-02	PFHxA	ng/l	0.49 J	1.8 U	B9
V4-MW414-02	PFOSA	ng/l	1.1 J	1.8 U	B9
V4-MW414-02	PFOA	ng/l	0.50 J	1.8 U	B9

DATA QUALIFIER DEFINITIONS

The data qualifiers are defined in Table 36.2 of the project-specific UFP-QAPP, as follows:

R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified. The data is unusable.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected. However, the reported LOD is approximate and may or may not accurately and precisely represent the concentration necessary to detect the analyte in the sample.
U	Analyte was not detected and is reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.

REASON CODE DEFINITIONS

Reason codes were used to document the logic behind all data validation qualifiers. The following reason codes for data qualification were associated with the samples in this SDG:

L3: LCS percent recovery Infraction with Low Bias

I12: EIS percent recovery infraction with no assignable bias

B7: Field Blank Infraction (Qualified Detect)

B9: Source Blank Infraction (Qualified Detect)

DATA VALIDATION SUMMARY REPORT

for samples collected from

BURLINGTON AIR NATIONAL GUARD BASE

SOUTH BURLINGTON, VERMONT

Data Validation by: Beth Driskill

Report Date: September 23, 2019

Parsons - Austin

INTRODUCTION

The following data validation summary report covers ten (10) water samples and one (1) field blank (FB). The samples were collected from Burlington Air National Guard (ANG) Base in South Burlington, Vermont on July 11 and 12, 2019. The samples were logged under the following Sample Delivery Group (SDG):

2053572

The samples in this SDG were analyzed for per- and polyfluoroalkyl substances (PFAS) by U.S. EPA Method 537 modified. The following table details the samples included in this SDG and the analytical parameters performed. The field quality control (QC) samples associated with the samples in this SDG include one field duplicate (FD), one matrix spike /matrix spike duplicate (MS/MSD) pair, and two field blanks (FBs). The FB collected on July 11, 2019 was reported in SDG 2053542. The equipment blank samples associated with field samples collected using decontaminated equipment were reported in SDGs 2053542 and 2053579. Equipment blanks were not applicable to the field samples collected using disposable or dedicated equipment.

All samples were collected by Parsons and were hand delivered on ice to Eurofins TestAmerica (TA) in South Burlington, Vermont in two coolers on July 12, 2019. TA-Burlington then shipped the samples to Eurofins Lancaster Laboratories Environmental (ELLE). The planning documents for this site originally indicated the samples would be analyzed by TestAmerica in Sacramento, California (TA-Sacramento). However, upon initiation of the project, TA-Sacramento did not have sufficient capacity to meet the requirements of the project and therefore, the work was transferred to ELLE. ELLE performed all analyses related to this project. The samples were received by ELLE in good condition and at acceptable temperatures of 1.2 and 3.7 degrees Celsius.

All samples were prepared and analyzed following the procedures outlined in the project-specific Uniform Federal Policy - Quality Assurance Project Plan (UFP-QAPP) and the Department of Defense (DoD) Quality Systems Manual (QSM) Version 5.1.

SAMPLE IDs AND REQUESTED PARAMETERS

Sample ID	Matrix	COMMENTS
BTV-MW-14-02	Water	
BTV-MW-14-92	Water	FD of BTV-MW-14-02
BTV-MW-9-02	Water	
BRLTNDG-MW01S-02	Water	
BRLTN04-MW01D-01	Water	
V4-BR03-02	Water	
BRLTNDG-MW02S-01	Water	
BRLTN-071219-FB	Water	Field blank
V1-MW-106-02	Water	MS/MSD
MW-101-02	Water	
BRLTNDG-MW01D-02	Water	

Note: All samples listed above were analyzed for the PFAS method listed in the table below.

EXTRACTION, ANALYTICAL, AND REPORTING DETAILS

Parameter	Matrix	Prep Method	Analytical Method	Units
PFAS	Water	EPA 537 Modified	EPA 537 Modified*	ng/l

* PFAS by LC/MS/MS Compliant with QSM 5.1 Table B-15

EVALUATION CRITERIA

The Level IV data package submitted by the laboratory has been reviewed and verified following the guidelines outlined in the project-specific UFP-QAPP and DoD QSM 5.1. Data qualification was performed following the spirit of the National Functional Guidelines for Organic Data Review even though this document does not specifically include the method for PFAS.

Information reviewed in the data packages included sample results; field and laboratory quality control results; instrument calibration; calibration verifications; case narratives; sample receipt forms, and chain-of-custody (COC) forms. The analyses and findings presented in this report are based on the reviewed information, and whether guidelines in the associated analytical method, DoD QSM and QAPP were met. It should be noted that the final approved QAPP for this project indicated TestAmerica Sacramento was the primary laboratory. However, due to capacity issues with the laboratory, all samples were sent to and analyzed by, ELLE. Therefore, the accuracy tolerances reported in the data packages do not match those listed in the project QAPP. Per the DOD QSM 5.1, statistically derived in-house tolerances should be used for PFAS analysis. As these tolerances differ between laboratories, the limits listed in the analytical reports from ELLE were used to evaluate accuracy.

External Injection Standard (EIS) responses were only used to qualify data when the recovery was excessively high or excessively low. Data associated with EIS recoveries

below 10% or above 190% were rejected. Data associated with EIS recoveries below 20% but at or above 10%, or above 180% but at or below 190%, were qualified "J" as estimated. At these extremes, the associated sample data were considered impacted and estimated, or significantly impacted and rejected. Data associated with EIS recoveries between 20% and 180% were not considered significantly impacted and no data qualifiers were applied for EIS recoveries within this range.

A table detailing the data qualifiers applied, removed, or changed for the samples in this SDG as a result of the data validation process is included at the end of this report.

PFAS

General

The PFAS portion of this SDG consisted of (10) environmental water samples and one (1) FB. The samples were collected on July 11th and 12th, 2019 and were analyzed for the following target list of 24 PFAS compounds as specified in the project-specific UFP-QAPP.

Analyte	CAS Number
Perfluorobutanoic acid (PFBA)	375-22-4
Perfluoropentanoic acid (PFPeA)	2706-90-3
Perfluorohexanoic acid (PFHxA)	307-24-4
Perfluoroheptanoic acid (PFHpA)	375-85-9
Perfluorooctanoic acid (PFOA)	335-67-1
Perfluorononanoic acid (PFNA)	375-95-1
Perfluorodecanoic acid (PFDA)	335-76-2
Perfluoroundecanoic acid (PFUnA)	2058-94-8
Perfluorododecanoic acid (PFDoA)	307-55-1
Perfluorotridecanoic acid (PFTriA)	72629-94-8
Perfluorotetradecanoic acid (PFTeA)	376-06-7
Perfluorobutanesulfonic acid (PFBS)	375-73-5
Perfluorohexanesulfonic acid (PFHxS)	355-46-4
Perfluoroheptanesulfonic acid (PFHpS)	375-92-8
Perfluorooctanesulfonic acid (PFOS)	1763-23-1
Perfluorodecanesulfonic acid (PFDS)	335-77-3
Perfluorooctane sulfonamide (PFOSA)	754-91-6
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	2991-50-6
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	2355-31-9
1H,1H,2H,2H-perfluorooctane sulfonate (6:2 FTS)	27619-97-2
1H,1H,2H,2H-perfluorodecane sulfonate (8:2 FTS)	39108-34-4
1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2 FTS)	757124-72-4
Perflouro-1-nonanesulfonate (PFNS)	68259-12-1

Analyte	CAS Number
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4

The PFAS analyses were performed in accordance with U.S. EPA Method 537 Modified (PFAS by LC/MS/MS Compliant with QSM 5.1 Table B-15). All samples in this SDG were analyzed following the procedures outlined in the DoD QSM, version 5.1 and the project-specific UFP-QAPP with exception of the previously noted accuracy tolerances.

The samples were analyzed within the 14-day holding time listed in the project-specific UFP-QAPP.

The samples were prepared and analyzed in three batches. The samples were analyzed on one instrument under three initial calibrations (ICALs). Some of the samples were reanalyzed due to QC related deficiencies. The laboratory reported the most compliant run for each sample. Only the final reported analyses and the associated QC are discussed in this report.

Accuracy

Accuracy was evaluated using the percent recovery (%R) obtained from the laboratory control sample (LCS), MS/MSD, the Extracted Internal Standards (EIS), and the Injection Internal Standards (IIS). It should be noted that the laboratory report occasionally references the EIS as surrogate standards. Sample V1-MW-106-02 was designated for MS/MSD analysis on the COC.

All LCS recoveries were within acceptance criteria except as follows.

Batch # 19202001

Analyte	LCS %R	Criteria
PFOSA	69	73-121%

The results for PFOSA in the samples associated with this LCS were qualified “UJ” as estimated due to the potential low bias.

All MS/MSD recoveries were within acceptance criteria except as follows.

Batch # 19204020 (V1-MW-106-02)

Analyte	MS %R	MSD %R	Criteria
6:2 FTS	313	217	51-155%
PFBS	-4914	-5489	81-133%
PFBA	-192	-234	84-135%
PFDS	245	242	69-124%
PFHpS	6708	7075	80-129%
PFHpA	1241	1338	80-140%
PFHxS	-6864	-6622	71-131%
PFHxA	-4381	-4689	80-137%
PFNS	302	281	71-121%
PFNA	139	111	73-140%

PFOS	-86217	-92677	54-139%
PFOA	-2962	-3359	83-138%
PFPeS	-3199	-4105	82-132%
PFPeA	-2030	-2427	75-138%

The result for PFDS was non-detect in the parent sample. Therefore, data quality was not affected by the potential high bias and no corrective action was necessary. The PFNS result in the parent sample was qualified "J" as estimated due to the potential high bias. All other analytes listed above had a parent sample concentration greater than 4 times the spike amount, resulting in the anomalous recoveries. Therefore, no additional corrective action was necessary.

All IIS recoveries were within acceptance criteria except as follows:

IIS	Sample ID	%R	Criteria
13C4-PFOS	V1-MW-106-02	25	50-150%
13C3-PFBA	V1-MW-106-02	47	
13C3-PFBA	BRLTNDG-MW02S-01	35	

Qualification of the data is not necessary since IIS recovery only impacts EIS response.

All EIS recoveries were within acceptance criteria except as follows:

Sample ID	Dilution	EIS	%R	Criteria
MW-101-02	1x	13C2-4:2-FTS	183	20-180%
BRLTNDG-MW01D-02	1x	13C2-4:2-FTS	219	
BRLTNDG-MW02S-01	1x	13C3-PFBS	191	

The native target compounds associated with the non-compliant EIS in samples BRLTNDG-MW01D-02 and BRLTNDG-MW02S-01 were qualified "R" as rejected and considered unusable due to the very high recoveries. The native target compound associated with the non-compliant EIS 13C2-4:2-FTS in sample MW-101-02 was qualified "J" as estimated.

Precision

Precision was evaluated using the relative percent difference (RPD) obtained from the MS/MSD concentrations. Precision was further evaluated by comparing the FD analyte results.

All MS/MSD RPDs were within acceptance criteria.

All field duplicate RPDs were within acceptance criteria.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the DoD QSM and project-specific UFP-QAPP;

- Comparing actual analytical procedures to those described in the DoD QSM and project-specific UFP-QAPP;
- Evaluating holding times; and
- Examining field and laboratory blanks for cross contamination of samples during collection and analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the DoD QSM and project-specific UFP-QAPP. All samples were prepared and analyzed within the holding time required by the method. The following QC elements were also evaluated:

- All ICAL criteria were met.
- All initial calibration verification (ICV) criteria were met.
- All continuing calibration verification (CCV) criteria were met.
- All instrument sensitivity check (ISC) criteria were met.
- Raw data was spot-checked for qualitative and quantitative accuracy.
- Calculations were spot-checked and verified.

Three laboratory method blanks were associated with the PFAS analyses in this SDG. The laboratory method blanks were non-detect for all target PFAS analytes except as follows:

Batch# 19203040

Analyte	Conc. (ng/L)	LOQ (ng/L)
PFOS	0.57 J	2.0

All associated sample results were non-detect for PFOS. Therefore, no corrective action was necessary.

The source blank reported in SDG 2045561 was associated with samples BRLTN04-MW01D-01, V4-BR03-02, and BRLTNDG-MW01D-02 in this SDG. The source blank sample consisted of onsite tap water used to rinse all reusable equipment. The source blank is only associated to samples collected with reusable equipment. The source blank was non-detect for all target PFAS except as follows:

Source Blank ID	Analyte	Conc. (ng/L)	LOQ (ng/L)
BRLTN-FDTAP-SB	PFBS	0.39 J	1.8
	PFHpA	0.58 J	1.8
	PFHxS	0.48 J	1.8
	PFHxA	0.79 J	1.8
	PFOSA	1.1 J	2.7
	PFOS	1.0 J	1.8
	PFOA	1.1 J	1.8

Results below the LOQ for these analytes were changed to non-detect at the LOQ in the associated samples.

Two equipment blanks were associated with the PFAS analyses in this SDG. The equipment blank collected on 7/11/19 was associated with samples BRLTN04-MW01D-01 and V4-BR03-02. The equipment blank collected on 7/12/19 was associated with sample BRLTNDG-MW01D-02. The remaining samples in this SDG were not associated with an equipment blank because they were collected using dedicated or disposable equipment. The equipment blanks were non-detect for all target PFAS analytes.

Two field blanks were associated with the samples in this SDG. Field blank BRLTN-071119-FB was reported in SDG 2053542 and was associated with all samples collected on July 11, 2019. Field blank BRLTN-071219-FB was associated with all samples collected on July 12, 2019. The field blanks were non-detect for all target PFAS analytes except as follows:

Field Blank ID	Analyte	Conc. (ng/1)	LOQ (ng/1)
BRLTN-071119-FB	PFHxS	0.62 J	1.8
	PFOS	1.8	1.8

The results for PFHxS were above the LOQ in the associated samples. Therefore, no corrective action was necessary. Associated sample results that were below the LOQ for PFOS were changed to non-detect at the LOQ. PFOS detections greater than the LOQ but less than five times the field blank concentration were flagged "U" at the concentration found.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

Three PFAS results in this SDG were qualified "R" as rejected and considered unusable. Therefore, the completeness for the PFAS in this SDG is 99%, which meets the minimum acceptance criteria of 90%.

COMPARABILITY

All data was generated using contract-specific standard methods and reported with known data quality, type of analysis, units, etc.

SENSITIVITY

The LOD and LOQ values reported for the samples were compared to those listed in the QAPP to ensure that sensitivity requirements were met. Sample LODs and LOQs were adjusted based on dilution and/or initial/final volumes.

The LOD and LOQ values were below the project action limit (PAL) listed in the QAPP for all target PFAS.

DATA USABILITY

The purpose of this data validation report is to ensure the integrity and reliability of analytical laboratory data. The data quality is evaluated based on precision, accuracy, representativeness, comparability, and completeness (PARCC) characteristics of the data. Three PFAS results were qualified as rejected and considered unusable due to extreme exceedances in the associated EIS. Minor QC exceedances where data was qualified as estimated and flagged "J" are considered usable for the purposes of this project.

DATA QUALIFIER CHANGES

The following data qualifiers were added, removed, or changed as a result of the data validation process:

Sample ID	Analyte	Units	Original Result	Final Result	Reason Code
MW-101-02	PFOSA	ng/l	0.89 U	0.89 UJ	L3
BRLTNDG-MW01D-02	PFOSA	ng/l	0.91 U	0.91 UJ	L3
V1-MW-106-02	PFNS	ng/l	4.3	4.3 J	M2
MW-101-02	4:2 FTS	ng/l	3.9	3.9 J	I12
BRLTNDG-MW01D-02	4:2 FTS	ng/l	0.91 U	0.91 R	I12
BRLTNDG-MW02S-01	PFBS	ng/l	15	15 R	I12
BRLTNDG-MW02S-01	PFPeS	ng/l	15	15 R	I12
BRLTN04-MW01D-01	PFBS	ng/l	1.2 J	5.0 U	B9
BRLTN04-MW01D-01	PFHpA	ng/l	2.1 J	5.0 U	B9
BRLTN04-MW01D-01	PFOA	ng/l	1.9 J	5.0 U	B9
V4-BR03-02	PFBS	ng/l	0.98 J	1.8 U	B9
V4-BR03-02	PFHxA	ng/l	1.5 J	1.8 U	B9
V4-BR03-02	PFOA	ng/l	1.1 J	1.8 U	B9
BRLTNDG-MW01D-02	PFBS	ng/l	1.7 J	1.8 U	B9
BRLTNDG-MW01D-02	PFOS	ng/l	0.52 J	1.8 U	B9
BRLTN04-MW01D-01	PFOS	ng/l	43 B	43	P3
BTV-MW-9-02	PFOS	ng/l	5.5	5.5 U	B7
BRLTNDG-MW01S-02	PFOS	ng/l	0.74 J	1.8 U	B7
BRLTNDG-MW02S-01	PFOS	ng/l	2.5	2.5 U	B7

DATA QUALIFIER DEFINITIONS

The data qualifiers are defined in Table 36.2 of the project-specific UFP-QAPP, as follows:

R — The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified. The data is unusable.

J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected. However, the reported LOD is approximate and may or may not accurately and precisely represent the concentration necessary to detect the analyte in the sample.
U	Analyte was not detected and is reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.

REASON CODE DEFINITIONS

Reason codes were used to document the logic behind all data validation qualifiers. The following reason codes for data qualification were associated with the samples in this SDG:

L3: LCS percent recovery Infraction with Low Bias

I12: EIS percent recovery infraction with no assignable bias

M2: MS/MSD percent recovery Infraction with High Bias

B7: Field Blank Infraction (Qualified Detect)

B9: Source Blank Infraction (Qualified Detect)

P3: Professional Judgment

DATA VALIDATION SUMMARY REPORT

for samples collected from

BURLINGTON AIR NATIONAL GUARD BASE

SOUTH BURLINGTON, VERMONT

Data Validation by: Sandra de las Fuentes

Report Date: September 23, 2019

Parsons - Austin

INTRODUCTION

The following data validation summary report covers three (3) water samples and one (1) equipment blank (EB). The samples were collected from Burlington Air National Guard (ANG) Base in South Burlington, Vermont on July 12, 2019. The samples were logged under the following Sample Delivery Group (SDG):

2053579

The samples in this SDG were analyzed for per- and polyfluoroalkyl substances (PFAS) by U.S. EPA Method 537 modified. The following table details the sample IDs and requested parameters. The field quality control (QC) samples collected in association with this SDG included one matrix spike/matrix spike duplicate (MS/MSD) pair, one EB, one FB, and one source blank (SB). The SB was reported in SDG 2045561. The associated field blank, BRLTN-071219-FB, was reported in SDG 2053572. The equipment blank included in this SDG was associated with two samples from other SDGs, as follows: BRLTNDG-MW01D-02 in SDG 2053572 and BRLTN03-MW01D-02 in SDG 2053726. The EB reported in this SDG was not associated with any samples in this SDG as all samples were collected using dedicated or disposable equipment.

All samples were collected by Parsons and were hand delivered on ice to Eurofins TestAmerica (TA) in South Burlington, Vermont in one cooler on July 12, 2019. TA-Burlington then shipped the samples to Eurofins Lancaster Laboratories Environmental (ELLE). The samples were received by ELLE in good condition and at an acceptable temperature of 1.2 and 3.7 degrees Celsius.

All samples were prepared and analyzed following the procedures outlined in the project-specific Uniform Federal Policy - Quality Assurance Project Plan (UFP-QAPP) and the Department of Defense (DoD) Quality Systems Manual (QSM) Version 5.1.

SAMPLE IDs AND REQUESTED PARAMETERS

Sample ID	Matrix	COMMENTS
BRLTN-071219-EB	Water	Equipment Blank
BRLTN-MW03S-01	Water	
BRLTN-MW05D-01	Water	

Sample ID	Matrix	COMMENTS
BRLTN-MW04D-02	Water	MS/MSD

Note: All samples listed above were analyzed for the PFAS method listed in the table below.

EXTRACTION, ANALYTICAL, AND REPORTING DETAILS

Parameter	Matrix	Prep Method	Analytical Method	Units
PFAS	Water	EPA 537 Modified*	EPA 537 Modified*	ng/l

ng/l = nanogram per liter

* PFAS by LC/MS/MS Compliant with QSM 5.1 Table B-15

EVALUATION CRITERIA

The Level IV data package submitted by the laboratory has been reviewed and verified following the guidelines outlined in the project-specific UFP-QAPP and DoD QSM 5.1. Data qualification was performed following the spirit of the National Functional Guidelines for Organic Data Review even though this document does not specifically include the method for PFAS.

Information reviewed in the data packages included sample results; field and laboratory quality control results; instrument calibration; calibration verifications; case narratives; sample receipt forms, and chain-of-custody (COC) forms. The analyses and findings presented in this report are based on the reviewed information, and whether guidelines in the associated analytical method, DoD QSM and QAPP were met. It should be noted that the final approved QAPP for this project indicated TestAmerica Sacramento was the primary laboratory. However, due to capacity issues with the laboratory, all samples were sent to and analyzed by, ELLE. Therefore, the accuracy tolerances reported in the data packages do not match those listed in the project QAPP. Per the DOD QSM 5.1, statistically derived in-house tolerances should be used for PFAS analysis. As these tolerances differ between laboratories, the limits listed in the analytical reports from ELLE were used to evaluate accuracy.

External Injection Standard (EIS) responses were only used to qualify data when the recovery was excessively high or excessively low. Data associated with EIS recoveries below 10% or above 190% were rejected. Data associated with EIS recoveries below 20% but at or above 10%, or above 180% but at or below 190%, were qualified “J” as estimated. At these extremes, the associated sample data were considered impacted and estimated, or significantly impacted and rejected. Data associated with EIS recoveries between 20% and 180% were not considered significantly impacted and no data qualifiers were applied for EIS recoveries within this range.

A table detailing the data qualifiers applied, removed, or changed for the samples in this SDG as a result of the data validation process is included at the end of this report.

PFAS

General

The PFAS portion of this SDG consisted of four (4) samples, including three (3) environmental water samples, and one (1) EB. The samples were collected on July 12, 2019 and were analyzed for the following target list of 24 PFAS compounds as specified in the project-specific UFP-QAPP.

Analyte	CAS Number
Perfluorobutanoic acid (PFBA)	375-22-4
Perfluoropentanoic acid (PFPeA)	2706-90-3
Perfluorohexanoic acid (PFHxA)	307-24-4
Perfluoroheptanoic acid (PFHpA)	375-85-9
Perfluorooctanoic acid (PFOA)	335-67-1
Perfluorononanoic acid (PFNA)	375-95-1
Perfluorodecanoic acid (PFDA)	335-76-2
Perfluoroundecanoic acid (PFUnA)	2058-94-8
Perfluorododecanoic acid (PFDoA)	307-55-1
Perfluorotridecanoic Acid (PFTriA)	72629-94-8
Perfluorotetradecanoic acid (PFTeA)	376-06-7
Perfluorobutanesulfonic acid (PFBS)	375-73-5
Perfluorohexanesulfonic acid (PFHxS)	355-46-4
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8
Perfluorooctanesulfonic acid (PFOS)	1763-23-1
Perfluorodecanesulfonic acid (PFDS)	335-77-3
Perfluorooctane Sulfonamide (PFOSA)	754-91-6
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	2991-50-6
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	2355-31-9
1H,1H,2H,2H-perfluorooctane sulfonate (6:2 FTS)	27619-97-2
1H,1H,2H,2H-perfluorodecane sulfonate (8:2 FTS)	39108-34-4
1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2 FTS)	757124-72-4
Perflouro-1-nonanesulfonate (PFNS)	68259-12-1
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4

The PFAS analyses were performed in accordance with U.S. EPA Method 537 Modified (PFAS by LC/MS/MS Compliant with QSM 5.1 Table B-15). All samples in this SDG were analyzed following the procedures outlined in the DoD QSM, version 5.1 and the project-specific UFP-QAPP with exception of the previously noted accuracy tolerances.

The samples were prepared and analyzed within the holding time required by the method. The samples were prepared and analyzed in one batch. The samples were analyzed on one instrument under one ICAL. Some of the samples were reanalyzed due to QC related

deficiencies. The laboratory reported the most compliant run for each sample. Only the final reported analyses and the associated QC are discussed in this report.

Accuracy

Accuracy was evaluated using the percent recovery (%R) obtained from the laboratory control sample (LCS), matrix spike (MS) matrix spike duplicate (MSD), the Extracted Internal Standard (EIS) analytes (also referred to as surrogates in the laboratory report), and the Injection Internal Standards (IIS). Sample BRLTNDG-MW04D-02 was designated on the COC for MS/MSD analysis.

All LCS recoveries were within acceptance criteria, except as follows:

Batch# 19202001

Analyte	LCS %R	Criteria
PFOSA	69	73-121%

The PFOSA results in the associated samples were qualified "UJ" as estimated due to the potential low bias.

All MS and MSD recoveries were within acceptance criteria except as follows:

Analyte	MS %R	MSD %R	Criteria
PFBS	(100)	80	81-133%
PFBA	(97)	73	84-135%
PFDS	64	30	69-124%
PFHpS	(91)	78	80-129%
PFHxS	36	51	71-131%
PFHxA	(87)	40	80-137%
PFNS	(90)	60	71-121%
PFOSA	72	69	73-121%
PFOA	(87)	81	83-138%
PFTriA	27	(67)	67-144%

( ) indicates the recovery met criteria.

The parent sample concentration for PFHxA was significantly greater than (more than 4 times) the amount spiked, resulting in the anomalous recoveries. Therefore, no corrective action was necessary for PFHxA. All other analytes were qualified as estimated ("J" if detected or "UJ" if non-detect) in the parent sample due to the potential low bias.

All IIS recoveries were within acceptance criteria.

All EIS recoveries were within acceptance criteria except as follows:

Sample ID	Dilution	EIS	%R	Criteria
BRLTNDG-MW05D-01	1x	13C2-PFTeA	6	20-180%
BRLTNDG-MW04D-02	1x	13C2-PFTeA	3	

The native target compounds associated with the non-compliant EIS were qualified "R" as rejected in the samples noted above due to the very low recoveries.

Precision

Precision was evaluated using the relative percent difference (RPD) obtained from the MS/MSD analyte results.

All MS/MSD RPDs were within acceptance criteria, except as follows:

Analyte	RPD	Criteria
PFDS	73	RPD ≤ 30
PFNS	40	
PFTriA	85	

The parent sample was non-detect for all three analytes. Therefore, no corrective action was necessary.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the DoD QSM and project QAPP;
- Comparing actual analytical procedures to those described in the DoD QSM and project-specific UFP-QAPP;
- Evaluating holding times; and
- Examining field and laboratory blanks for cross contamination of samples during collection and analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the DoD QSM and project-specific UFP-QAPP. All samples were prepared and analyzed within the holding time required by the method. The following QC elements were also evaluated:

- All initial calibration criteria were met.
- All initial calibration verification (ICV) criteria were met.
- All continuing calibration verification (CCV) criteria were met.
- All instrument sensitivity check (ISC) criteria were met.
- Raw data was spot-checked for qualitative and quantitative accuracy.
- Calculations were spot-checked and verified.

One laboratory method blank was associated with the PFAS analyses in this SDG. The laboratory method blank was non-detect for all target PFAS analytes.

As noted previously, BRLTNDG-071219-EB was associated with BRLTNDG-MW01D-02 in SDG 2053572 and BRLTN03-MW01D-02 in SDG 2053726. It should be noted the EB was non-detect for all analytes.

Field blank BRLTN-071219-FB reported in SDG 2053572 was associated with the PFAS analyses in this SDG. The field blank was non-detect for all target PFAS analytes.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

Two PFAS results for the samples in this SDG were qualified "R" as rejected and considered unusable. Therefore, the completeness for the PFAS portion of this SDG is 98%, which meets the minimum acceptance criteria of 90%.

COMPARABILITY

All data was generated using contract-specific standard methods and reported with known data quality, type of analysis, units, etc.

SENSITIVITY

The LOD and LOQ values reported for the samples were compared to those listed in the QAPP to ensure that sensitivity requirements were met. Sample LODs and LOQs were adjusted based on dilution and/or initial/final volumes.

The LOD and LOQ values were below the project action limit (PAL) listed in the QAPP for all target PFAS.

DATA USABILITY

The purpose of this data validation report is to ensure the integrity and reliability of analytical laboratory data. The data quality is evaluated based on precision, accuracy, representativeness, comparability, and completeness (PARCC) characteristics of the data. Two PFAS results were qualified as rejected due to extreme exceedances in the associated EIS and were therefore considered unusable. All other data is considered usable for the purposes of this project.

DATA QUALIFIER CHANGES

The following data qualifiers were added, removed, or changed as a result of the data validation process:

Sample ID	Analyte	Units	Original Result	Final Result	Reason Code
BRLTNDG-04D-02	PFOSA	ng/l	0.88 U	0.88 UJ	M3, L3
BRLTNDG-04D-02	PFBA	ng/l	9.1	9.1 J	M3
BRLTNDG-04D-02	PFBS	ng/l	15	15 J	M3
BRLTNDG-04D-02	PFDS	ng/l	0.88 U	0.88 UJ	M3
BRLTNDG-04D-02	PFHpS	ng/l	0.88 U	0.88 UJ	M3
BRLTNDG-04D-02	PFHxS	ng/l	9.1	9.1 J	M3

Sample ID	Analyte	Units	Original Result	Final Result	Reason Code
BRLTNDG-04D-02	PFNS	ng/l	0.88 U	0.88 UJ	M3
BRLTNDG-04D-02	PFOA	ng/l	2.1	2.1 J	M3
BRLTNDG-04D-02	PFTriA	ng/l	0.88 U	0.88 UJ	M3
BRLTN-071219-EB	PFOSA	ng/l	0.92 U	0.92 UJ	L3
BRLTNDG-MW03S-01	PFOSA	ng/l	1.1	1.1 J	L3
BRLTNDG-MW05D-01	PFOSA	ng/l	0.93 U	0.93 UJ	L3
BRLTNDG-MW05D-01	PFTeA	ng/l	0.93 U	0.93 R	I12
BRLTNDG-MW04D-02	PFTeA	ng/l	0.88 U	0.88 R	I12

DATA QUALIFIER DEFINITIONS

The data qualifiers are defined in Table 36.2 of the project-specific UFP-QAPP, as follows:

R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified. The data is unusable.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected. However, the reported LOD is approximate and may or may not accurately and precisely represent the concentration necessary to detect the analyte in the sample.
U	Analyte was not detected and is reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.

REASON CODE DEFINITIONS

Reason codes were used to document the logic behind all data validation qualifiers. The following reason codes for data qualification were associated with the samples in this SDG:

L3: LCS percent recovery infraction with low bias

M3: MS/MSD percent recovery infraction with low bias

I12: EIS percent recovery infraction with no assigned bias

DATA VALIDATION SUMMARY REPORT

for samples collected from

BURLINGTON AIR NATIONAL GUARD BASE

SOUTH BURLINGTON, VERMONT

Data Validation by: Sandra de las Fuentes

Report Date: September 24, 2019

Parsons - Austin

INTRODUCTION

The following data validation summary report covers twelve (12) water samples, two (2) field blanks (FBs), and one (1) equipment blank (EB). The samples were collected from Burlington Air National Guard (ANG) Base in South Burlington, Vermont on July 12 through July 14, 2019. The samples were logged under the following Sample Delivery Group (SDG):

2053726

The samples in this SDG were analyzed for per- and polyfluoroalkyl substances (PFAS) by U.S. EPA Method 537 modified. The following table details the samples included in this SDG and the analytical parameters performed. The field quality control (QC) samples collected in association with this SDG included one (1) matrix spike/matrix spike duplicate (MS/MSD) pair, one (1) field duplicate (FD), and three (3) field blanks. The field blank associated with samples collected on July 12, 2019 (BRLTN-071219-FB) was reported in SDG 2053572. Sample BRLTN03-MW01D-02 was associated with the EB in SDG 2053579. The EB was non-detect for all PFAS analytes. The EB in this SDG was only associated with BRLTN04-MW01D-02. See the equipment blank discussion in the representativeness section for details.

All samples were collected by Parsons and shipped directly to Eurofins Lancaster Laboratories Environmental (ELLE) in one cooler. The planning documents for this site originally indicated the samples would be analyzed by TestAmerica in Sacramento, California (TA-Sacramento). However, upon initiation of the project, TA-Sacramento did not have sufficient capacity to meet the requirements of the project and therefore, the work was transferred to ELLE. ELLE performed all analyses related to this project. The samples were received by ELLE in good condition and at an acceptable temperature of 0.5 degrees Celsius.

All samples were prepared and analyzed following the procedures outlined in the project-specific Uniform Federal Policy - Quality Assurance Project Plan (UFP-QAPP) and the Department of Defense (DoD) Quality Systems Manual (QSM) Version 5.1.

SAMPLE IDs AND REQUESTED PARAMETERS

Sample ID	Matrix	COMMENTS
BRLTN03-MW01D-02	Water	MS/MSD
AASF06-MW03S-02	Water	
BRLTN04-MW01S-02	Water	
BRLTNDG-MW04S-02	Water	
BRLTN04-MW01S-92	Water	FD of BRLTN04-MW01S-02
BRLTN-071319-FB	Water	Field blank
BRLTNUP-MW01D-02	Water	
BRLTNDG-MW02S-02	Water	
BRLTNDG-MW05S-02	Water	
BRLTNDG-MW03D-02	Water	
BRLTN-071419-FB	Water	Field blank
BRLTNDG-MW05D-02	Water	
BRLTNDG-MW03S-02	Water	
BRLTN-071419-EB	Water	Equipment blank
BRLTN04-MW01D-02	Water	MS/MSD

Note: All samples listed above were analyzed for the PFAS method listed in the table below.

EXTRACTION, ANALYTICAL, AND REPORTING DETAILS

Parameter	Matrix	Prep Method	Analytical Method	Units
PFAS	Water	EPA 537 Modified*	EPA 537 Modified	ng/l

ng/l = nanogram per liter

*PFAS by LC/MS/MS compliant with QSM 5.1 Table B-15

EVALUATION CRITERIA

The Level IV data package submitted by the laboratory has been reviewed and verified following the guidelines outlined in the project-specific UFP-QAPP and DoD QSM 5.1. Data qualification was performed following the spirit of the National Functional Guidelines for Organic Data Review even though this document does not specifically include the method for PFAS.

Information reviewed in the data packages included sample results; field and laboratory quality control results; instrument calibration; calibration verifications; case narratives; sample receipt forms, and chain-of-custody (COC) forms. The analyses and findings presented in this report are based on the reviewed information, and whether guidelines in the associated analytical method, DoD QSM and QAPP were met. It should be noted that the final approved QAPP for this project indicated TestAmerica Sacramento was the primary laboratory. However, due to capacity issues with the laboratory, all samples were sent to and analyzed by, ELLE. Therefore, the accuracy tolerances reported in the data packages do not match those listed in the project QAPP. Per the DOD QSM 5.1,

statistically derived in-house tolerances should be used for PFAS analysis. As these tolerances differ between laboratories, the limits listed in the analytical reports from ELLE were used to evaluate accuracy.

External Injection Standard (EIS) responses were only used to qualify data when the recovery was excessively high or excessively low. Data associated with EIS recoveries below 10% or above 190% were rejected. Data associated with EIS recoveries below 20% but at or above 10%, or above 180% but at or below 190%, were qualified "J" as estimated. At these extremes, the associated sample data were considered impacted and estimated, or significantly impacted and rejected. Data associated with EIS recoveries between 20% and 180% were not considered significantly impacted and no data qualifiers were applied for EIS recoveries within this range.

A table detailing the data qualifiers applied, removed, or changed for the samples in this SDG as a result of the data validation process is included at the end of this report.

PFAS

General

The PFAS portion of this SDG consisted of seventeen (17) samples, including eleven (11) environmental water samples, two (2) FBs, one (1) EB, one (1) FD, and one (1) matrix spike/matrix spike duplicate (MS/MSD) set. The samples were collected on July 12 – 14, 2019 and were analyzed for the following target list of 24 PFAS analytes as specified in the project-specific UFP-QAPP.

Analyte	CAS Number
Perfluorobutanoic acid (PFBA)	375-22-4
Perfluoropentanoic acid (PFPeA)	2706-90-3
Perfluorohexanoic acid (PFHxA)	307-24-4
Perfluoroheptanoic acid (PFHpA)	375-85-9
Perfluorooctanoic acid (PFOA)	335-67-1
Perfluorononanoic acid (PFNA)	375-95-1
Perfluorodecanoic acid (PFDA)	335-76-2
Perfluoroundecanoic acid (PFUnA)	2058-94-8
Perfluorododecanoic acid (PFDoA)	307-55-1
Perfluorotridecanoic Acid (PFTriA)	72629-94-8
Perfluorotetradecanoic acid (PFTeA)	376-06-7
Perfluorobutanesulfonic acid (PFBS)	375-73-5
Perfluorohexanesulfonic acid (PFHxS)	355-46-4
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8
Perfluorooctanesulfonic acid (PFOS)	1763-23-1
Perfluorodecanesulfonic acid (PFDS)	335-77-3
Perfluorooctane Sulfonamide (PFOSA)	754-91-6

Analyte	CAS Number
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	2991-50-6
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	2355-31-9
1H,1H,2H,2H-perfluorooctane sulfonate (6:2 FTS)	27619-97-2
1H,1H,2H,2H-perfluorodecane sulfonate (8:2 FTS)	39108-34-4
1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2 FTS)	757124-72-4
Perflouro-1-nonanesulfonate (PFNS)	68259-12-1
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4

The PFAS analyses were performed in accordance with U.S. EPA Method 537 Modified (PFAS by LC/MS/MS Compliant with QSM 5.1 Table B-15). All samples in this SDG were analyzed following the procedures outlined in the DoD QSM, version 5.1 and the project-specific UFP-QAPP with exception of the previously noted accuracy tolerances.

The samples were prepared and analyzed within the holding time required by the method. The samples were prepared and analyzed in three batches. The samples were analyzed on one instrument under one initial calibration (ICAL). Some of the samples were reanalyzed due to QC related deficiencies. The laboratory reported the most compliant run for each sample. Only the final reported analyses and the associated QC are discussed in this report.

Accuracy

Accuracy was evaluated using the percent recovery (%R) obtained from the laboratory control sample (LCS), matrix spike/matrix spike duplicate (MS/MSD), the Extracted Internal Standard (EIS) analytes (also referred to as surrogates in the laboratory report), and Injection Internal Standard (IIS) analytes. Sample BRLTN04-MW01D-02 was designated on the COC for MS/MSD analysis.

All LCS recoveries were within acceptance criteria except as follows:

Batch # 19202002

Analyte	LCS %R	Criteria
PFOSA	67	73-121%

The associated sample results for PFOSA were qualified as estimated ("J" if detected or "UJ" if non-detect) due to the potential low bias.

All MS and MSD recoveries were within acceptance criteria except as follows.

Analyte	MS %R	MSD %R	Criteria
PFBA	47	64	84-135%
PFOSA	69	62	73-121%

The parent sample concentration for PFBA was significantly greater than (more than 4 times) the amount spiked, resulting in the anomalous recoveries. Therefore, no corrective action was necessary for PFBA. The non-detected result of FOSA in the parent sample was qualified "UJ" as estimated due to the potential low bias.

All IIS recoveries were within acceptance criteria except as follows.

IIS	Sample ID	%R	Criteria
13C3-PFBA	BRLTNG-MW02S-02	29	50-150%
13C3-PFBA	BRLTNG-MW04S-02	7.7	
13C4-PFOS	BRLTNG04-MW01S-02	35	
13C4-PFOS	BRLTNG04-MW01S-92	35	

Qualification of the data is not necessary since IIS recovery only impacts EIS response.

All extracted IS analytes were within acceptance criteria except as follows:

Sample ID	Dilution	Extracted Internal Standard	%R	Criteria
AASF06-MW03S-02	1x	13C2-4:2-FTS	248	20-180%
BRLTN04-MW01S-02	1x	13C4-PFBA	8	
BRLTN04-MW01S-02	1x	13C2-4:2-FTS	316	
BRLTNDG-MW04S-02	1x	13C5-PFPeA	207	
BRLTNDG-MW04S-02	1x	13C4-PFBS	472	
BRLTN04-MW01S-92	1x	13C2-PFTeA	9	
BRLTN04-MW01S-92	1x	13C4-PFBA	10	
BRLTN04-MW01S-92	1x	13C2-4:2-FTS	338	
AASF06-MW03S-02	1x	13C2-PFTeA	7	
BRLTNDG-MW02S-02	1x	13C4-PFBS	247	
BRLTN03-MW01D-02	1x	13C2-4:2-FTS	201	

The native target compound associated with the non-compliant EIS 13C4-PFBA in sample BRLTN04-MW01S-92 was qualified "UJ" as estimated. The native target compounds associated with all other non-compliant EIS noted above were qualified "R" as rejected (R) due to the very low or very high recoveries.

Precision

Precision was evaluated using the RPD obtained from the MS/MSD concentrations. Precision was further evaluated by comparing the field duplicate analyte results.

All MS/MSD RPDs were within acceptance criteria.

All field duplicate RPDs were within acceptance criteria.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the DoD QSM and project-specific UFP-QAPP;
- Comparing actual analytical procedures to those described in the DoD QSM and project-specific UFP-QAPP;

- Evaluating holding times; and
- Examining field and laboratory blanks for cross contamination of samples during collection and analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the DoD QSM and project-specific UFP-QAPP. All samples were prepared and analyzed within the holding time required by the method. The following QC elements were also evaluated:

- All ICAL criteria were met.
- All initial calibration verification (ICV) criteria were met.
- All continuing calibration verification (CCV) criteria were met.
- All instrument sensitivity check (ISC) criteria were met.
- Raw data was reviewed for qualitative and quantitative accuracy.
- Calculations were spot-checked and verified.

Three laboratory method blanks were associated with the PFAS analyses in this SDG. The laboratory method blanks were non-detect for all target PFAS analytes.

Source blank BRLTN-FDTAP-SB reported in SDG 2045561 was associated with samples BRLTN03-MW01D-02 and BRLTN04-MW01D-02 in this SDG. The source blank sample consisted of onsite tap water used to rinse all reusable equipment. The source blank was non-detect for all target PFAS except as follows:

Source Blank ID	Analyte	Conc. (ng/L)	LOQ (ng/L)
BRLTN-FDTAP-SB	PFBS	0.39 J	1.8
	PFHpA	0.58 J	1.8
	PFHxS	0.48 J	1.8
	PFHxA	0.79 J	1.8
	PFOSA	1.1 J	2.7
	PFOS	1.0 J	1.8
	PFOA	1.1 J	1.8

All results for the analytes listed above that were detected below the LOQ in samples BRLTN03-MW01D-02 and BRLTN04-MW01D-02 were changed to non-detect at the LOQ. No corrective action was required for non-detect results or detections above the LOQ.

The equipment blank BRLTN-071419-EB in this SDG was only associated with BRLTN04-MW01D-02. The EB was non-detect for all target PFAS, with the following exception:

Analyte	Conc. (ng/L)	LOQ (ng/L)
6:2 FTS	10	4.3

The 6:2FTS result in sample BRLTN04-MW01D-02 was qualified "U" as non-detect at the concentration found.

Three field blanks were associated to the soil samples in this SDG. The field blanks were non-detect for all target PFAS analytes.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

Twelve PFAS results for the samples in this SDG were qualified "R" as rejected and considered unusable. Therefore, the completeness for the PFAS portion of this SDG is 97%, which meets the minimum acceptance criteria of 90%.

COMPARABILITY

All data was generated using contract-specific standard methods and reported with known data quality, type of analysis, units, etc.

SENSITIVITY

The LOD and LOQ values reported for the samples were compared to those listed in the QAPP to ensure that sensitivity requirements were met. Sample LODs and LOQs were adjusted based on dilution and/or initial/final volumes.

The LOD and LOQ values were below the project action limit (PAL) listed in the QAPP for all target PFAS.

DATA USABILITY

The purpose of this data validation report is to ensure the integrity and reliability of analytical laboratory data. The data quality is evaluated based on precision, accuracy, representativeness, comparability, and completeness (PARCC) characteristics of the data. Twelve PFAS results were qualified as rejected due to extreme exceedances in the associated EIS which causes those results to be unusable. All other data is considered usable for the purposes of this project.

DATA QUALIFIER CHANGES

The following data qualifiers were added, removed, or changed as a result of the data validation process:

Sample ID	Analyte	Units	Original Result	Final Result	Reason Code
BRLTN-071319-FB	PFOSA	ng/l	0.89 U	0.89 UJ	L3
BRLTNUP-MW01D-02	PFOSA	ng/l	0.84 U	0.84 UJ	L3
BRLTNDG-MW02S-02	PFOSA	ng/l	0.91 U	0.91 UJ	L3
BRLTNDG-MW05S-02	PFOSA	ng/l	0.89 U	0.89 UJ	L3

Sample ID	Analyte	Units	Original Result	Final Result	Reason Code
BRLTNDG-MW03D-02	PFOSA	ng/l	0.46 J	0.46 J	L3
BRLTN-071419-FB	PFOSA	ng/l	0.83 U	0.83 UJ	L3
BRLTNDG-MW05D-02	PFOSA	ng/l	0.59 J	0.59 J	L3
BRLTN-071419-EB	PFOSA	ng/l	0.85 U	0.85 UJ	L3
BRLTN04-MW01D-02	PFOSA	ng/l	1.0 U	1.0 UJ	M3
AASF06-MW03S-02	4:2FTS	ng/l	0.97 J	0.97 R	I12
AASF06-MW03S-02	PFTeA	ng/l	0.91 U	0.91 R	I12
BRLTN04-MW01S-02	4:2FTS	ng/l	0.51 J	0.51 R	I12
BRLTN04-MW01S-02	PFBA	ng/l	35 U	35 R	I12
BRLTNDG-MW04S-02	PFBS	ng/l	9.9	9.9 R	I12
BRLTNDG-MW04S-02	PFPeA	ng/l	11	11 R	I12
BRLTNDG-MW04S-02	PFPeS	ng/l	14	14 R	I12
BRLTN04-MW01S-92	4:2FTS	ng/l	0.88 U	0.88 R	I12
BRLTN04-MW01S-92	PFBA	ng/l	0.35 U	0.35 UJ	I12
BRLTN04-MW01S-92	PFPeA	ng/l	0.88 U	0.88 R	I12
BRLTNDG-MW02S-02	PFBS	ng/l	14	14 R	I12
BRLTNDG-MW02S-02	PFPeS	ng/l	15	15 R	I12
BRLTN03-MW01D-02	4:2FTS	ng/l	0.91 U	0.91R	I12
BRLTN03-MW01D-02	PFBS	ng/l	0.53 J	1.8 U	B9
BRLTN03-MW01D-02	PFHpA	ng/l	1.6 J	1.8 U	B9
BRLTN03-MW01D-02	PFHxS	ng/l	1.5 J	1.8 U	B9
BRLTN03-MW01D-02	PFOA	ng/l	0.60 J	1.8 U	B9
BRLTN04-MW01D-02	PFHxA	ng/l	0.54 J	2.0 U	B9
BRLTN04-MW01D-02	PFHxS	ng/l	0.58 J	2.0 U	B9
BRLTN04-MW01D-02	6:2FTS	ng/l	15	15 U	B8

DATA QUALIFIER DEFINITIONS

The data qualifiers are defined in Table 36.2 of the project-specific UFP-QAPP, as follows:

R — The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified. The data is unusable.

J — The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

UJ — The analyte was not detected. However, the reported LOD is approximate and may or may not accurately and precisely represent the concentration necessary to detect the analyte in the sample.

U	Analyte was not detected and is reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.

REASON CODE DEFINITIONS

Reason codes were used to document the logic behind all data validation qualifiers. The following reason codes for data qualification were associated with the samples in this SDG:

L3: LCS percent recovery infraction with low bias

M3: MS/MSD percent recovery infraction with low bias

I12: EIS percent recovery infraction with no assignable bias

B8: Equipment blank infraction (Qualified detect)

B9: Source blank infraction (Qualified detect)

DATA VALIDATION SUMMARY REPORT

for samples collected from

BURLINGTON AIR NATIONAL GUARD BASE

SOUTH BURLINGTON, VERMONT

Data Validation by: Sandra de las Fuentes

Report Date: September 10, 2019

Parsons - Austin

INTRODUCTION

The following data validation summary report covers two (2) water samples and one (1) field blank (FB). The samples were collected from Burlington Air National Guard (ANG) Base in South Burlington, Vermont on July 16, 2019. The samples were logged under the following Sample Delivery Group (SDG):

2054140

The samples in this SDG were analyzed for per- and polyfluoroalkyl substances (PFAS) by U.S. EPA Method 537 modified. The following table details the samples included in this SDG and the analytical parameters performed. The field quality control (QC) sample collected in association with this SDG included one (1) FB. No equipment blank was associated with the samples in this SDG because the samples were collected from established wells with dedicated sampling equipment.

All samples were collected by Parsons and were hand delivered on July 16, 2019 to Eurofins Lancaster Laboratories Environmental (ELLE). The samples were received by ELLE in good condition and at an acceptable temperature of 0.6 degrees Celsius.

All samples were prepared and analyzed following the procedures outlined in the project-specific Uniform Federal Policy - Quality Assurance Project Plan (UFP-QAPP) and the Department of Defense (DoD) Quality Systems Manual (QSM) Version 5.1.

SAMPLE IDs AND REQUESTED PARAMETERS

Sample ID	Matrix	COMMENTS
AASF06-MW02S-02	Water	
AASF06-MW01S-02	Water	
BRLTN-071619-FB	Water	Field blank

Note: All samples listed above were analyzed for the PFAS method listed in the table below.

EXTRACTION, ANALYTICAL, AND REPORTING DETAILS

Parameter	Matrix	Prep Method	Analytical Method	Units
PFAS	Water	EPA 537 Modified*	EPA 537 Modified	ng/l

ng/l = nanogram per liter

*PFAS by LC/MS/MS compliant with QSM 5.1 Table B-15

EVALUATION CRITERIA

The Level IV data package submitted by the laboratory has been reviewed and verified following the guidelines outlined in the project-specific UFP-QAPP and DoD QSM 5.1. Data qualification was performed following the spirit of the National Functional Guidelines for Organic Data Review even though this document does not specifically include the method for PFAS.

Information reviewed in the data packages included sample results; field and laboratory quality control results; instrument calibration; calibration verifications; case narratives; sample receipt forms, and chain-of-custody (COC) forms. The analyses and findings presented in this report are based on the reviewed information, and whether guidelines in the associated analytical method, DoD QSM and QAPP were met. It should be noted that the final approved QAPP for this project indicated TestAmerica Sacramento was the primary laboratory. However, due to capacity issues with the laboratory, all samples were sent to and analyzed by, ELLE. Therefore, the accuracy tolerances reported in the data packages do not match those listed in the project QAPP. Per the DOD QSM 5.1, statistically derived in-house tolerances should be used for PFAS analysis. As these tolerances differ between laboratories, the limits listed in the analytical reports from ELLE were used to evaluate accuracy.

External Injection Standard (EIS) responses were only used to qualify data when the recovery was excessively high or excessively low. Data associated with EIS recoveries below 10% or above 190% were rejected. Data associated with EIS recoveries below 20% but at or above 10%, or above 180% but at or below 190%, were qualified "J" as estimated. At these extremes, the associated sample data were considered impacted and estimated, or significantly impacted and rejected. Data associated with EIS recoveries between 20% and 180% were not considered significantly impacted and no data qualifiers were applied for EIS recoveries within this range.

A table detailing the data qualifiers applied, removed, or changed for the samples in this SDG as a result of the data validation process is included at the end of this report.

PFAS

General

The PFAS portion of this SDG consisted of three (3) samples, including two (2) environmental water samples and one (1) FB. The samples were collected on June 16, 2019 and were analyzed for the following target list of 24 PFAS analytes as specified in the project-specific UFP-QAPP.

Analyte	CAS Number
Perfluorobutanoic acid (PFBA)	375-22-4
Perfluoropentanoic acid (PFPeA)	2706-90-3
Perfluorohexanoic acid (PFHxA)	307-24-4
Perfluoroheptanoic acid (PFHpA)	375-85-9
Perfluorooctanoic acid (PFOA)	335-67-1
Perfluorononanoic acid (PFNA)	375-95-1
Perfluorodecanoic acid (PFDA)	335-76-2
Perfluoroundecanoic acid (PFUnA)	2058-94-8
Perfluorododecanoic acid (PFDoA)	307-55-1
Perfluorotridecanoic Acid (PFTriA)	72629-94-8
Perfluorotetradecanoic acid (PFTeA)	376-06-7
Perfluorobutanesulfonic acid (PFBS)	375-73-5
Perfluorohexanesulfonic acid (PFHxS)	355-46-4
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8
Perfluorooctanesulfonic acid (PFOS)	1763-23-1
Perfluorodecanesulfonic acid (PFDS)	335-77-3
Perfluorooctane Sulfonamide (PFOSA)	754-91-6
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	2991-50-6
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	2355-31-9
1H,1H,2H,2H-perfluorooctane sulfonate (6:2 FTS)	27619-97-2
1H,1H,2H,2H-perfluorodecane sulfonate (8:2 FTS)	39108-34-4
1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2 FTS)	757124-72-4
Perflouro-1-nonanesulfonate (PFNS)	68259-12-1
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4

The PFAS analyses were performed in accordance with U.S. EPA Method 537 Modified (PFAS by LC/MS/MS Compliant with QSM 5.1 Table B-15). All samples in this SDG were analyzed following the procedures outlined in the DoD QSM, version 5.1 and the project-specific UFP-QAPP with exception of the previously noted accuracy tolerances.

The samples were prepared and analyzed within the holding time required by the method. The samples were prepared and analyzed in one batch. The samples were analyzed on one instrument under one initial calibration (ICAL). Some of the samples were reanalyzed due to QC related deficiencies. The laboratory reported the most compliant run for each sample. Only the final reported analyses and the associated QC are discussed in this report.

Accuracy

Accuracy was evaluated using the percent recovery (%R) obtained from the laboratory control sample (LCS), LCS duplicate (LCSD), matrix spike/matrix spike duplicate (MS/MSD), the Extracted Internal Standard (EIS) analytes (also referred to as surrogates in the laboratory report), and Injection Internal Standard (IIS) analytes

All LCS and LCSD recoveries were within acceptance criteria except as follows:

Batch # 19207003

Analyte	LCS %R	LCSD %R	Criteria
PFBA	78	77	81-133%
PFDS	63	55	69-124%
PFDA	75	(78)	78-137%
PFHpS	(85)	76	80-129%
PFHpA	77	73	80-140%
PFNS	(76)	70	71-121%
PFOS	61	63	73-121%
PFOA	76	75	83-138%
PFPeS	80	76	82-132%
PFTriA	(67)	56	67-144%

( ) indicates the recovery met criteria

The results for the analytes listed above in the associated samples AASF06-MW02S-02, AASF06-MW01S-02, and BRLTN-071619-FB were qualified as estimated ("J" if detected or "UJ" if non-detect) due to the potential low bias.

All IIS analytes were within acceptance criteria.

All EIS analytes were within acceptance criteria except as follows:

Sample ID	Dilution	EIS	%R	Criteria
AASF06-MW02S-02	1x	13C2-PFTeDA	6	50-150%
AASF06-MW02S-02	1x	d5-NEtFOSAA	18	50-150%
AASF06-MW01S-02	1x	13C2-4:2-FTS	256	50-150%
AASF06-MW01S-02	1x	13C2-PFTeDA	5	50-150%

The native target compound associated with the non-compliant EIS d5-NEtFOSAA was qualified "J" as estimated in sample AASF06-MW02S-02. The native target compounds associated with all other non-compliant EIS were qualified "R as rejected due to the very high or very low recoveries.

Precision

Precision was evaluated using the RPD obtained from the LCS/LCSD concentrations.

All LCS/LCSD RPDs were within acceptance criteria.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the DoD QSM and project-specific UFP-QAPP;
- Comparing actual analytical procedures to those described in the DoD QSM and project-specific UFP-QAPP;
- Evaluating holding times; and
- Examining field and laboratory blanks for cross contamination of samples during collection and analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the DoD QSM and project-specific UFP-QAPP. All samples were prepared and analyzed within the holding time required by the method. The following QC elements were also evaluated:

- All ICAL criteria were met.
- All initial calibration verification (ICV) criteria were met.
- All continuing calibration verification (CCV) criteria were met.
- All instrument sensitivity check (ISC) criteria were met.
- Raw data was spot-checked for qualitative and quantitative accuracy.
- Calculations were spot-checked and verified.

One laboratory method blank was associated with the PFAS analyses in this SDG. The laboratory method blank was non-detect for all target PFAS analytes.

One field blank was associated with the water samples in this SDG. The field blank was non-detect for all target PFAS analytes.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

Three PFAS results for the samples in this SDG were qualified "R" as rejected and considered unusable. Therefore, the completeness for the PFAS portion of this SDG is 96%, which meets the minimum acceptance criteria of 90%.

COMPARABILITY

All data was generated using contract-specific standard methods and reported with known data quality, type of analysis, units, etc.

SENSITIVITY

The LOD and LOQ values reported for the samples were compared to those listed in the QAPP to ensure that sensitivity requirements were met. The LODs and LOQs were adjusted based on dilution and/or initial/final volumes.

The LOD and LOQ was less than the project action limit (PAL) listed in the QAPP for all target PFAS.

DATA USABILITY

The purpose of this data validation report is to ensure the integrity and reliability of analytical laboratory data. The data quality is evaluated based on precision, accuracy, representativeness, comparability, and completeness (PARCC) characteristics of the data. Three PFAS results were qualified as rejected due to extreme exceedances in the associated EIS and were considered unusable. All other data is considered usable for the purposes of this project.

DATA QUALIFIER CHANGES

The following data qualifiers were added, removed, or changed as a result of the data validation process:

Sample ID	Analyte	Units	Original Result	Final Result	Reason Code
AASF06-MW02S-02	4:2-FTS	ng/l	0.89 U	0.89 R	I12
AASF06-MW02S-02	NEtFOSAA	ng/l	0.89 U	0.89 UJ	I12
AASF06-MW02S-02	PFTeA	ng/l	0.89 U	0.89 R	I12
AASF06-MW02S-02	PFBA	ng/l	22	22 J	L3
AASF06-MW02S-02	PFHpA	ng/l	2.2	2.2 J	L3
AASF06-MW02S-02	PFOA	ng/l	3.8	3.8 J	L3
AASF06-MW02S-02	PFOS	ng/l	2.1	2.1 J	L3
AASF06-MW02S-02	PFPeS	ng/l	0.51 J	0.51 J	L3
AASF06-MW02S-02	PFDA	ng/l	0.89 U	0.89 UJ	L3
AASF06-MW02S-02	PFDS	ng/l	0.89 U	0.89 UJ	L3
AASF06-MW02S-02	PFHpS	ng/l	0.89 U	0.89 UJ	L3
AASF06-MW02S-02	PFNS	ng/l	0.89 U	0.89 UJ	L3
AASF06-MW02S-02	PFTriA	ng/l	0.89 U	0.89 UJ	L3
AASF06-MW01S-02	PFBA	ng/l	9.3	9.3 J	L3
AASF06-MW01S-02	PFTeA	ng/l	1.2 U	1.2 R	I12
AASF06-MW01S-02	PFHpA	ng/l	1.7 J	1.7 J	L3
AASF06-MW01S-02	PFPeS	ng/l	1.2 U	1.2 UJ	L3
AASF06-MW01S-02	PFOS	ng/l	8.5	8.5 J	L3

Sample ID	Analyte	Units	Original Result	Final Result	Reason Code
AASF06-MW01S-02	PFDA	ng/l	1.2 U	1.2 UJ	L3
AASF06-MW01S-02	PFDS	ng/l	1.2 U	1.2 UJ	L3
AASF06-MW01S-02	PFHpS	ng/l	1.2 U	1.2 UJ	L3
AASF06-MW01S-02	PFNS	ng/l	1.2 U	1.2 UJ	L3
AASF06-MW01S-02	PFOA	ng/l	3.1	3.1 J	L3
AASF06-MW01S-02	PFTriA	ng/l	1.2 U	1.2 UJ	L3
BRLTN-071619-FB	PFBA	ng/l	3.6 U	3.6 UJ	L3
BRLTN-071619-FB	PFDA	ng/l	0.91 U	0.91 UJ	L3
BRLTN-071619-FB	PFDS	ng/l	0.91 U	0.91 UJ	L3
BRLTN-071619-FB	PFHpA	ng/l	0.91 U	0.91 UJ	L3
BRLTN-071619-FB	PFHpS	ng/l	0.91 U	0.91 UJ	L3
BRLTN-071619-FB	PFNS	ng/l	0.91 U	0.91 UJ	L3
BRLTN-071619-FB	PFOA	ng/l	0.91 U	0.91 UJ	L3
BRLTN-071619-FB	PFOS	ng/l	0.91 U	0.91 UJ	L3
BRLTN-071619-FB	PFPeS	ng/l	0.91 U	0.91 UJ	L3
BRLTN-071619-FB	PFTriA	ng/l	0.91 U	0.91 UJ	L3

DATA QUALIFIER DEFINITIONS

The data qualifiers are defined in Table 36.2 of the project-specific UFP-QAPP, as follows:

R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified. The data is unusable.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected. However, the reported LOD is approximate and may or may not accurately and precisely represent the concentration necessary to detect the analyte in the sample.
U	Analyte was not detected and is reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.

REASON CODE DEFINITIONS

Reason codes were used to document the logic behind all data validation qualifiers. The following reason codes for data qualification were associated with the samples in this SDG:

I12: EIS percent recovery infraction with no assignable bias

L3: LCS percent recovery infraction with a low bias

DATA VALIDATION SUMMARY REPORT

for samples collected from

BURLINGTON AIR NATIONAL GUARD BASE

SOUTH BURLINGTON, VERMONT

Data Validation by: Sandra de las Fuentes

Report Date: September 20, 2019

Parsons - Austin

INTRODUCTION

The following data validation summary report covers three (3) water samples. The samples were collected from Burlington Air National Guard (ANG) Base in South Burlington, Vermont on July 16, 2019. The samples were logged under the following Sample Delivery Group (SDG):

2054675

The samples in this SDG were analyzed for per- and polyfluoroalkyl substances (PFAS) by U.S. EPA Method 537 modified. The following table details the samples included in this SDG and the analytical parameters performed. No field quality control (QC) samples were reported in this SDG. It should be noted that the associated field blank BRLTN-071619-FB was reported in SDG 2054140. No equipment blank was associated with the samples in this SDG because the samples were collected using disposable equipment.

All samples were collected by Parsons and were hand delivered on July 17, 2019 to Eurofins Lancaster Laboratories Environmental (ELLE). The samples were received by ELLE in good condition and at an acceptable temperature of 0.7 degrees Celsius. Note: two additional samples (BRLTNUP-006-SW and BRLTNDG-019-SW) were collected and sent to ELLE, although they were cancelled at Parsons' request and were not analyzed.

All samples were prepared and analyzed following the procedures outlined in the project-specific Uniform Federal Policy - Quality Assurance Project Plan (UFP-QAPP) and the Department of Defense (DoD) Quality Systems Manual (QSM) Version 5.1.

SAMPLE IDs AND REQUESTED PARAMETERS

Sample ID	Matrix	COMMENTS
BRLTNDG-003-ST	Water	
BRLTNDG-004-ST	Water	
BRLTNDG-006-ST	Water	

Note: All samples listed above were analyzed for the PFAS method listed in the table below.

EXTRACTION, ANALYTICAL, AND REPORTING DETAILS

Parameter	Matrix	Prep Method	Analytical Method	Units
PFAS	Water	EPA 537 Modified*	EPA 537 Modified	ng/l

ng/l = nanogram per liter

*PFAS by LC/MS/MS compliant with QSM 5.1 Table B-15

EVALUATION CRITERIA

The Level IV data package submitted by the laboratory has been reviewed and verified following the guidelines outlined in the project-specific UFP-QAPP and DoD QSM 5.1. Data qualification was performed following the spirit of the National Functional Guidelines for Organic Data Review even though this document does not specifically include the method for PFAS.

Information reviewed in the data packages included sample results; field and laboratory quality control results; instrument calibration; calibration verifications; case narratives; sample receipt forms, and chain-of-custody (COC) forms. The analyses and findings presented in this report are based on the reviewed information, and whether guidelines in the associated analytical method, DoD QSM and QAPP were met. It should be noted that the final approved QAPP for this project indicated TestAmerica Sacramento was the primary laboratory. However, due to capacity issues with the laboratory, all samples were sent to and analyzed by, ELLE. Therefore, the accuracy tolerances reported in the data packages do not match those listed in the project QAPP. Per the DOD QSM 5.1, statistically derived in-house tolerances should be used for PFAS analysis. As these tolerances differ between laboratories, the limits listed in the analytical reports from ELLE were used to evaluate accuracy.

External Injection Standard (EIS) responses were only used to qualify data when the recovery was excessively high or excessively low. Data associated with EIS recoveries below 10% or above 190% were rejected. Data associated with EIS recoveries below 20% but at or above 10%, or above 180% but at or below 190%, were qualified "J" as estimated. At these extremes, the associated sample data were considered impacted and estimated, or significantly impacted and rejected. Data associated with EIS recoveries between 20% and 180% were not considered significantly impacted and no data qualifiers were applied for EIS recoveries within this range.

A table detailing the data qualifiers applied, removed, or changed for the samples in this SDG as a result of the data validation process is included at the end of this report.

PFAS

General

The PFAS portion of this SDG consisted of three (3) samples. The samples were collected on June 17, 2019 and were analyzed for the following target list of 24 PFAS analytes as specified in the project-specific UFP-QAPP.

Analyte	CAS Number
Perfluorobutanoic acid (PFBA)	375-22-4
Perfluoropentanoic acid (PFPeA)	2706-90-3
Perfluorohexanoic acid (PFHxA)	307-24-4
Perfluoroheptanoic acid (PFHpA)	375-85-9
Perfluorooctanoic acid (PFOA)	335-67-1
Perfluorononanoic acid (PFNA)	375-95-1
Perfluorodecanoic acid (PFDA)	335-76-2
Perfluoroundecanoic acid (PFUnA)	2058-94-8
Perfluorododecanoic acid (PFDoA)	307-55-1
Perfluorotridecanoic Acid (PFTriA)	72629-94-8
Perfluorotetradecanoic acid (PFTeA)	376-06-7
Perfluorobutanesulfonic acid (PFBS)	375-73-5
Perfluorohexanesulfonic acid (PFHxS)	355-46-4
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8
Perfluorooctanesulfonic acid (PFOS)	1763-23-1
Perfluorodecanesulfonic acid (PFDS)	335-77-3
Perfluorooctane Sulfonamide (PFOSA)	754-91-6
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	2991-50-6
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	2355-31-9
1H,1H,2H,2H-perfluorooctane sulfonate (6:2 FTS)	27619-97-2
1H,1H,2H,2H-perfluorodecane sulfonate (8:2 FTS)	39108-34-4
1H,1H,2H,2H-perfluorohexanesulfonic acid (4:2 FTS)	757124-72-4
Perflouro-1-nonanesulfonate (PFNS)	68259-12-1
Perfluoropentanesulfonic acid (PFPeS)	2706-91-4

The PFAS analyses were performed in accordance with U.S. EPA Method 537 Modified (PFAS by LC/MS/MS Compliant with QSM 5.1 Table B-15). All samples in this SDG were analyzed following the procedures outlined in the DoD QSM, version 5.1 and the project-specific UFP-QAPP with exception of the previously noted accuracy tolerances.

The samples were prepared and analyzed within the holding time required by the method. The samples were prepared and analyzed in one batch. The samples were analyzed on one instrument under one initial calibration (ICAL). Some of the samples were reanalyzed due to QC related deficiencies. The laboratory reported the most compliant run for each sample. Only the final reported analyses and the associated QC are discussed in this report.

Accuracy

Accuracy was evaluated using the percent recovery (%R) obtained from the laboratory control sample (LCS), LCS duplicate (LCSD), the Extracted Internal Standard (EIS) analytes (also referred to as surrogates in the laboratory report), and Injection Internal Standard (IIS) analytes

All LCS and LCSD recoveries were within acceptance criteria except as follows:

Batch # 19207003

Analyte	LCS %R	LCSD %R	Criteria
PFOSA	63	62	73-121%

The results for the analytes listed above in the associated samples were non-detect, and therefore qualified "UJ" as estimated due to the potential low bias.

All IIS analytes were within acceptance criteria.

All EIS analytes were within acceptance criteria except as follows:

Sample ID	Dilution	EIS	%R	Criteria
BRLTNDG-003-ST	1x	13C2-4:2-FTS	202	20-180%
BRLTNDG-004-ST	1x	13C2-4:2-FTS	266	
BRLTNDG-006-ST	1x	13C2-4:2-FTS	260	
BRLTNDG-004-ST	1x	13C2-6:2-FTS	235	
BRLTNDG-006-ST	1x	13C2-6:2-FTS	220	
BRLTNDG-003-ST	1x	13C2-PFTeA	4	

The native target compounds associated with the non-compliant EIS noted above were qualified "R" as rejected and considered unusable.

Precision

Precision was evaluated using the RPD obtained from the LCS/LCSD analyte results.

All LCS/LCSD RPDs were within acceptance criteria.

Representativeness

Representativeness expresses the degree to which sample data accurately and precisely represents actual site conditions. Representativeness has been evaluated by:

- Comparing the COC procedures to those described in the DoD QSM and project-specific UFP-QAPP;
- Comparing actual analytical procedures to those described in the DoD QSM and project-specific UFP-QAPP;
- Evaluating holding times; and
- Examining field and laboratory blanks for cross contamination of samples during collection and analysis.

The samples in this SDG were analyzed following the COC and the analytical procedures described in the DoD QSM and project-specific UFP-QAPP. All samples were prepared and analyzed within the holding time required by the method. The following QC elements were also evaluated:

- All ICAL criteria were met.
- All initial calibration verification (ICV) criteria were met.
- All continuing calibration verification (CCV) criteria were met.
- All instrument sensitivity check (ISC) criteria were met.
- Raw data was spot-checked for qualitative and quantitative accuracy.
- Calculations were spot-checked and verified.

One laboratory method blank was associated with the PFAS analyses in this SDG. The laboratory method blank was non-detect for all target PFAS analytes.

One field blank, BRLTN-071619-FB, reported in SDG 2054140 was associated with the water samples in this SDG. The field blank was non-detect for all target PFAS analytes.

Completeness

Completeness has been evaluated by comparing the total number of samples collected with the total number of samples with valid analytical data.

Six PFAS results for the samples in this SDG were qualified as rejected and flagged "R". Therefore, the completeness for the PFAS portion of this SDG is 92%, which meets the minimum acceptance criteria of 90%.

COMPARABILITY

All data was generated using contract-specific standard methods and reported with known data quality, type of analysis, units, etc.

SENSITIVITY

The LOD and LOQ values reported for the samples were compared to those listed in the QAPP to ensure that sensitivity requirements were met. The LODs and LOQs were adjusted based on dilution and/or initial/final volumes.

The LOD and LOQ was less than the project action limit (PAL) listed in the QAPP for all target PFAS.

DATA USABILITY

The purpose of this data validation report is to ensure the integrity and reliability of analytical laboratory data. The data quality is evaluated based on precision, accuracy, representativeness, comparability, and completeness (PARCC) characteristics of the data. Six PFAS results were qualified as rejected due to extreme exceedances in the associated

EIS and considered unusable. All other data is considered usable for the purposes of this project.

DATA QUALIFIER CHANGES

The following data qualifiers were added, removed, or changed as a result of the data validation process:

Sample ID	Analyte	Units	Original Result	Final Result	Reason Code
BRLTNDG-003-ST	PFOSA	ng/l	0.90 U	0.90 UJ	L3
BRLTNDG-004-ST	PFOSA	ng/l	0.90 U	0.90 UJ	L3
BRLTNDG-006-ST	PFOSA	ng/l	0.98 U	0.98 UJ	L3
BRLTNDG-003-ST	4:2-FTS	ng/l	0.90 U	0.90 R	I12
BRLTNDG-004-ST	4:2-FTS	ng/l	0.90 U	0.90 R	I12
BRLTNDG-006-ST	4:2-FTS	ng/l	0.98 U	0.98 R	I12
BRLTNDG-004-ST	6:2-FTS	ng/l	3.6 U	3.6 R	I12
BRLTNDG-006-ST	6:2-FTS	ng/l	3.9 U	3.9 R	I12
BRLTNDG-003-ST	PFTeA	ng/l	0.90 U	0.90 R	I12

DATA QUALIFIER DEFINITIONS

The data qualifiers are defined in Table 36.2 of the project-specific UFP-QAPP, as follows:

R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified. The data is unusable.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected. However, the reported LOD is approximate and may or may not accurately and precisely represent the concentration necessary to detect the analyte in the sample.
U	Analyte was not detected and is reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.

REASON CODE DEFINITIONS

Reason codes were used to document the logic behind all data validation qualifiers. The following reason codes for data qualification were associated with the samples in this SDG:

I12: EIS percent recovery infraction with no assignable bias

L3: LCS percent recovery infraction with a low bias

DATA VALIDATION SUMMARY REPORT

for samples collected from

BURLINGTON AIR NATIONAL GUARD BASE

SOUTH BURLINGTON, VERMONT

Data Validation by: Katherine LaPierre

Report Date: November 19, 2019

Parsons - Austin

INTRODUCTION

The following data validation summary report covers two (2) investigation derived waste (IDW) soil sample collected from Burlington Air National Guard (ANG) Base in South Burlington, Vermont. The initial IDW soil sample was collected on July 8, 2019 and a second sample from the same IDW source was collected July 15, 2019. The samples were logged under the following Sample Delivery Groups (SDGs):

2052698 2053721 89530

The following table details the samples included in this report, the analytical parameters performed on each, and the SDG the analyses were reported in. No field quality control (QC) samples were associated with IDW. Percent moisture was determined for the IDW soil samples for all "total" parameters.

All samples were collected by Parsons and were shipped to Eurofins Lancaster Laboratories Environmental (ELLE). The planning documents for this site originally indicated the samples would be analyzed by TestAmerica in Sacramento, California (TA-Sacramento). However, upon initiation of the project, TA-Sacramento did not have sufficient capacity to meet the requirements of the project and therefore, the work was transferred to ELLE. ELLE performed all analyses related to this project, except as noted below. The samples were received by ELLE in good condition and at acceptable temperatures ranging from 0.9 to 3.5 degrees Celsius. An aliquot of the soil sample collected July 8, 2019 was shipped by ELLE to Agriculture and Priority Pollutants Laboratory (APPL) in Clovis, California for the analysis of Herbicides. Due to a shortage of diazol, ELLE was unable to perform the herbicide analysis, so this parameter was performed by APPL. The sample was received by APPL in good condition and at a temperature of 2.3 degrees Celsius, which was within the acceptable range.

All samples were prepared and analyzed following the procedures outlined in the project-specific Uniform Federal Policy - Quality Assurance Project Plan (UFP-QAPP) and the Department of Defense (DoD) Quality Systems Manual (QSM) Version 5.1.

SAMPLE IDs, REQUESTED PARAMETERS, and SDG

Parameter	BRLTN-IDW-S01	BRLTN-IDW-S02	SDG
PFAS	X		2052698
PCBs (Total)	X		2052698
TCLP VOCs	X		2052698
TCLP SVOCs	X		2052698
TCLP Metals	X		2052698
TCLP Mercury	X		2052698
TCLP Pesticides	X		2052698
Reactivity - Cyanide	X		2052698
Reactivity – Sulfide	X		2052698
Ignitability	X		2052698
Herbicides (Total)	X		89530 (APPL)
VOCs (Total)		X	2053721
SVOCs (Total)		X	2053721

EXTRACTION, ANALYTICAL, AND REPORTING DETAILS

Parameter	Matrix	Prep Method	Analytical Method	Units
PFAS	Soil	EPA 537 Modified	EPA 537 Modified*	ng/g
PCBs (Total)	Soil	SW3546	SW8082A	µg/kg
VOCs (Total)	Soil	SW5035A	SW8260C	µg/kg
SVOCs (Total)	Soil	SW3546	SW8270D	µg/kg
TCLP VOCs	Soil	SW1311 / SW5030B	SW8260C	µg/L
TCLP SVOCs	Soil	SW1311 / SW3510C	SW8270D	mg/L
TCLP Metals	Soil	SW1311 / SW3010A	SW6010C	mg/L
TCLP Mercury	Soil	SW1311 / SW7470A	SW7470A	mg/L
TCLP Pesticides	Soil	SW1311 / SW3510C	SW8081B	mg/L
Reactivity - Cyanide	Soil	None	SW-846 Chapter 7.3	mg/kg
Reactivity - Sulfide	Soil	None	SW-846 Chapter 7.3 / SW9034	mg/kg
Ignitability	Soil	None	40 CFR, Part 261.21	none
Herbicides (Total)	Soil	SW8151A	SW8151A	mg/kg

* PFAS by LC/MS/MS Compliant with QSM 5.1 Table B-15

EVALUATION CRITERIA

A Level 2A validation was performed on all IDW data. The data packages submitted by the laboratories were reviewed and verified following the guidelines outlined in the project-

specific UFP-QAPP and DoD QSM 5.1. Data qualification was performed in accordance with the National Functional Guidelines (NFG) for Organic Superfund Methods Data Review and the NFG for Inorganic Superfund Methods Data Review, both published in January 2017. For methods not included in these documents, data was reviewed and qualified following the spirit of the NFG.

Information reviewed in the data packages included sample results; laboratory quality control results; case narratives; sample receipt forms, and chain-of-custody (COC) forms. The analyses and findings presented in this report are based on the reviewed information, and whether guidelines in the associated analytical method, DoD QSM and QAPP were met. It should be noted that the final approved QAPP for this project indicated TestAmerica Sacramento was the primary laboratory. However, due to capacity issues with the laboratory, all samples were sent to ELLE. As previously mentioned, the herbicide analysis was performed by APPL and all other parameters were performed by ELLE. Therefore, the tolerances and laboratory-specific detection limits (DL), limits of detection (LOD), and limits of quantitation (LOQ) reported in the data packages may not match those listed in the project QAPP. The limits listed in the analytical reports were used to evaluate accuracy and precision.

A table detailing the data qualifiers applied, removed, or changed for the samples in this SDG as a result of the data validation process is included at the end of this report.

PFAS

General

The PFAS portion of this SDG consisted of one IDW soil sample. The sample was collected on July 8, 2019 and was analyzed for the following reduced list of 14 PFAS compounds as required by the waste disposal company.

Analyte	CAS Number
Perfluorohexanoic acid (PFHxA)	307-24-4
Perfluoroheptanoic acid (PFHpA)	375-85-9
Perfluorooctanoic acid (PFOA)	335-67-1
Perfluorononanoic acid (PFNA)	375-95-1
Perfluorodecanoic acid (PFDA)	335-76-2
Perfluoroundecanoic acid (PFUnA)	2058-94-8
Perfluorododecanoic acid (PFDoA)	307-55-1
Perfluorotridecanoic acid (PFTriA)	72629-94-8
Perfluorotetradecanoic acid (PFTeA)	376-06-7
Perfluorobutanesulfonic acid (PFBS)	375-73-5
Perfluorohexanesulfonic acid (PFHxS)	355-46-4
Perfluorooctanesulfonic acid (PFOS)	1763-23-1
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	2991-50-6
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	2355-31-9

The PFAS analyses were performed in accordance with U.S. EPA Method 537 Version 1.1 Modified (PFAS by LC/MS/MS Compliant with QSM 5.1 Table B-15). All analyses were performed following the procedures outlined in the DoD QSM, version 5.1 and as requested on the COC.

Quality Control

The sample was prepared and analyzed within the holding time required by the method.

The method blank was non-detect for all target PFAS.

The laboratory control spike (LCS) and LCS duplicate (LCSD) met accuracy and precision criteria for all target PFAS.

All Extracted Internal Standards, which the laboratory report refers to as surrogates, met criteria.

No data quality issues were found for the PFAS analyses in this data set and no data was qualified as a result of the review.

POLYCHLORINATED BIPHENYLS

General

The PCB portion of this SDG consisted of one IDW soil sample. The sample was collected on July 8, 2019 and was analyzed for the standard list of PCB compounds as required by the waste disposal company.

The PCB analyses were performed in accordance with U.S. EPA SW-846 Method 8082A and the DoD QSM, version 5.1, and as requested on the COC.

Quality Control

The sample was prepared and analyzed within the holding time required by the method.

The method blank was non-detect for all target PCBs.

The LCS met accuracy criteria for both PCBs spiked, PCB-1016 and PCB-1260.

All surrogate spike recoveries met criteria.

No data quality issues were found for the PCBs analyses in this data set and no data was qualified as a result of the review.

TOTAL VOLATILE ORGANIC COMPOUNDS

General

The total VOC portion of this SDG consisted of one IDW soil sample. The sample was collected on July 15, 2019 and was analyzed for the standard full laboratory list of VOCs as required by the waste disposal company.

The VOC analyses were performed in accordance with U.S. EPA SW-846 Method 8260C and the DoD QSM, version 5.1, and as requested on the COC.

Quality Control

The sample was prepared and analyzed within the holding time required by the method.

The method blank was non-detect for all target VOCs.

The LCS/LCSD met accuracy and precision criteria for all target VOCs.

All surrogate spike recoveries met criteria.

No data quality issues were found for the total VOC analyses in this data set and no data was qualified as a result of the review.

TCLP VOLATILE ORGANIC COMPOUNDS

General

The TCLP VOC portion of this SDG consisted of one IDW soil sample. The sample was collected on July 8, 2019 and was analyzed for the TCLP list of VOCs as required by the waste disposal company.

The sample was leached in accordance with U.S. EPA SW-846 Method 1311. The VOC analyses were performed in accordance with U.S. EPA SW-846 Method 8260C and the DoD QSM, version 5.1, and as requested on the COC.

Quality Control

The sample was prepared and analyzed within the holding time required by the method.

The method blank was non-detect for all target VOCs.

The LCS/LCSD met accuracy and precision criteria for all target VOCs.

All surrogate spike recoveries met criteria.

The laboratory performed a matrix spike/matrix spike duplicate (MS/MSD) pair on the IDW soil sample leachate to meet batch QC requirements. All MS/MSD accuracy criteria were met, with the following exceptions:

Sample ID	Analyte	MS %R	MSD %R	Criteria
BRLTN-IDW-S01	Vinyl chloride	26	19	58-137%

The parent sample result for vinyl chloride was qualified “UJ” as estimated due to the possible low bias. Due to the nature of the sample, rejection of the data was not warranted.

Precision was evaluated using the relative percent difference (RPD) obtained from the MS/MSD concentrations. All target TCLP VOCs met precision criteria, except for the following:

Sample ID	Analyte	RPD	Criteria
BRLTN-IDW-S01	Vinyl chloride	33	RPD ≤ 20

The parent sample result for vinyl chloride was previously qualified “UJ” as estimated due to the low MS/MSD recoveries. Therefore, no additional corrective action was necessary.

No additional data quality issues were found for the TCLP VOC analyses in this data set. One result for vinyl chloride was qualified as estimated and considered usable for the purposes of this project.

TOTAL SEMIVOLATILE ORGANIC COMPOUNDS

General

The total SVOC portion of this SDG consisted of one IDW soil sample. The sample was collected on July 15, 2019 and was analyzed for the standard full laboratory list of SVOCs as required by the waste disposal company.

The SVOC analyses were performed in accordance with U.S. EPA SW-846 Method 8270D and the DoD QSM, version 5.1, and as requested on the COC.

Quality Control

The sample was prepared and analyzed within the holding time required by the method.

The method blank was non-detect for all target SVOCs.

The LCS met accuracy criteria for all target SVOCs.

All surrogate spike recoveries met criteria.

No data quality issues were found for the total SVOC analyses in this data set and no data was qualified as a result of the review.

TCLP SEMIVOLATILE ORGANIC COMPOUNDS

General

The TCLP SVOC portion of this SDG consisted of one IDW soil sample. The sample was collected on July 8, 2019 and was analyzed for the TCLP list of SVOCs as required by the waste disposal company.

The sample was leached in accordance with U.S. EPA SW-846 Method 1311. The SVOC analyses were performed in accordance with U.S. EPA SW-846 Method 8270D and the DoD QSM, version 5.1, and as requested on the COC.

Quality Control

The sample was prepared and analyzed within the holding time required by the method.

The method blank was non-detect for all target SVOCs.

The LCS/LCSD met accuracy and precision criteria for all target SVOCs.

All surrogate spike recoveries met criteria.

No data quality issues were found for the TCLP SVOC analyses in this data set and no data was qualified as a result of the review.

TCLP METALS

General

The TCLP metals portion of this SDG consisted of one IDW soil sample. The sample was collected on July 8, 2019 and was analyzed for the TCLP list of metals as required by the waste disposal company.

The sample was leached in accordance with U.S. EPA SW-846 Method 1311. The metals analyses were performed in accordance with U.S. EPA SW-846 Method 6010C and the DoD QSM, version 5.1, and as requested on the COC.

Quality Control

The sample was prepared and analyzed within the holding time required by the method.

The method blank was non-detect for all target metals, with the following exception:

Batch ID	Analyte	Conc. (mg/L)	LOQ (mg/L)
191931404502	Barium	0.0021 J	0.0050

The sample concentration for barium was above the LOQ and significantly greater than the amount found in the method blank. Therefore, no corrective action was necessary.

The LCS met accuracy criteria for all target metals.

The laboratory performed a MS/MSD pair on the IDW soil sample leachate to meet batch QC requirements. All MS/MSD accuracy and precision criteria were met, with the following exceptions:

Sample ID	Analyte	MS %R	MSD %R	Criteria
BRLTN-IDW-S01	Silver	78	76	84-115%

The parent sample result for silver was qualified “UJ” as estimated due to the possible low bias.

The laboratory performed an analytical duplicate on sample BRLTN-IDW-S01. All analytical duplicate precision met criteria.

No additional data quality issues were found for the TCLP metals analyses in this data set. One result for silver was qualified as estimated and considered usable for the purposes of this project.

TCLP MERCURY

General

The TCLP mercury portion of this SDG consisted of one IDW soil sample. The sample was collected on July 8, 2019 and was analyzed for the TCLP mercury as required by the waste disposal company.

The sample was leached in accordance with U.S. EPA SW-846 Method 1311. The mercury analyses were performed in accordance with U.S. EPA SW-846 Method 7470A and the DoD QSM, version 5.1, and as requested on the COC.

Quality Control

The sample was prepared and analyzed within the holding time required by the method.

The method blank was non-detect for mercury.

The LCS met accuracy criteria for mercury.

No data quality issues were found for the TCLP mercury analyses in this data set and no data was qualified as a result of the review.

TCLP PESTICIDES

General

The TCLP pesticides portion of this SDG consisted of one IDW soil sample. The sample was collected on July 8, 2019 and was analyzed for the TCLP pesticides as required by the waste disposal company.

The sample was leached in accordance with U.S. EPA SW-846 Method 1311. The pesticide analyses were performed in accordance with U.S. EPA SW-846 Method 8081B and the DoD QSM, version 5.1, and as requested on the COC.

Quality Control

The sample was prepared and analyzed within the holding time required by the method.

The method blank was non-detect for all target pesticides.

The LCS/LCSD met accuracy criteria for all target pesticides. However, all LCS/LCSD RPDs exceeded criteria, as follows:

Batch ID	Analyte	RPD	Criteria
191960006A	Gamma BHC – Lindane	38	RPD ≤ 30
	Endrin	37	
	Heptachlor	39	
	Heptachlor Epoxide	39	
	Methoxychlor	35	

The IDW sample was non-detect for all target TCLP pesticides. Therefore, data quality was not affected, and no data qualifiers were applied. It appears the high RPDs were due to a laboratory spiking error as all LCS recoveries were near 70% and all LCSD recoveries were above 100%.

All surrogate spike recoveries met criteria.

No additional data quality issues were found for the TCLP pesticide analyses in this data set and no data was qualified as a result of the review.

HERBICIDES

General

The herbicide portion of this SDG consisted of one IDW soil sample. The sample was collected on July 8, 2019 and was analyzed for the herbicides 2,4-D and 2,4,5-TP (Silvex) as required by the waste disposal company. It should be noted that the herbicide analysis was performed by APPL due to a shortage of diazol that prevented ELLE from being able to properly analyze the sample for this parameter.

The sample was analyzed in accordance with U.S. EPA SW-846 Method 8151A and the DoD QSM, version 5.1, and as requested on the COC.

Quality Control

The sample was prepared and analyzed within the holding time required by the method.

The method blank was non-detect for all target herbicides.

The LCS/LCSD met accuracy and precision criteria for all target herbicides.

All surrogate spike recoveries met criteria.

No data quality issues were found for the TCLP pesticide analyses in this data set and no data was qualified as a result of the review.

REACTIVITY - CYANIDE

General

The reactive cyanide portion of this SDG consisted of one IDW soil sample. The sample was collected on July 8, 2019 and was analyzed for reactive cyanide as required by the waste disposal company.

The sample was extracted and analyzed in accordance with the interim method described in U.S. EPA SW-846 Revision 3, December 1996 – Chapter 7.3. It should be noted that on July 14, 2005, the EPA published a rule in the Federal Register that removed the Interim Guidance and the methodology referenced above. Currently there is no specific guidance or method for the analysis of reactivity. However, as the waste disposal company required analysis of reactive cyanide, the methodology noted was used, even though it is no longer valid.

The sample was analyzed as requested on the COC.

Quality Control

The sample was prepared and analyzed within the holding time required by the method.

The method blank was non-detect for reactive cyanide.

The LCS met accuracy criteria for reactive cyanide.

No data quality issues were found for the reactive cyanide analyses in this data set and no data was qualified as a result of the review.

REACTIVITY - SULFIDE

General

The reactive sulfide portion of this SDG consisted of one IDW soil sample. The sample was collected on July 8, 2019 and was analyzed for reactive sulfide as required by the waste disposal company.

The sample was extracted and analyzed in accordance with the interim method described in U.S. EPA SW-846 Revision 3, December 1996 – Chapter 7.3. It should be noted that on July 14, 2005, the EPA published a rule in the Federal Register that removed the Interim Guidance and the methodology referenced above. Currently there is no specific guidance or method for the analysis of reactivity. However, as the waste disposal company required analysis of reactive sulfide, the methodology noted was used, even though it is no longer valid.

The sample was analyzed as requested on the COC.

Quality Control

The sample was prepared and analyzed within the holding time required by the method.

The method blank was non-detect for reactive sulfide.

The LCS met accuracy criteria for reactive sulfide.

No data quality issues were found for the reactive sulfide analyses in this data set and no data was qualified as a result of the review.

IGNITABILITY

General

The ignitability portion of this SDG consisted of one IDW soil sample. The sample was collected on July 8, 2019 and was analyzed for ignitability as required by the waste disposal company.

The sample was analyzed in accordance with U.S. EPA Title 40, Code of Federal Regulations (40 CFR), Part 261.21. The sample was analyzed as requested on the COC.

Quality Control

No holding time is designated for ignitability.

No quality control samples are required for the analysis of ignitability.

No data quality issues were found for the ignitability analyses in this data set and no data was qualified as a result of the review.

COMPARABILITY

All data was generated using contract-specific standard methods and reported with known data quality, type of analysis, units, etc.

SENSITIVITY

The LOD and LOQ values reported for the samples were sufficient to meet waste disposal requirements. Sample LODs and LOQs were adjusted based on dilution and/or initial/final volumes.

DATA USABILITY

The purpose of this data validation report is to ensure the integrity and reliability of analytical laboratory data. The data quality is evaluated based on precision, accuracy, representativeness, comparability, and completeness (PARCC) characteristics of the data. No data was rejected for this data set. Minor QC exceedances where data was qualified as estimated and flagged “J” are considered usable for the purposes of this project.

DATA QUALIFIER CHANGES

The following data qualifiers were added, removed, or changed as a result of the data validation process:

Sample ID	Analyte	Units	Original Result	Final Result	Reason Code
BRLTN-IDW-S01	Vinyl chloride	µg/L	10 U	10 UJ	M3, M4
BRLTN-IDW-S01	Silver	mg/L	0.0075 U	0.0075 UJ	M3

DATA QUALIFIER DEFINITIONS

The data qualifiers are defined in Table 36.2 of the project-specific UFP-QAPP, as follows:

R	The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified. The data is unusable.
J	The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
UJ	The analyte was not detected. However, the reported LOD is approximate and may or may not accurately and precisely represent the concentration necessary to detect the analyte in the sample.
U	Analyte was not detected and is reported as less than the LOD. The LOD has been adjusted for any dilution or concentration of the sample.

REASON CODE DEFINITIONS

Reason codes were used to document the logic behind all data validation qualifiers. The following reason codes for data qualification were associated with the samples in this SDG:

M3: MS/MSD percent recovery infraction with low bias

M4: MS/MSD or Duplicate precision infraction