

P-0534
September 10, 2020

Ms. Rebecca Buswell
Massachusetts Department of Environmental Protection
8 New Bond Street
Worcester, MA 01606

**Re: IRA Status Report No. 2
6 Town Hall Drive
Princeton, Massachusetts
RTN 2-21072**

Dear Ms. Buswell:

On behalf of the Town of Princeton (the "Town"), Tighe & Bond has prepared this Immediate Response Action (IRA) Status Report No. 2 for the response actions that commenced after the Massachusetts Department of Environmental Protection ("MassDEP") sent a Notice of Responsibility ("NOR") to the Town dated November 25, 2019, in response to the reported detection of per-fluoroalkyl substances (collectively known as "PFAS") in the drinking water well that serves the Princeton Town Hall campus at 6 Town Hall Drive in Princeton ("the Site"). The Site previously was identified as a disposal site for a release of fuel oil from underground storage tanks (UST) removed in 1987 that has been the subject of response actions conducted under Release Tracking Number (RTN) 2-11327.

In May 2019, the Town and MassDEP entered into Administrative Consent Order ACO-CE-19-5D00006872 ("ACO") to address the Town's obligations for the Public Water Supply ("PWS") being operated at the Site. In accordance with Section 8(C)(vii) of the ACO, drinking water samples from the PWS well were collected by the Town's PWS operator on September 5, 2019 and September 27, 2019. These sample results identified total regulated PFAS concentrations of 127 and 102 parts per trillion ("ppt," or nanograms/liter ("ng/L"), respectively. At that time, MassDEP's drinking water guideline was 70 ppt, and MassDEP's proposed Maximum Contaminant Level ("MCL") for PFAS in public water supply wells is proposed to be a combined total of 20 ppt for six specified PFAS compounds.

The PWS sampling results were reported by the Town's PWS operator to the MassDEP's Division of Water Supply, which reportedly informed MassDEP's Bureau of Waste Site Cleanup ("BWSC") staff of the results. Subsequently, MassDEP's BWSC staff contacted Jeffrey Arps of Tighe & Bond, as the LSP of record for RTN 2-11327, to suggest that action should be taken to address the results under the Massachusetts Contingency Plan ("MCP"). On November 4, 2019, on behalf of the Town of Princeton, Tighe & Bond verbally notified MassDEP of these drinking water sample results as a 2-hour reporting condition, although the MCP at 310 CMR 40.0317(11) states that releases of oil and/or hazardous material in groundwater detected by sampling conducted by PWS owners or operators under 310 CMR 22.00: Drinking Water, as indicated by the presence of oil and/or hazardous material in a PWS source, are **exempt** from the notification requirements in the MCP.

On November 4, 2019, MassDEP assigned RTN 2-21072 to the notification and modified the release to a 72-hour Substantial Release Migration ("SRM") condition under 310 CMR 40.0313(4)(d). Under the MCP, the requirement to provide notification for an SRM condition is triggered when a release to groundwater is detected in a PWS well, where that condition is associated with a release for which notification otherwise is or has at any time in the past been required under the MCP. Although the presence of PFAS in the PWS well at the Site was not identified as a condition associated with a release for which notification is or has at any



time in the past been required under the MCP, the NOR sent to the Town by MassDEP states: "The detection of PFAS in the public drinking water supply well from a release at the Site constitutes a condition of SRM."

Under 310 CMR 40.0414(3), IRAs are presumed to require elimination and/or mitigation of a Critical Exposure Pathway ("CEP"), which in this instance would include routes by which PFAS may be transported to human receptors by ingestion of "measurable concentrations" of PFAS from drinking water supply wells located at and servicing a pre-school, daycare, school or occupied residential dwelling. Given the proximity of residences served by private wells in the vicinity of the Site, the IRA plan included steps to investigate the presence of PFAS in private wells and, if measurable concentrations were detected, to mitigate the potential for ingestion of PFAS.

The activities described herein include immediate response actions completed since the submittal of the IRA Status Report No.1 and IRA Plan Modification on February 3, 2020. The modifications to the Plan were verbally approved by MassDEP on February 14, 2020.

A Site Plan (Figure 1) showing private well locations and their respective PFAS6 results is included in Appendix A, for reference.

Release History

As stated, MassDEP BWSC was notified on November 4, 2019, of the sample results from the PWS well samples collected on September 5, and 27, 2019. Subsequent to notification, MassDEP issued the NOR and assigned RTN 2-21072 to the detection of PFAS and the following immediate response actions proposed by Tighe & Bond were approved:

- Provide bottled water or water treatment for every location serviced by this public water supply well; Install signs on all water dispensing locations at the Town Hall campus including all buildings served by PWS 2241017-01G, warning people not to drink the tap water due to PFAS contamination;
- Sample and analyze monitoring wells, private drinking water supply wells, and public water supply wells within 500 feet for PFAS; and
- Resample the Town Hall campus public water supply (PWS) 2241017-01G on a quarterly basis for PFAS.

On November 19, 2019, the Town of Princeton sent letters to all residents within a 500-foot radius of the Town Hall PWS, informing residents of the detection and requesting access to their homes to collect a water sample from their potable well for PFAS analysis. Letters were sent to the following addresses:

- 5, 7, 15, 19 and 23 Hubbardston Road;
- 6, 10, 14, 18, 19, 20, 21 and 22 Mountain Road; and
- 5 and 7 Prospect Street

A copy of the letter sent to these locations was included in the January 3, 2020 IRA Plan.

Between December 4 and December 16, 2019, samples were collected from eleven of the 15 locations included in the initial round of private potable well sampling.

On December 13, 2019, laboratory results were received for the samples collected at 5, 7, 15, 19 Hubbardston Road, and 6, 19, and 21 Mountain Road. Total concentrations for the regulated PFAS compounds were 39.2, 9.7, 132.6, 9.7, 30.1, 421.0, and 102.4 ng/L,

respectively. Based on these results and discussions with MassDEP, residents were verbally notified of the results within 24-hours of receipt of the data and the Town mobilized to immediately provide bottled water to all sample locations with detections. The laboratory data are summarized in Table 1, in Appendix B. The laboratory reports for these 7 locations were included in the IRA Plan submitted on January 3, 2020.

On December 17, 2019 a granular activated carbon (GAC) filter system consisting of two 2-cubic foot GAC vessels was installed at 19 Mountain Road. This system was installed as a temporary measure to reduce PFAS concentrations. This system was upgraded on January 10, 2020 to two 6-cubic foot GAC vessels to increase GAC longevity due to the elevated PFAS concentrations at this location.

Radius 2 Sampling

Based on the sample results from the 14 potable wells within 500 feet of the Town Campus PWS, the sampling radius was extended by 500 feet from any location with a confirmed PFAS detection. The locations included in the new radius (Radius 2) include the following properties:

- 7, 12, 13, 16, 17, 18, 24 Boylston Avenue;
- 11, 13, 14, 15 Gregory Hill Road;
- 2, 29, 30, 33 Mountain Road;
- 1 Hubbardston Road;
- 11, 16, 17, 18 Prospect Street; and
- 1, 10 Worcester Road

On December 20, 2019, the Town of Princeton sent letters to all residents within Radius 2, informing residents of the detection and requesting access to their homes to collect a water sample from their potable well for PFAS analysis. The 22 properties included in Radius 2 are shown on the Site Plan (Figure 1) included in Appendix A for reference. As of this submittal, all Radius 2 potable wells have been sampled.

Based on the laboratory results for the Radius 2 sample locations; the potable wells located at 7 and 12 Boylston Avenue, 15 Gregory Hill Road, 1 Hubbardston Road and 29 Mountain Road contained regulated PFAS concentrations above the proposed MCL. POET systems have been installed at those locations. The laboratory data for the Radius 2 private wells are summarized in Table 1, in Appendix B. The laboratory reports for the Radius 2 sample radius were included in the IRA Status Report submitted March 3, 2020.

43 Hubbardston Road

43 Hubbardston Road was located outside the initial 500-foot radius from the Town Campus PWS. However, the homeowner collected a water sample, on their own behalf, from their potable well on December 12, 2019 and submitted the sample for PFAS analysis to Con-Test Laboratory in East Longmeadow, Massachusetts, which is the same laboratory used by the Town. The results were shared with the Town and Tighe & Bond in January 2020. PFAS concentrations for the six regulated compounds were reported at 29 ppt. Based on this result, all potable wells within 500-feet of 43 Hubbardston Road were included in the new sampling radius (Radius 3) that was created based on the sampling results within Radius 2. A POET system was installed at 43 Hubbardston Road on March 20, 2020.

Radius 3 Sampling

Based on the sample results from the 22 potable wells within Radius 2, as well as 43 Hubbardston Road, a new sampling radius was extended 500 feet from any location with a confirmed PFAS detection. The locations included in Radius 3 include the following properties and are shown on the Site Radius Map (Figure 1) included in Appendix A.

- 9, 12 Allen Hill Road
- 21 Boylston Road
- 21, 44 Gregory Hill Road
- 33, 35, 36, 39, 42, 44, 46, 48, 52 Hubbardston Road
- 38, 51 Mountain Road
- 26, 27, 31 Prospect Street
- 2, 7, 8, 11, 12, 13 Radford Road
- 15, 16, 17, 20, 23 Worcester Road

On January 23, 2020, the Town of Princeton sent letters to all residents within Radius 3, informing residents of the detection and requesting access to their homes to collect a water sample from their potable well for PFAS analysis.

On January 28, 2020, a public information meeting was held at the Thomas Prince School in Princeton. Based on the outcome of that meeting, several residents located outside the three established radii requested testing of their potable wells and indicated that they would pay for their own analysis if Tighe & Bond collected the samples. The Town agreed to allow the collection of potable well samples from 28 Radford Road, 9 Gregory Road, 64 Mountain Road, and 32 Allen Hill Road. For these locations, PFAS was not reported in the potable well samples collected at 9 Gregory Road and 32 Allen Hill Road. Total regulated PFAS concentrations of 15.1 ppt and 75 ppt were reported in the potable well samples collected from 28 Radford Road and 64 Mountain Road, respectively.

Due to the elevated PFAS concentration detected at 64 Mountain Road, all potable well locations within 500 feet of 64 Mountain Road were added to Radius 3, which include:

- 85, 105 Merriam Road
- 54, 58 Mountain Road

In addition, a POET system was installed at 64 Mountain Road on February 18, 2020.

IRA Plan Modification

On February 14, 2020, Tighe & Bond requested modifications to the IRA Plan submitted on January 3, 2020, during a telephone conversation with Rebecca Buswell and Joe Laughton of MassDEP. At that time the following modifications were requested.

1. A reduction in the sampling of POET systems during the first month of operation from days 3, 6, and 1 month to once per month, as long as bottled water continues to be supplied until it is proven through laboratory analysis that the system is operating effectively;
2. Discontinuation of bottled water at houses where POET systems have been proven effective;

3. A reduction in how often field blank samples are analyzed. Going forward, field blanks will only be analyzed if there is a detection in the batch which the field blank accompanies, or in the case of POET sampling only if the effluent sample has a detection.

These IRA Plan modifications were orally approved on February 14, 2020 and were memorialized in IRA Status Report No. 1, which was submitted to MassDEP on March 3, 2020.

Status of Immediate Response Actions

Potable Well Sampling

With the submittal of this Status Report, all potable wells within the Radius 3 sampling area have been sampled with the exception of 35 and 39 Hubbardston Road, and 27 and 31 Prospect Street. There has been no contact with the owners of 35 Hubbardston Road and 27 Prospect Street. The property at 35 Hubbardston Road does appear to be occupied but the property at 27 Prospect Road appears vacant. Notification letters were sent to the owners and multiple attempts were made to contact the residents by leaving flyers on the door; however, no response has been received to date. The properties at 39 Hubbardston Road and 31 Prospect Street are vacant. The property at 39 Hubbardston Road is listed as being in foreclosure and is bank-owned. The property is currently vacant, and no attempts have been made to contact the bank that owns the property at this time. Field staff will monitor the property for activity and contact the new owner upon transfer of the property. The property at 31 Prospect Street is condemned and is not accessible.

Based on the laboratory results for the Radius 3 sample locations, the potable wells located at 51, 54, and 58 Mountain Road as well as 12 Radford Road contained regulated PFAS concentrations above the proposed MCL. POET systems have been installed at those locations. The laboratory data for the Radius 3 private wells are summarized in Table 1, in Appendix B. The laboratory reports for potable wells located within Radius 3 are included in individual notification letters in Appendix C.

Radius 4 Sampling

Based on the sample results from the 34 potable wells within Radius 3 the sampling radius was further extended by 500 feet from any location with a confirmed PFAS detection. The locations included in Radius 4 include the following properties and are shown on the Site Radius Map (Figure 1) included in Appendix A.

- 15, 19, 20 Allen Hill Road
- 40 Boylston Ave
- 4 Goodnow Road
- 73, 81 Hubbardston Road
- 57, 59, 70 Merriam Road
- 41 Prospect Street
- 15, 18, 23, 29, 33, 37, 38 Radford Road

On March 25, 2020, the Town of Princeton sent letters to all residents within Radius 4, informing residents of the detection and requesting access to their homes to collect a water sample from their potable well for PFAS analysis. Due to the Covid-19 pandemic, sampling of these homes was not initiated until late April 2020. To date the potable wells in Radius 4

have been sampled with the exception of 15, 18 and 38 Radford Road. These three locations have not been responsive to inquiries to access their potable wells.

Laboratory results for the Radius 4 sample locations indicate that PFAS concentrations for the six regulated compounds were below the proposed MCL at all 15 of the locations sampled. PFAS6 was reported at concentrations below the proposed MCL at six locations (20 Allen Hill, 40 Boylston, 57 Merriam, 23, 29, and 37 Radford). Due to the detections at these locations bottled water is being provided by the Town. The laboratory data for the Radius 4 private wells are summarized in Table 1, in Appendix B. The laboratory reports for potable wells located within Radius 4 are included with the individual notification letters in Appendix C.

Radius 4A Sampling

Based on the sample results from the potable wells within Radius 4, the sampling radii remained relatively unchanged from the previous radii; however, based on the PFAS detections at 37 Radford Road, 40 Boylston Avenue and 57 Merriam Road, Radius 4 s extended an additional 500 feet from those locations. The only private wells located within the expanded radius (Radius 4A) include 6 Connor Lane, and 55 and 58 Merriam Road. These three locations are being included in the Radius 4A sampling.

On July 29, 2020, the Town sent letters to the locations within Radius 4A, informing residents of the detections and request access to their homes to collect a water sample from their potable well for PFAS analysis. The sample for 6 Connor Lane was collected on August 31, 2020, the results of which are pending. At this time, no response has been received from the owners of 55 or 58 Merriam Road.

Quarterly Sampling

Quarterly sampling for those locations originally sampled in December 2019, and January and February 2020, was conducted in late May through July 2020. The locations included in the quarterly round include the following properties and are shown on the Site Radius Map (Figure 1) included in Appendix A.

- 9, 12, 32 Allen Hill Road
- 13, 16, 17, 21, 24 Boylston Avenue
- 11, 13, 14, 21, 44 Gregory Hill Road
- 7, 19, 23, 33, 36, 42, 44, 46, 48, 52 Hubbardston Road
- 85, 105 Merriam Road
- 2, 10, 14, 22, 30, 33, 38 Mountain Road
- 7, 11, 16, 17, 18, 21, 26 Prospect Street
- 2, 7, 8, 11, 13, 28, 29 Radford Road
- 1, 10, 15, 16, 17, 20, 23 Worcester Road

As of this submittal, quarterly sampling is complete with the following exceptions; 11 Prospect Street, 21 Gregory Hill Road, 52 Hubbardston Street, and 2 Radford Road. The properties at 2 Radford Road and 11 Prospect Street were recently sold and have new owners. The Town sent letters to both owners on July 29, 2020. To date a response has not been received from the owner of 2 Radford Road. The owner of 11 Prospect Street did respond and provided an email address only for contact information. Despite our attempts to reach the owner by email, a response has not been received. The owners of 21 Gregory Hill Road and 52 Hubbardston have not been responsive to inquiries to access their potable wells. The Town and Tighe &

Bond will continue to attempt to make contact with these unresponsive owners to facilitate well sampling.

Laboratory results for the quarterly sampling at Radius 4 sample locations indicate that PFAS concentrations for the six regulated compounds were detected below the proposed MCL at 36, 42, and 44 Hubbardston, and 1 Worcester Road. Samples collected at these locations previously were non-detect for the 6 regulated compounds, so due to the new detections at these locations bottled water is being provided by the Town. The laboratory data for the quarterly sampling are summarized in Table 1, in Appendix B. The laboratory reports for potable wells sampled as part of the quarterly sampling effort are included in the individual notification letters in Appendix C.

Point-of-Entry Treatment System Status

Point-of-entry treatment (POET) systems are required for all locations with PFAS6 concentrations exceeding 20 ppt. Twenty-two (22) locations have been identified as requiring treatment. To date POET systems have been installed at 21 of these locations. Permitting for a treatment system at 14 Mountain Road is ongoing due to its status as a public water supply.

With the exception of 18, 19, 22, 54, and 58 Mountain Road, the POET systems consist of two 2-cubic foot carbon vessels in series, a 1-micron sediment filter ahead of the GAC vessels, and a flow meter. The flow meter readings and the influent data will be used to evaluate the lifespan of the carbon vessels once breakthrough of the primary vessel occurs. To date, midfluent and effluent samples collected from the POET systems at all locations have been non-detect.

The POET systems installed at 18, 19 and 22 Mountain Road were upsized to two 6-cubic foot carbon vessels due to the elevated PFAS concentrations detected at those locations. The POET systems at 54 and 58 Mountain Road consist of four 2-cubic foot carbon vessels due to elevated PFAS concentrations, high water consumption and space limitations.

Initial monitoring of POET systems consisted of collecting influent, midfluent, and effluent samples (approximately) on days 1, 3, 6, and then weekly for the first month of operation. However, based on observed system performance, MassDEP approved modifying the monitoring protocol to one round of sampling in the first month. Bottled water is provided until laboratory data demonstrating the system's efficacy (non-detect in the mid and effluent samples) are received.

If PFAS are detected in the mid-point sample at a concentration approaching or exceeding 20 ppt, the primary carbon unit will be considered spent. The secondary GAC unit will be moved to the primary position and the primary canister will be removed for carbon replacement. A unit with fresh GAC will be installed as the new secondary unit and the spent carbon will be disposed.

29 Mountain Road Effluent

POET system monitoring samples collected at 29 Mountain Road on May 8, 2020 detected a PFAS6 concentration of 25.2 ppt in the effluent sample. The midfluent sample collected on the same date was non-detect for PFAS. It appears that the effluent sample was collected from the influent sample port. The system effluent was resampled on June 3, 2020. PFAS was not detected in the effluent sample collected on June 3, 2020.

On June 30, 2020 the system was sampled again as part of regular monthly monitoring and again PFAS was detected in the effluent sample. An inspection of the system was conducted on July 14, 2020 and it was determined that a shut off valve used to bypass the system had been left open, causing untreated water to enter the effluent sample port. At that time, the bypass valve was closed, the system was flushed, and the effluent was resampled. PFAS was not detected in the effluent sample collected on July 14, 2020.

POET Sampling Frequency

On August 13, 2020, Tighe & Bond submitted an IRA Plan Modification to request approval to reduce the point-of-entry treatment (POET) system monitoring frequency. As presented in the modification request, and according to a MassDEP email received on July 28, 2020, such a monitoring reduction may be requested for locations where “stable conditions” have been demonstrated. Stable conditions are indicated where data from a minimum of three consecutive monthly samples show that the system effluent is non-detect for PFAS.

POET system monitoring to date has not detected breakthrough of the primary carbon vessel at any of the 21 locations. where POETs have been installed. Of the 21 locations with POETs, at least three monthly rounds of monitoring results show no PFAS detections in the midfluent or effluent samples at the following 16 locations:

- 7 and 12 Boylston Street
- 15 Gregory Hill Road
- 1, 5, 15 and 43 Hubbardston Road
- 6, 18, 19, 20, 21, 22, 29, 51 and 64 Mountain Road
- 5 Prospect Street

The POET monitoring reduction request was approved by MassDEP on September 1, 2020. The four remaining locations, 22, 54 and 58 Mountain Road and 12 Radford Road, will continue to be sampled monthly until stable conditions are demonstrated.

14 Mountain Road

The property at 14 Mountain Road is currently registered as a public water supply, which requires a permit for POET installation. Tighe & Bond has designed the system and is applying for this permit on behalf of the Town of Princeton. The design has been forwarded to the PWS operator for review and submittal to MassDEP for final approval. The Town will continue to provide bottled water to the church at 14 Mountain Road and signage is maintained at all fixtures indicating that tap water is “not for potable use.”

Imminent Hazard Evaluation

The MCP requires the performance of an Imminent Hazard Evaluation (IHE) as part of any MCP response action. The MCP defines six conditions at 310 CMR 40.0321(1) that pose or could pose an IH. These relate to (1) explosive vapors in buildings, (2) a release of reactive or explosive materials, (3) roadway releases that could endanger public safety, (4) a release to the environment that poses a Significant Risk to human health, if present for even a short time, (5) a release to the environment that produces immediate or acute effects to fish, or (6) a release to the environment that produces readily apparent effects to human health.

Seven additional specific circumstances that could constitute an Imminent Hazard are listed at 310 CMR 40.0321(2)(b). These relate to arsenic, cadmium, chromium, cyanide, mercury, methyl mercury and PCBs, none of which are contaminants of concern for this site.

Potable Well Exposures

MassDEP has indicated that drinking water well PFAS6 concentrations in excess 100 ppt are considered an Imminent Hazard. Based on this criterion, Imminent Hazard conditions would exist at the following eight locations (these locations are indicated by a purple border on Figure 2):

- Town Hall (6 Town Hall Drive)
- 15 Hubbardston Road
- 18, 19, 21, 22, 29 and 58 Mountain Road

In addition to the specific criteria cited above, 310 CMR 40.0321(2)(c) includes:

“a release to the environment for which estimated long-term risk levels associated with current exposures are greater than ten times the Cumulative Receptor Risk Limits in 310 CMR 40.0993(10). Past exposures may be included in such evaluations to the extent that it is reasonable to quantify those exposures.”

PFAS have not been added to the Method 3 Shortforms, so the risk calculations must be performed manually to evaluate this risk. Sovereign Environmental was contracted to perform these Imminent Hazard Evaluation risk calculations. Based on the risk calculations, Sovereign confirmed that under the criteria at 310 CMR 40.0321(2)(c), the PFAS6 concentrations exceeding 100 ppt constitute an Imminent Hazard.

Bottled water was immediately provided and point of entry treatment (POET) systems were subsequently installed at each of the above locations, which mitigate the IH condition, except for the Town Hall, where a POET design and permit are required due to its designation as a Public Water Supply. The sinks and bubblers in the buildings served by the Town Hall well have been marked with signage indicating the water is not suitable for drinking, and bottled water is being provided.

Stormwater Runoff at 30 Mountain Road

A stormwater runoff sample was collected from a drain pipe that appears to drain runoff from the property at 30 Mountain Road. Analytical results for this sample indicated very elevated PFAS concentrations (3,642 ppt for PFAS6, 3,795 ppt for total PFAS). The 13 specific IH conditions identified above do not apply to this discharge, leaving the same long-term risk evaluation as a potential IH condition. The Method 1 GW-3 standards established for PFAS6 are 500 µg/L (500,000 ppt for PFOS and PFHxS) and 40,000 µg/L (40,000,000 ppt) for the remaining four compounds.

The specific water body that might receive this runoff is not known, but MassDEP used surface water target values of 1,705 µg/L for PFOA and 19 µg/L for PFOS (from Minnesota Pollution Control Agency, 2007, cited in MassDEP *Summary of Proposed MCP Method 1 Standards Revisions*, March 2019) as the basis for establishing the Method 1 GW-3 standards. The PFOA (100 ppt) and PFOS (2,800 ppt) concentrations detected in the “runoff” sample are significantly below these target values of 1,705,000 ppt for PFOA and 19,000 ppt for PFOS, indicating that such a discharge would not pose a Significant Risk, much less an Imminent Hazard. Therefore, the “runoff” does not pose an Imminent Hazard.

Sovereign’s IHE also discusses the runoff sample. Sovereign’s IHE documentation is provided in Appendix D.

Town Hall Campus Well Quarterly Sampling

White Water is the licensed operator for the Town Hall well. The PFAS treatment system for this well is currently being designed. All of the sinks in the four municipal buildings on the Town Hall campus have been labeled as “not for potable use” and bottled water is available in all of the buildings served by the well. The status of this treatment system will be updated in subsequent status reports.

White Water collected a sample from the Town Hall campus well on June 23, 2020. The sample, identified as 01, was submitted to Alpha Analytical in Westborough, Massachusetts for PFAS analysis by EPA Method 537.1. Based on the results, a PFAS6 concentration of 110.3 ppt was reported. Whitewater will continue to sample the Town Hall Campus well quarterly and provide the data to Tighe & Bond. The Town Hall campus, historical and current, sampling results are included in Table 1 in Appendix B. A copy of the June 23, 2020 laboratory report is included in Appendix E.

Groundwater Monitoring Well Sampling

During the 1990s and early 2000s, numerous groundwater monitoring wells were installed at the Town Hall campus at 6 Town Hall Drive associated with the release of petroleum under RTN 2-11327. Remaining viable monitoring wells include MW-6, MW-10A, MW-10D, MW-14 and MW-18R. MW-7DRR, which was installed along Hubbardston Road downhill from monitoring well MW-18R, was found to have been paved over and was not available for sampling, and MW-12, which was located behind the Town Hall Annex building, could not be located in the field.

These monitoring wells were installed to assess a petroleum release, so they are much more shallow (these wells range in depth from approximately 8 to 10 feet deep, with MW-18R being approximately 30 feet deep) than the deep bedrock wells used by the Town Hall water supply and the private wells at residences in the sampling radii, which are hundreds of feet deep.

On January 2, 2020 four of the six wells (MW-10A, MW-10D, MW-14, and MW-18R) were sampled for PFAS analysis. Those results were included in IRA Status Report No. 1.

During the January 2020 sampling event, MW-6 had a blockage that prevented sample collection. On June 23, 2020, Tighe & Bond was able to remove the obstruction from MW-6, which was found to be part of broken riser pipe and collect a groundwater sample.

The groundwater analytical results for the sample collected from MW-6 on June 23, 2020 indicated a PFAS concentration of 28.1 ppt. Laboratory results for the groundwater samples collected on January 2, 2020 and June 23, 2020 are summarized in Table 1, included in Appendix B. The laboratory report for the MW-6 sample collected on June 23, 2020 is included in Appendix E. The January 2020 groundwater laboratory reports were included in IRA Status Report No. 1.

Remediation Waste

No remediation waste has been generated to date under RTN 2-21072.

Permits

The only permits involved with this project involve the permit needed to install a POET on the public water systems at the Town Hall and the church at 14 Mountain Road. No other permits are required for the IRA activities completed to date or the proposed IRA activities planned under the modifications for RTN 2-21072.

Notification of Environmental Sampling Results

In accordance with the MCP at 310 CMR 40.1403(10) a Notice of Environmental Sampling is required any time environmental samples are taken at a property in the course of investigating a release for which a notification to the Department has been made on behalf of someone other than the owner of the property, within 30 days of the date the sample results are issued by the laboratory. Table C-1 in Appendix C provides a summary of the dates that laboratory reports were received, the dates when public notifications are due, and the dates when the notification letters were sent. Copies of the public notification letters sent since the submittal of IRA Status Report No. 1 are included in Appendix C. The BWSC-123 Forms and laboratory reports for the potable well sampling are included with the individual letters.

Verbal notifications were made within 24 hours to those residents with detections (along with the notifications to MassDEP, and the Princeton Board of Health).

Conceptual Site Model

NewFields Data Review

The specific source(s) of the PFAS detections summarized above are not definitely known. The data suggest that firefighting at the former Princeton Inn (30 Mountain Road), site of a large fire in May 2017 that was reportedly fought with Class B AFFF, has likely contributed to the groundwater contamination. There is a Fire Station within the Town Hall campus, which has been active for several decades. It has been reported that several decades ago, up to 10 gallons of AFFF may have been used during fire training at the Town Hall Campus property. The Town's investigation of this report is ongoing.

The sampling data were submitted to NewFields, an environmental consulting firm that specializes in contaminant source attribution and environmental forensics. NewFields is evaluating concentration gradients of PFAS, patterns of measured PFAS and the detection of certain specific PFAS compounds, to assess whether the PFAS detected throughout the area might have originated from a single source or event, or if there is evidence it originated from multiple sources or events.

Overall Site CSM

While all potential sources of PFAS contamination in the area have not been identified, sources of contamination have been confirmed in the vicinity of upper and lower Mountain Road. These sources appear to have been related to the use of PFAS-containing AFFF, likely resulting in surface contamination. This surface contamination was transported to groundwater through percolation vertically through the overburden soils with precipitation (and firefighting water), impacting groundwater in both overburden and bedrock aquifers.

Groundwater contamination extends from these apparent source areas in all directions, but has migrated primarily to the south-southwest, as evidenced by PFAS contamination extending in that direction. The apparent boundary of the disposal site is defined to the north (105 Mountain Road, 70 Merriam Road), south (20, 23 Worcester Road), west (Allen Hill Road, 4 Goodnow Rd, 73 and 81 Hubbardston Road) and east of the source areas (18, 26 Prospect Street, 21, 44 Gregory Hill Road), as indicated by non-detect results at these properties.

Quarterly sampling of potable wells to the southwest suggest the extent of contamination in this direction is located in the vicinity of lower Radford Road and its intersection with Connor Lane and Brooks Station Road.

Three homes along Hubbardston Road, 36, 42 and 44, were non-detect for PFAS in February 2020 but had detections of PFAS6 ranging from 10 to 15 ppt in July 2020, suggesting plume migration in this area, but also recognizing that PFAS were detected at 43 Hubbardston Road, which appears to be downgradient of 36/42/44 Hubbardston Road, in December 2019. These detections suggest a vertical difference in contaminant concentrations rather than simply horizontal migration and highlights the data variability between residential wells due to the varying depths of these wells, tapping into different bedrock fractures with apparently different degrees of contamination. With the proximity of the two apparent source areas to each other, it is likely that some degree of mixing is occurring as the contamination migrates.

The “runoff” sample from the outfall pipe below 30 Mountain Road was highly contaminated. The specific source area for the water that enters that drainage system is not known, as the 30 Mountain Road property has not been evaluated beyond collecting samples from the potable well serving the occupied second structure on the property. Further, the fate of the water once discharged is also not known, beyond that it flows on the surface down Mountain Road toward the intersection with Gregory Hill/Boylston/Worcester Roads. The flow pattern beyond this general area and the ultimate fate of this discharged water is not known. Shortly after the sample results were received from the laboratory, the drain pipe was reportedly plugged by the owner to prevent additional discharge from the pipe.

Conclusions

As discussed above, a substantial sampling effort has been performed to identify the extent of PFAS contamination in private wells based upon the directive from MassDEP to evaluate a condition of SRM in the area surrounding the Town Hall Campus. To date, 91 homes have been either sampled or are proposed for sampling based on currently available data.

In addition, POETs have been installed at 21 locations. The only remaining POET that has not been installed is at 14 Mountain Road, which is a public water supply. As reported in this submittal, permitting and design for the treatment system at this location is ongoing. In the interim, White Water is sampling the Town well quarterly. We will notify MassDEP when a schedule has been determined for these installations.

An Imminent Hazard evaluation completed by Sovereign Consulting, Inc. indicates that the raw water PFAS6 concentrations do pose an IH condition, but that condition has been mitigated through the installation of POET systems, resulting in no ongoing exposure to the residents at these homes.

Source identification is ongoing, to evaluate whether historical use of AFFF at the Town Campus and/or use of AFFF during firefighting in 2017 at 30 Mountain Road might be the sources of the PFAS being detected in private wells. It also is being evaluated whether any residual source areas of PFAS at either location may be present that can be managed or controlled to eliminate potential continued migration of PFAS from shallow soil into the deep bedrock fractures in the area where private water supplies are being derived.

Recommendations

The potable well sampling to date has generally defined the extent of groundwater contamination, although it is anticipated that additional properties to the southwest may be impacted by low PFAS6 concentrations. We are attempting to gain access to 38 Radford Road, as well as 55 and 58 Merriam Road for sampling. The well at 6 Connor Lane was sampled on August 31, 2020, the results for which, are pending). Additional POET systems will be installed if PFAS6 concentrations exceed 20 ppt at any locations.

With the approval of the POET monitoring reduction to a quarterly basis (once three monthly rounds show effective treatment), private well sampling will proceed on a monthly basis until three monthly sampling results show the system is working properly, and will move to a quarterly schedule once three monthly results have been received.

In addition to ongoing private well sampling, efforts are underway to execute an access agreement to allow soil sampling at 22 and 30 Mountain Road to evaluate soils at and downhill from the 30 Mountain Road fire site.

Monitoring well MW-7DRR, which was located along Hubbardston Road downhill from the fire station, will be replaced (the well was apparently paved over). Additional monitoring wells will also be installed as part of this drilling work, which will be sampled for PFAS following installation (locations are currently being identified). The groundwater samples, as well as key private wells, will be analyzed for an expanded PFAS list (34 compounds) through the isotope dilution method to further refine the forensic understanding of the contaminant sources. Results of these sampling and analysis efforts will be provided in the next IRA Status Report, and potable well sampling results will continue to be provided in monthly status update reports.

An update on these activities will be reported to MassDEP in the next IRA Status report and a spreadsheet of current results will be uploaded to MassDEP monthly. If you have any questions or require additional information, please contact me at 413.572.3227.

Very truly yours,

TIGHE & BOND, INC.



Jeffrey L. Arps, LSP
Director, Remediation & Field Services

cc: Sherry Patch, Town of Princeton

Appendices

Appendix A – Figure 1, Radius Map

Appendix B – Table 1, Summary of PFAS Analytical Data

Appendix C – Public Notification Letters and Potable Well Laboratory Reports

Appendix D – Imminent Hazard Evaluation

Appendix E – Laboratory Reports

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PFAS 9-2020_REV2.docx

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APPENDIX A

FIGURE 1 ORTHOPHOTOGRAPH SITE PLAN

LEGEND

Total Regulated PFAS Concentrations in Parts-Per-Trillion (ppt)

- Greater Than 100
- Greater Than 20 But Less Than 100
- Greater Than 2 But Less Than 20
- Non Detect (<2)
- Non-Community Transient Public Water Supply

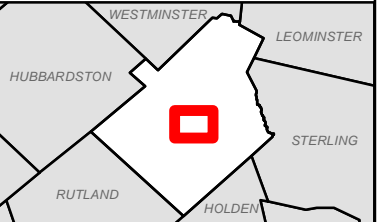
500' Foot Radii Over Time

- Start of Project
- Current Status (2020/06/25)

Affected Property Labels:

- P (Point of Entry Treatment, if present)
- Address
- PFAS 6-Compound Total

LOCUS MAP



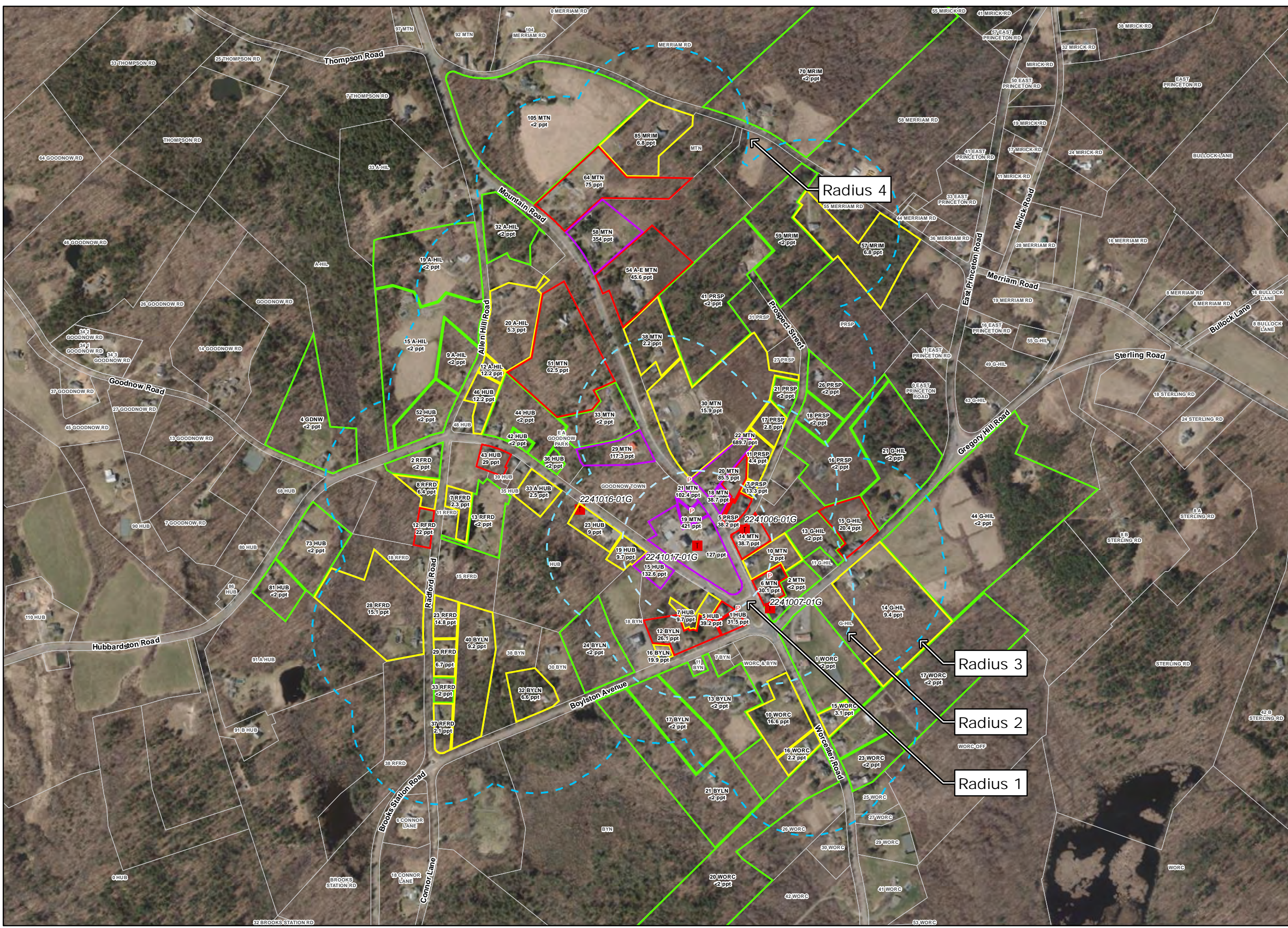
1:7,200

NOTES

1. Based on Google Imagery (2017)
2. 500' Buffer based on a 50' buffer of building structures. Well locations are assumed to be within 50' of each home.
3. Abbreviation Dictionary:
 "ALLEN HILL RD": "A-HIL"
 "BOYLSTON AVE": "BYLN"
 "GREGORY HILL RD": "G-HIL"
 "HUBBARDSTON RD": "HUB"
 "MOUNTAIN RD": "MTN"
 "PROSPECT ST": "PRSP"
 "RADFORD RD": "RFRD"
 "WORCESTER RD": "WORC"
 "MERRIAM": "MRIM"
 "GOODNOW": "GDNW"

Princeton, Massachusetts

August 2020



Tighe&Bond

APPENDIX B

TABLE 1
 Summary of POET Analytical Data
 Princeton, Massachusetts
 RTN 2-21072
 Last Updated: 08/26/2020

Sample ID Sample Type Sample Date	MassDEP MCP GW-1 & Proposed MMCL	7 Boylston Ave															
		1/27/20	1/27/20	Field Blank 1/27/20	INF 3/17/20	MID 3/17/20	EFF 3/17/20	INF 5/1/20	MID 5/1/20	EFF 5/1/20	INF 6/18/20	MID 6/18/20	EFF 6/18/20	INF 7/29/20	MID 7/29/20	EFF 7/29/20	Field Blank 7/29/20
Hydrocarbon (mg/l) Diesel/#2 Fuel	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry (mg/l) Hardness (as CaCO3)	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Solids (Total Dissolved) Chloride	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals 6010 (ug/l) Arsenic	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Calcium	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS - Unregulated (ng/L) 11CI-PF3OUdS (F53B Major)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
9CI-PF3ONS (F53B Minor)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Hexafluoropropylene oxide dimer acid (HFPO-DA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
N-EtFOSAA	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
N-MeFOSAA	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorobutanesulfonic acid (PFBS)	NS	3.7	3.6	<2.0	4.1	<2.0	<2.0	2.2	<2.0	<2.0	4.3	<2.0	<2.0	4.1	<2.0	<2.0	<2.0
Perfluorododecanoic acid (PFDoA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluorohexanoic acid (PFHxA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluorotetradecanoic acid (PFTA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluorotridecanoic acid (PFTrDA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluoroundecanoic acid (PFUnA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
PFAS - Regulated (ng/L) Perfluorodecanoic acid (PFDA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluoroheptanoic acid (PFHpA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorohexanesulfonic acid (PFHxS)	NS	17	16	<2.0	20	<2.0	<2.0	12	<2.0	<2.0	22	<2.0	<2.0	23	<2.0	<2.0	<2.0
perfluorononanoic acid (PFNA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorooctanesulfonic acid (PFOS)	NS	6.2	4.5	4.7	6.2	<2.0	<2.0	3.3	<2.0	<2.0	4.9	<2.0	<2.0	4.1	<2.0	<2.0	<2.0
perfluorooctanoic acid (PFOA)	NS	<2.0	2.7	14	2.8	<2.0	<2.0	2.5	<2.0	<2.0	2.7	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Total Regulated PFAS (ng/L)	20	23	23	19	29	ND	ND	18	ND	ND	30	ND	ND	27	ND	ND	ND
Total PFAS (ng/L)	NS	27	27	19	33	ND	ND	20	ND	ND	34	ND	ND	31	ND	ND	ND

mg/l - milligrams per liter
 ug/l - micrograms per liter
 ng/l - nanograms per liter
 MCP - Massachusetts Contingency Plan
 MMCL is Massachusetts Maximum Containment Level
 PFAS - Per- and Polyfluoroalkyl substances
 NS - No Standard
 <## - Parameter not detected above provided reporting limit
 ND - Analytes in parameter group not detected above reporting limits
 Bold and boxed values indicate exceedances of criteria

TABLE 1
 Summary of POET Analytical Data
 Princeton, Massachusetts
 RTN 2-21072
 Last Updated: 08/26/2020

Sample ID Sample Type Sample Date	MassDEP MCP GW-1 & Proposed MMCL	12 Boylston Ave											15 Gregory Hill Rd											Trip Blank 7/31/20
		1/10/20	3/6/20	INF	MID	EFF	INF	MID	EFF	INF	MID	EFF	1/13/20	3/11/20	3/11/20	3/11/20	6/23/20	6/23/20	6/23/20	7/31/20	7/31/20	7/31/20		
Hydrocarbon (mg/l) Diesel/#2 Fuel	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry (mg/l) Hardness (as CaCO3)	NS	-	360	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Solids (Total Dissolved) Chloride	NS	-	780	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	NS	-	380	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals 6010 (ug/l) Arsenic	NS	-	<0.80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Calcium	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	NS	-	<1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium	NS	-	120,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	NS	-	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS - Unregulated (ng/L) 11CI-PF3OUds (F53B Major)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
9CI-PF3ONS (F53B Minor)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Hexafluoropropylene oxide dimer acid (HFPO-DA)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
N-EtFOSAA	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
N-MeFOSAA	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorobutanesulfonic acid (PFBS)	NS	9.1	-	7.5	<2.0	<2.0	8.9	<2.0	<2.0	<2.0	7.7	<2.0	2.7	3.6	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluorododecanoic acid (PFDoA)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluorohexanoic acid (PFHxA)	NS	<2.0	-	<2.0	<2.0	<2.0	2.1	<2.0	<2.0	<2.0	<2.0	<2.0	2.9	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluorotetradecanoic acid (PFTA)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluorotridecanoic acid (PFTrDA)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluoroundecanoic acid (PFUnA)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
PFAS - Regulated (ng/L) Perfluorodecanoic acid (PFDA)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluoroheptanoic acid (PFHpA)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	4.7	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorohexanesulfonic acid (PFHxS)	NS	14	-	14	<2.0	<2.0	18	<2.0	<2.0	<2.0	17	<2.0	5.2	6.6	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorononanoic acid (PFNA)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorooctanesulfonic acid (PFOS)	NS	6.4	-	5.7	<2.0	<2.0	6.4	<2.0	<2.0	<2.0	5.9	<2.0	5.4	5.4	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorooctanoic acid (PFOA)	NS	5.7	-	5.9	<2.0	<2.0	6.8	<2.0	<2.0	<2.0	4.7	<2.0	5.1	2.2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Total Regulated PFAS (ng/L)	20	26	-	26	ND	ND	31	ND	ND	ND	28	ND	20.4	14.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total PFAS (ng/L)	NS	35	-	33	ND	ND	42	ND	ND	ND	35	ND	26.0	17.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

mg/l - milligrams per liter
 ug/l - micrograms per liter
 ng/l - nanograms per liter
 MCP - Massachusetts Contingency Plan
 MMCL is Massachusetts Maximum Containment Level
 PFAS - Per- and Polyfluoroalkyl substances
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 <## - Parameter not detected above provided reporting limit
 ND - Analytes in parameter group not detected above reporting limits
 Bold and boxed values indicate exceedances of criteria

TABLE 1
 Summary of POET Analytical Data
 Princeton, Massachusetts
 RTN 2-21072
 Last Updated: 08/26/2020

Sample ID Sample Type Sample Date	MassDEP MCP GW-1 & Proposed MMCL	1 Hubbardston Rd														
		INF 1/8/20	MID 3/11/20	EFF 3/11/20	INF 3/11/20	MID 5/1/20	EFF 5/1/20	INF 5/1/20	MID 5/1/20	EFF 5/1/20	INF 6/18/20	MID 6/18/20	EFF 6/18/20	INF 7/29/20	MID 7/29/20	EFF 7/29/20
Hydrocarbon (mg/l) Diesel/#2 Fuel	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry (mg/l) Hardness (as CaCO3)	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Solids (Total Dissolved) Chloride	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals 6010 (ug/l) Arsenic	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Calcium	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS - Unregulated (ng/L) 11CI-PF3OUdS (F53B Major)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
9CI-PF3ONS (F53B Minor)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Hexafluoropropylene oxide dimer acid (HFPO-DA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
N-EtFOSAA	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
N-MeFOSAA	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorobutanesulfonic acid (PFBS)	NS	7.0	5.7	<2.0	<2.0	6.4	<2.0	<2.0	6.5	<2.0	<2.0	6.4	<2.0	<2.0	<2.0	<2.0
Perfluorododecanoic acid (PFDoA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluorohexanoic acid (PFHxA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluorotetradecanoic acid (PFTA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluorotridecanoic acid (PFTrDA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluoroundecanoic acid (PFUnA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
PFAS - Regulated (ng/L) Perfluorodecanoic acid (PFDA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluoroheptanoic acid (PFHpA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorohexanesulfonic acid (PFHxS)	NS	22	19	<2.0	<2.0	21	<2.0	<2.0	24	<2.0	<2.0	23	<2.0	<2.0	<2.0	<2.0
perfluorononanoic acid (PFNA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorooctanesulfonic acid (PFOS)	NS	6.1	5.6	<2.0	<2.0	5.7	<2.0	<2.0	6.2	<2.0	<2.0	5.6	<2.0	<2.0	<2.0	<2.0
perfluorooctanoic acid (PFOA)	NS	3.4	3	<2.0	<2.0	3.1	<2.0	<2.0	2.9	<2.0	<2.0	2.9	<2.0	<2.0	<2.0	<2.0
Total Regulated PFAS (ng/L)	20	32	28	ND	ND	30	ND	ND	33	ND	ND	32	ND	ND	ND	ND
Total PFAS (ng/L)	NS	39	31	ND	ND	36	ND	ND	40	ND	ND	38	ND	ND	ND	ND

mg/l - milligrams per liter
 ug/l - micrograms per liter
 ng/l - nanograms per liter
 MCP - Massachusetts Contingency Plan
 MMCL is Massachusetts Maximum Containment Level
 PFAS - Per- and Polyfluoroalkyl substances
 NS - No Standard
 <## - Parameter not detected above provided reporting limit
 ND - Analytes in parameter group not detected above reporting limits
 Bold and boxed values indicate exceedances of criteria

TABLE 1
 Summary of POET Analytical Data
 Princeton, Massachusetts
 RTN 2-21072
 Last Updated: 08/26/2020

Sample ID Sample Type Sample Date	MassDEP MCP GW-1 & Proposed MMCL	5 Hubbardston Rd														
		12/5/19	12/5/19	12/5/19	Inf	Mid	Eff	INF	MID	EFF	Inf	Mid	Eff	Inf	Mid	Eff
Hydrocarbon (mg/l) Diesel/#2 Fuel	NS	<0.21	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry (mg/l) Hardness (as CaCO3)	NS	-	-	350	-	-	-	-	-	-	-	-	-	-	-	-
Solids (Total Dissolved) Chloride	NS	-	-	670	-	-	-	-	-	-	-	-	-	-	-	-
Metals 6010 (ug/l) Arsenic	NS	-	-	1.3	-	-	-	-	-	-	-	-	-	-	-	-
Calcium	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	NS	-	-	5.7	-	-	-	-	-	-	-	-	-	-	-	-
Sodium	NS	-	-	<50	-	-	-	-	-	-	-	-	-	-	-	-
Iron	NS	-	-	130,000	-	-	-	-	-	-	-	-	-	-	-	-
PFAS - Unregulated (ng/L) 11CI-PF3OUdS (F53B Major)	NS	-	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
9CI-PF3ONS (F53B Minor)	NS	-	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	NS	-	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Hexafluoropropylene oxide dimer acid (HFPO-DA)	NS	-	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
N-EtFOSAA	NS	-	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
N-MeFOSAA	NS	-	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorobutanesulfonic acid (PFBS)	NS	-	8.4	-	6.3	<2.0	<2.0	4.3	<2.0	<2.0	4.6	<2.0	<2.0	7.0	<2.0	<2.0
Perfluorododecanoic acid (PFDoA)	NS	-	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluorohexanoic acid (PFHxA)	NS	-	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluorotetradecanoic acid (PFTA)	NS	-	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluorotridecanoic acid (PFTrDA)	NS	-	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluoroundecanoic acid (PFUnA)	NS	-	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
PFAS - Regulated (ng/L) Perfluorodecanoic acid (PFDA)	NS	-	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluoroheptanoic acid (PFHpA)	NS	-	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorohexanesulfonic acid (PFHxS)	NS	-	29	-	25	<2.0	<2.0	11	<2.0	<2.0	15	<2.0	<2.0	27	<2.0	<2.0
perfluorononanoic acid (PFNA)	NS	-	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorooctanesulfonic acid (PFOS)	NS	-	7.3	-	6.9	<2.0	<2.0	4.9	<2.0	<2.0	4.8	<2.0	<2.0	6.7	<2.0	<2.0
perfluorooctanoic acid (PFOA)	NS	-	2.9	-	2.5	<2.0	<2.0	2.7	<2.0	<2.0	2.9	<2.0	<2.0	2.5	<2.0	<2.0
Total Regulated PFAS (ng/L)	20	-	39	-	34	ND	ND	19	ND	ND	23	ND	ND	36	ND	ND
Total PFAS (ng/L)	NS	-	48	-	41	ND	ND	23	ND	ND	27	ND	ND	43	ND	ND

mg/l - milligrams per liter
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 MCP - Massachusetts Contingency Plan
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TABLE 1
 Summary of POET Analytical Data
 Princeton, Massachusetts
 RTN 2-21072
 Last Updated: 08/26/2020

Sample ID Sample Type Sample Date	MassDEP MCP GW-1 & Proposed MMCL	15 Hubbardston Rd														Trip Blank 7/30/20	19 Hubbardston Rd				
		12/5/19	1/17/20	INF	MID	EFF	INF	MID	EFF	INF	MID	EFF	INF	MID	EFF		12/5/19	2/26/20	6/5/20	6/5/20	6/5/20
Hydrocarbon (mg/l) Diesel/#2 Fuel	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
General Chemistry (mg/l) Hardness (as CaCO3)	NS	-	400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Solids (Total Dissolved) Chloride	NS	-	910	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	NS	-	430	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Metals 6010 (ug/l) Arsenic	NS	-	<0.80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Calcium	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Manganese	NS	-	17	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Sodium	NS	-	160,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Iron	NS	-	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PFAS - Unregulated (ng/L) 11CI-PF3OUdS (F53B Major)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
9CI-PF3ONS (F53B Minor)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Hexafluoropropylene oxide dimer acid (HFPO-DA)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
N-EtFOSAA	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
N-MeFOSAA	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
perfluorobutanesulfonic acid (PFBS)	NS	27	-	17	<2.0	<2.0	21	<2.0	<2.0	21	<2.0	<2.0	20.0	<2.0	<2.0	<2.0	2.9	<2.0	<2.0	<2.0	
Perfluorododecanoic acid (PFDoA)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Perfluorohexanoic acid (PFHxA)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Perfluorotetradecanoic acid (PFTA)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Perfluorotridecanoic acid (PFTrDA)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Perfluoroundecanoic acid (PFUnA)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
PFAS - Regulated (ng/L) Perfluorodecanoic acid (PFDA)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
perfluoroheptanoic acid (PFHpA)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
perfluorohexanesulfonic acid (PFHxS)	NS	110	-	73	<2.0	<2.0	95	<2.0	<2.0	90	<2.0	<2.0	92	<2.0	<2.0	<2.0	9.7	<2.0	5.8	<2.0	
perfluorononanoic acid (PFNA)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
perfluorooctanesulfonic acid (PFOS)	NS	18	-	14	<2.0	<2.0	21	<2.0	<2.0	18	<2.0	<2.0	19	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
perfluorooctanoic acid (PFOA)	NS	4.6	-	3.5	<2.0	<2.0	4.2	<2.0	<2.0	3	<2.0	<2.0	3.9	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Total Regulated PFAS (ng/L)	20	133	-	91	ND	ND	120	ND	ND	111	ND	ND	115	ND	ND	ND	9.7	ND	5.8	ND	
Total PFAS (ng/L)	NS	160	-	108	ND	ND	141	ND	ND	132	ND	ND	135	ND	ND	ND	12.6	ND	5.8	ND	

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TABLE 1
 Summary of POET Analytical Data
 Princeton, Massachusetts
 RTN 2-21072
 Last Updated: 08/26/2020

Sample ID Sample Type Sample Date	MassDEP MCP GW-1 & Proposed MMCL	43 Hubbardston Rd									57 Meriam Rd		
		12/12/19	INF 5/8/20	MID 5/8/20	EFF 5/8/20	INF 6/23/20	MID 6/23/20	EFF 6/23/20	INF 7/31/20	MID 7/31/20	EFF 7/31/20	4/28/20	6/23/20
Hydrocarbon (mg/l) Diesel/#2 Fuel	NS	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry (mg/l) Hardness (as CaCO3)	NS	-	-	-	-	-	-	-	-	-	-	-	-
Solids (Total Dissolved) Chloride	NS	-	-	-	-	-	-	-	-	-	-	-	-
Metals 6010 (ug/l) Arsenic	NS	-	-	-	-	-	-	-	-	-	-	-	-
Calcium	NS	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	NS	-	-	-	-	-	-	-	-	-	-	-	-
Sodium	NS	-	-	-	-	-	-	-	-	-	-	-	-
Iron	NS	-	-	-	-	-	-	-	-	-	-	-	-
PFAS - Unregulated (ng/L) 11CI-PF3OUdS (F53B Major)	NS	<2.0	<2.0	<2.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
9CI-PF3ONS (F53B Minor)	NS	<2.0	<2.0	<2.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	NS	<2.0	<2.0	<2.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Hexafluoropropylene oxide dimer acid (HFPO-DA)	NS	<2.0	<2.0	<2.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
N-EtFOSAA	NS	<2.0	<2.0	<2.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
N-MeFOSAA	NS	<2.0	<2.0	<2.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorobutanesulfonic acid (PFBS)	NS	<2.0	<2.0	<2.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluorododecanoic acid (PFDoA)	NS	<2.0	<2.0	<2.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluorohexanoic acid (PFHxA)	NS	3.5	3.1	<2.0	<4.0	3.1	<2.0	<2.0	2.9	<2.0	<2.0	<2.0	<2.0
Perfluorotetradecanoic acid (PFTA)	NS	<2.0	<2.0	<2.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluorotridecanoic acid (PFTrDA)	NS	<2.0	<2.0	<2.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluoroundecanoic acid (PFUnA)	NS	<2.0	<2.0	<2.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
PFAS - Regulated (ng/L) Perfluorodecanoic acid (PFDA)	NS	<2.0	<2.0	<2.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluoroheptanoic acid (PFHpA)	NS	4.4	4.4	<2.0	<4.0	4.6	<2.0	<2.0	4.5	<2.0	<2.0	<2.0	<2.0
perfluorohexanesulfonic acid (PFHxS)	NS	<2.0	<2.0	<2.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorononanoic acid (PFNA)	NS	<2.0	<2.0	<2.0	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorooctanesulfonic acid (PFOS)	NS	10	10	<2.0	<4.0	12	<2.0	<2.0	9.9	<2.0	<2.0	4.3	<2.0
perfluorooctanoic acid (PFOA)	NS	15	15	<2.0	<4.0	15	<2.0	<2.0	14	<2.0	<2.0	2.5	<2.0
Total Regulated PFAS (ng/L)	20	29	29	ND	ND	32	ND	ND	28	ND	ND	6.8	ND
Total PFAS (ng/L)	NS	33	32	ND	ND	35	ND	ND	31	ND	ND	6.8	ND

mg/l - milligrams per liter
 ug/l - micrograms per liter
 ng/l - nanograms per liter
 MCP - Massachusetts Contingency Plan
 MMCL is Massachusetts Maximum Containment Level
 PFAS - Per- and Polyfluoroalkyl substances
 NS - No Standard
 <## - Parameter not detected above provided reporting limit
 ND - Analytes in parameter group not detected above reporting limits
 Bold and boxed values indicate exceedances of criteria

TABLE 1
 Summary of POET Analytical Data
 Princeton, Massachusetts
 RTN 2-21072
 Last Updated: 08/26/2020

Sample ID Sample Type Sample Date	MassDEP MCP GW-1 & Proposed MMCL	6 Mountain Rd																		
		12/5/19	12/5/19	Inf 2/5/20	Mid 2/5/20	Eff 2/5/20	Field Blank 12/5/19	INF 3/5/20	MID 3/5/20	EFF 3/5/20	Inf 5/8/20	Mid 5/8/20	Eff 5/8/20	Inf 6/23/20	Mid 6/23/20	Eff 6/23/20	Inf 7/29/20	Mid 7/29/20	Eff 7/29/20	
Hydrocarbon (mg/l) Diesel/#2 Fuel	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
General Chemistry (mg/l) Hardness (as CaCO3)	NS	-	370	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Solids (Total Dissolved) Chloride	NS	-	510	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Metals 6010 (ug/l) Arsenic	NS	-	1.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Calcium	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Manganese	NS	-	4.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Sodium	NS	-	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Iron	NS	-	60,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
PFAS - Unregulated (ng/L) 11CI-PF3OUdS (F53B Major)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
9CI-PF3ONS (F53B Minor)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Hexafluoropropylene oxide dimer acid (HFPO-DA)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
N-EtFOSAA	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
N-MeFOSAA	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
perfluorobutanesulfonic acid (PFBS)	NS	8.4	-	3.7	<2.0	<2.0	<2.0	5.8	<2.0	<2.0	4.3	<2.0	<2.0	4.1	<2.0	<2.0	3.7	<2.0	<2.0	
Perfluorododecanoic acid (PFDoA)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Perfluorohexanoic acid (PFHxA)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.5	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Perfluorotetradecanoic acid (PFTA)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Perfluorotridecanoic acid (PFTrDA)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Perfluoroundecanoic acid (PFUnA)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
PFAS - Regulated (ng/L) Perfluorodecanoic acid (PFDA)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
perfluoroheptanoic acid (PFHpA)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
perfluorohexanesulfonic acid (PFHxS)	NS	23	-	12	<2.0	<2.0	<2.0	17	<2.0	<2.0	14	<2.0	<2.0	16	<2.0	<2.0	13	<2.0	<2.0	
perfluorononanoic acid (PFNA)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	3.2	<2.0	<2.0	<2.0	<2.0	<2.0	
perfluorooctanesulfonic acid (PFOS)	NS	4.7	-	4.1	<2.0	<2.0	<2.0	5	<2.0	<2.0	4	<2.0	<2.0	11	<2.0	<2.0	3.5	<2.0	<2.0	
perfluorooctanoic acid (PFOA)	NS	2.4	-	2.1	<2.0	<2.0	<2.0	2.5	<2.0	<2.0	2.5	<2.0	<2.0	8.2	<2.0	<2.0	<2.0	<2.0	<2.0	
Total Regulated PFAS (ng/L)	20	30	-	18	ND	ND	ND	25	ND	ND	20	ND	ND	38	ND	ND	17	ND	ND	
Total PFAS (ng/L)	NS	39	-	22	ND	ND	ND	30	ND	ND	25	ND	ND	45	ND	ND	20	ND	ND	

mg/l - milligrams per liter
 ug/l - micrograms per liter
 ng/l - nanograms per liter
 MCP - Massachusetts Contingency Plan
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TABLE 1
 Summary of POET Analytical Data
 Princeton, Massachusetts
 RTN 2-21072
 Last Updated: 08/26/2020

Sample ID Sample Type Sample Date	MassDEP MCP GW-1 & Proposed MMCL	18 Mountain Rd														
		INF 2/14/20	MID 2/14/20	EFF 2/14/20	INF 3/11/20	MID 3/11/20	EFF 3/11/20	INF 3/11/20	MID 3/11/20	EFF 3/11/20	INF 6/18/20	MID 6/18/20	EFF 6/18/20	INF 7/29/20	MID 7/29/20	EFF 7/29/20
Hydrocarbon (mg/l) Diesel/#2 Fuel	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry (mg/l) Hardness (as CaCO3)	NS	170	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Solids (Total Dissolved) Chloride	NS	210	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals 6010 (ug/l) Arsenic	NS	1.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Calcium	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	NS	1.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium	NS	15,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	NS	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS - Unregulated (ng/L) 11CI-PF3OUdS (F53B Major)	NS	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
9CI-PF3ONS (F53B Minor)	NS	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	NS	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Hexafluoropropylene oxide dimer acid (HFPO-DA)	NS	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
N-EtFOSAA	NS	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
N-MeFOSAA	NS	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorobutanesulfonic acid (PFBS)	NS	-	20	<2.0	<2.0	27	<2.0	<2.0	15	<2.0	<2.0	7.9	<2.0	<2.0	6.8	<2.0
Perfluorododecanoic acid (PFDoA)	NS	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluorohexanoic acid (PFHxA)	NS	-	2.8	<2.0	<2.0	3.1	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluorotetradecanoic acid (PFTA)	NS	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluorotridecanoic acid (PFTrDA)	NS	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluoroundecanoic acid (PFUnA)	NS	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
PFAS - Regulated (ng/L) Perfluorodecanoic acid (PFDA)	NS	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluoroheptanoic acid (PFHpA)	NS	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorohexanesulfonic acid (PFHxS)	NS	-	110	<2.0	<2.0	160	<2.0	<2.0	88	<2.0	<2.0	44	<2.0	<2.0	42	<2.0
perfluorononanoic acid (PFNA)	NS	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorooctanesulfonic acid (PFOS)	NS	-	50	<2.0	<2.0	61	<2.0	<2.0	36	<2.0	<2.0	24	<2.0	<2.0	21	<2.0
perfluorooctanoic acid (PFOA)	NS	-	5.6	<2.0	<2.0	6.4	<2.0	<2.0	4.9	<2.0	<2.0	3.1	<2.0	<2.0	2.4	<2.0
Total Regulated PFAS (ng/L)	20	-	166	ND	ND	227	ND	ND	129	ND	ND	71	ND	ND	66	ND
Total PFAS (ng/L)	NS	-	188	ND	ND	258	ND	ND	144	ND	ND	79	ND	ND	72	ND

mg/l - milligrams per liter
 ug/l - micrograms per liter
 ng/l - nanograms per liter
 MCP - Massachusetts Contingency Plan
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 PFAS - Per- and Polyfluoroalkyl substances
 NS - No Standard
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 Bold and boxed values indicate exceedances of criteria

TABLE 1
Summary of POET Analytical Data
Princeton, Massachusetts
RTN 2-21072
Last Updated: 08/26/2020

Sample ID Sample Type Sample Date	MassDEP MCP GW-1 & Proposed MMCL	19 Mountain Rd																							
		12/4/19	12/27/19	INF	MID	EFF	Field Blank	INF	MID	EFF	Field Blank	INF	MID	EFF	INF	MID	EFF	Trip Blank	INF	MID	EFF	INF	MID	EFF	
Hydrocarbon (mg/l)																									
Diesel/#2 Fuel	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry (mg/l)																									
Hardness (as CaCO3)	NS	-	240	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Solids (Total Dissolved)	NS	-	480	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloride	NS	-	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals 6010 (ug/l)																									
Arsenic	NS	-	1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Calcium	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	NS	-	7.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium	NS	-	71,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	NS	-	<0.050	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS - Unregulated (ng/L)																									
11CI-PF3OUds (F53B Major)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
9CI-PF3ONS (F53B Minor)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Hexafluoropropylene oxide dimer acid (HFPO-DA)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
N-EtFOSAA	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
N-MeFOSAA	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorobutanesulfonic acid (PFBS)	NS	32	-	9.2	<2.0	<2.0	<2.0	28	<2.0	<2.0	<2.0	6.3	<2.0	<2.0	7.1	<2.0	<2.0	<2.0	11	<2.0	<2.0	42	<2.0	<2.0	<2.0
Perfluorododecanoic acid (PFDoA)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluorohexanoic acid (PFHxA)	NS	5.1	-	<2.0	<2.0	<2.0	<2.0	4.4	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.6	<2.0	<2.0	8	<2.0	<2.0	<2.0
Perfluorotetradecanoic acid (PFTA)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluorotridecanoic acid (PFTrDA)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluoroundecanoic acid (PFUnA)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
PFAS - Regulated (ng/L)	NS																								
Perfluorodecanoic acid (PFDA)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluoroheptanoic acid (PFHpA)	NS	2.5	-	<2.0	<2.0	<2.0	<2.0	2.3	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	3.7	<2.0	<2.0	<2.0	<2.0
perfluorohexanesulfonic acid (PFHxS)	NS	220	-	58	<2.0	<2.0	<2.0	190	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	39	<2.0	<2.0	<2.0	71	<2.0	<2.0	350	<2.0	<2.0	<2.0
perfluorononanoic acid (PFNA)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorooctanesulfonic acid (PFOS)	NS	190	-	48	<2.0	<2.0	<2.0	140	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	32	<2.0	<2.0	<2.0	44	<2.0	<2.0	230	<2.0	<2.0	<2.0
perfluorooctanoic acid (PFOA)	NS	11	-	3.5	<2.0	<2.0	<2.0	8.9	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	3.1	<2.0	<2.0	<2.0	4.2	<2.0	<2.0	12	<2.0	<2.0	<2.0
Total Regulated PFAS (ng/L)	20	424	-	110	ND	ND	ND	341	ND	ND	ND	73	ND	ND	70	ND	ND	ND	119	ND	ND	596	ND	ND	ND
Total PFAS (ng/L)	NS	461	-	119	ND	ND	ND	374	ND	ND	ND	79	ND	ND	77	ND	ND	ND	133	ND	ND	646	ND	ND	ND

mg/l - milligrams per liter
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 ng/l - nanograms per liter
 MCP - Massachusetts Contingency Plan
 MMCL is Massachusetts Maximum Containment Level
 PFAS - Per- and Polyfluoroalkyl substances
 NS - No Standard
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TABLE 1
 Summary of POET Analytical Data
 Princeton, Massachusetts
 RTN 2-21072
 Last Updated: 08/26/2020

Sample ID Sample Type Sample Date	MassDEP MCP GW-1 & Proposed MMCL	19 Mountain Rd			20 Mountain Rd														
		INF 7/29/20	MID 7/29/20	EFF 7/29/20	1/10/20	2/14/20	INF 2/14/20	MID 2/14/20	EFF 2/14/20	INF 3/17/20	MID 3/17/20	EFF 3/17/20	INF 6/18/20	MID 6/18/20	EFF 6/18/20	INF 7/29/20	MID 7/29/20	EFF 7/29/20	
Hydrocarbon (mg/l) Diesel/#2 Fuel	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
General Chemistry (mg/l) Hardness (as CaCO3)	NS	-	-	-	-	170	-	-	-	-	-	-	-	-	-	-	-	-	
Solids (Total Dissolved) Chloride	NS	-	-	-	-	210	-	-	-	-	-	-	-	-	-	-	-	-	
Metals 6010 (ug/l) Arsenic	NS	-	-	-	-	3.6	-	-	-	-	-	-	-	-	-	-	-	-	
Calcium	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Manganese	NS	-	-	-	-	<1.0	-	-	-	-	-	-	-	-	-	-	-	-	
Sodium	NS	-	-	-	-	11,000	-	-	-	-	-	-	-	-	-	-	-	-	
Iron	NS	-	-	-	-	<50	-	-	-	-	-	-	-	-	-	-	-	-	
PFAS - Unregulated (ng/L) 11CI-PF3OUdS (F53B Major)	NS	<2.0	<2.0	<2.0	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
9CI-PF3ONS (F53B Minor)	NS	<2.0	<2.0	<2.0	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	NS	<2.0	<2.0	<2.0	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Hexafluoropropylene oxide dimer acid (HFPO-DA)	NS	<2.0	<2.0	<2.0	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
N-EtFOSAA	NS	<2.0	<2.0	<2.0	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
N-MeFOSAA	NS	<2.0	<2.0	<2.0	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
perfluorobutanesulfonic acid (PFBS)	NS	12	<2.0	<2.0	12	-	14	<2.0	<2.0	15	<2.0	<2.0	19	<2.0	<2.0	18	<2.0	<2.0	
Perfluorododecanoic acid (PFDoA)	NS	<2.0	<2.0	<2.0	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Perfluorohexanoic acid (PFHxA)	NS	<2.0	<2.0	<2.0	<2.0	-	2.1	<2.0	<2.0	<2.0	<2.0	<2.0	2.7	<2.0	<2.0	<2.0	<2.0	<2.0	
Perfluorotetradecanoic acid (PFTA)	NS	<2.0	<2.0	<2.0	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Perfluorotridecanoic acid (PFTrDA)	NS	<2.0	<2.0	<2.0	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
Perfluoroundecanoic acid (PFUnA)	NS	<2.0	<2.0	<2.0	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
PFAS - Regulated (ng/L) Perfluorodecanoic acid (PFDA)	NS	<2.0	<2.0	<2.0	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
perfluoroheptanoic acid (PFHpA)	NS	<2.0	<2.0	<2.0	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
perfluorohexanesulfonic acid (PFHxS)	NS	80	<2.0	<2.0	60	-	74	<2.0	<2.0	78	<2.0	<2.0	120	<2.0	<2.0	110	<2.0	<2.0	
perfluorononanoic acid (PFNA)	NS	<2.0	<2.0	<2.0	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	
perfluorooctanesulfonic acid (PFOS)	NS	55	<2.0	<2.0	22	-	28	<2.0	<2.0	30	<2.0	<2.0	44	<2.0	<2.0	44	<2.0	<2.0	
perfluorooctanoic acid (PFOA)	NS	4.0	<2.0	<2.0	3.5	-	4.1	<2.0	<2.0	4.2	<2.0	<2.0	5.2	<2.0	<2.0	4.3	<2.0	<2.0	
Total Regulated PFAS (ng/L)	20	139	ND	ND	86	-	106	ND	ND	112	ND	ND	169	ND	ND	158	ND	ND	
Total PFAS (ng/L)	NS	151	ND	ND	98	-	122	ND	ND	127	ND	ND	191	ND	ND	176	ND	ND	

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TABLE 1
Summary of POET Analytical Data
Princeton, Massachusetts
RTN 2-21072
Last Updated: 08/26/2020

Sample ID Sample Type Sample Date	MassDEP MCP GW-1 & Proposed MMCL	21 Mountain Rd																				
		12/5/19	1/17/20	INF	MID	EFF	Field Blank	INF	MID	EFF	INF	MID	EFF	INF	MID	EFF	INF	MID	EFF	INF	MID	EFF
Hydrocarbon (mg/l)																						
Diesel/#2 Fuel	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry (mg/l)																						
Hardness (as CaCO3)	NS	-	240	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Solids (Total Dissolved)	NS	-	400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloride	NS	-	130	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals 6010 (ug/l)																						
Arsenic	NS	-	1.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Calcium	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	NS	-	21	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium	NS	-	27,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	NS	-	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS - Unregulated (ng/L)																						
11CI-PF3OUdS (F53B Major)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
9CI-PF3ONS (F53B Minor)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Hexafluoropropylene oxide dimer acid (HFPO-DA)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
N-EtFOSAA	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
N-MeFOSAA	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorobutanesulfonic acid (PFBS)	NS	8.2	-	7.5	<2.0	<2.0	<2.0	5.5	<2.0	<2.0	4.3	<2.0	<2.0	7.4	<2.0	<2.0	4	<2.0	<2.0	4.5	<2.0	<2.0
Perfluorododecanoic acid (PFDoA)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluorohexanoic acid (PFHxA)	NS	2.4	-	2.0	<2.0	<2.0	<2.0	2.2	<2.0	<2.0	3.2	<2.0	<2.0	3	<2.0	<2.0	2.4	<2.0	<2.0	2.2	<2.0	<2.0
Perfluorotetradecanoic acid (PFTA)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluorotridecanoic acid (PFTrDA)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluoroundecanoic acid (PFUnA)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
PFAS - Regulated (ng/L)	NS																					
Perfluorodecanoic acid (PFDA)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluoroheptanoic acid (PFHpA)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.1	<2.0	<2.0	3.2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorohexanesulfonic acid (PFHxS)	NS	53	-	47	<2.0	<2.0	<2.0	37	<2.0	<2.0	28	<2.0	<2.0	46	<2.0	<2.0	25	<2.0	<2.0	29	<2.0	<2.0
perfluorononanoic acid (PFNA)	NS	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorooctanesulfonic acid (PFOS)	NS	44	-	37	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	26	<2.0	<2.0	35	<2.0	<2.0	21	<2.0	<2.0	24	<2.0	<2.0
perfluorooctanoic acid (PFOA)	NS	5.4	-	4.6	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	5.4	<2.0	<2.0	4.7	<2.0	<2.0	5.4	<2.0	<2.0	5	<2.0	<2.0
Total Regulated PFAS (ng/L)	20	102	-	89	ND	ND	ND	78	ND	ND	62	ND	ND	89	ND	ND	51	ND	ND	58	ND	ND
Total PFAS (ng/L)	NS	113	-	98	ND	ND	ND	85	ND	ND	69	ND	ND	99	ND	ND	58	ND	ND	65	ND	ND

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TABLE 1
 Summary of POET Analytical Data
 Princeton, Massachusetts
 RTN 2-21072
 Last Updated: 08/26/2020

Sample ID Sample Type Sample Date	MassDEP MCP GW-1 & Proposed MMCL	21 Mountain Rd			29 Mountain Rd																			
		INF 7/31/20	MID 7/31/20	EFF 7/31/20	1/8/20	1/8/20	3/11/20	INF 3/11/20	MID 3/11/20	EFF 3/11/20	INF 5/8/20	MID 5/8/20	EFF 5/8/20	EFF 6/3/20	INF 6/30/20	MID 6/30/20	EFF 6/30/20	EFF 7/14/20	Trip Blank 7/14/20	INF 7/29/20	MID 7/29/20	EFF 7/29/20		
Hydrocarbon (mg/l) Diesel/#2 Fuel	NS	-	-	-	<0.25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry (mg/l) Hardness (as CaCO3)	NS	-	-	-	-	-	350	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Solids (Total Dissolved) Chloride	NS	-	-	-	-	-	760	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals 6010 (ug/l) Arsenic	NS	-	-	-	-	-	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Calcium	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	NS	-	-	-	-	-	<0.80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium	NS	-	-	-	-	-	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	NS	-	-	-	-	-	88,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS - Unregulated (ng/L) 11CI-PF3OUdS (F53B Major)	NS	<2.0	<2.0	<2.0	-	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
9CI-PF3ONS (F53B Minor)	NS	<2.0	<2.0	<2.0	-	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	NS	<2.0	<2.0	<2.0	-	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Hexafluoropropylene oxide dimer acid (HFPO-DA)	NS	<2.0	<2.0	<2.0	-	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
N-EtFOSAA	NS	<2.0	<2.0	<2.0	-	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
N-MeFOSAA	NS	<2.0	<2.0	<2.0	-	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorobutanesulfonic acid (PFBS)	NS	5.6	<2.0	<2.0	-	9.6	-	6.7	<2.0	<2.0	4	<2.0	2.9	<2.0	4.9	<2.0	4.2	<2.0	<2.0	<2.0	5.2	<2.0	<2.0	<2.0
Perfluorododecanoic acid (PFDoA)	NS	<2.0	<2.0	<2.0	-	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluorohexanoic acid (PFHxA)	NS	<2.0	<2.0	<2.0	-	2.5	-	2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.1	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluorotetradecanoic acid (PFTA)	NS	<2.0	<2.0	<2.0	-	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluorotridecanoic acid (PFTrDA)	NS	<2.0	<2.0	<2.0	-	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluoroundecanoic acid (PFUnA)	NS	<2.0	<2.0	<2.0	-	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
PFAS - Regulated (ng/L) Perfluorodecanoic acid (PFDA)	NS	<2.0	<2.0	<2.0	-	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluoroheptanoic acid (PFHpA)	NS	<2.0	<2.0	<2.0	-	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorohexanesulfonic acid (PFHxS)	NS	37	<2.0	<2.0	-	59	-	41	<2.0	<2.0	21	<2.0	16	<2.0	25	<2.0	23	<2.0	<2.0	<2.0	30	<2.0	<2.0	<2.0
perfluorononanoic acid (PFNA)	NS	<2.0	<2.0	<2.0	-	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorooctanesulfonic acid (PFOS)	NS	25.0	<2.0	<2.0	-	53	-	38	<2.0	<2.0	27	<2.0	21	<2.0	21	<2.0	22	<2.0	<2.0	<2.0	22	<2.0	<2.0	<2.0
perfluorooctanoic acid (PFOA)	NS	4.5	<2.0	<2.0	-	5.3	-	5.1	<2.0	<2.0	4.4	<2.0	3.5	<2.0	4.7	<2.0	4.5	<2.0	<2.0	<2.0	3.8	<2.0	<2.0	<2.0
Total Regulated PFAS (ng/L)	20	67	ND	ND	-	117	-	84	ND	ND	52	ND	41	ND	51	<2.0	50	ND	ND	56	ND	ND	ND	ND
Total PFAS (ng/L)	NS	72	ND	ND	-	129	-	93	ND	ND	56	ND	43	ND	56	<2.0	56	ND	ND	61	ND	ND	ND	ND

mg/l - milligrams per liter
 ug/l - micrograms per liter
 ng/l - nanograms per liter
 MCP - Massachusetts Contingency Plan
 MMCL is Massachusetts Maximum Containment Level
 PFAS - Per- and Polyfluoroalkyl substances
 NS - No Standard
 <## - Parameter not detected above provided reporting limit
 ND - Analytes in parameter group not detected above reporting limits
 Bold and boxed values indicate exceedances of criteria

TABLE 1
 Summary of POET Analytical Data
 Princeton, Massachusetts
 RTN 2-21072
 Last Updated: 08/26/2020

Sample ID Sample Type Sample Date	MassDEP MCP GW-1 & Proposed MMCL	51 Mountain Rd											54 Mountain Rd				
		2/12/20	3/6/20	Inf 5/28/20	Mid 5/28/20	Eff 5/28/20	Inf 6/23/20	Mid 6/23/20	Eff 6/23/20	Inf 7/31/20	Mid 7/31/20	Eff 7/31/20	2/26/20	Field Blank 2/26/20	8/5/20	8/5/20	8/5/20
Hydrocarbon (mg/l) Diesel/#2 Fuel	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry (mg/l) Hardness (as CaCO3)	NS	-	260	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Solids (Total Dissolved) Chloride	NS	-	560	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals 6010 (ug/l) Arsenic	NS	-	<0.80	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Calcium	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	NS	-	<1.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium	NS	-	97,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	NS	-	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS - Unregulated (ng/L) 11CI-PF3OUdS (F53B Major)	NS	<4.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
9CI-PF3ONS (F53B Minor)	NS	<4.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	NS	<4.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Hexafluoropropylene oxide dimer acid (HFPO-DA)	NS	<4.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
N-EtFOSAA	NS	<4.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
N-MeFOSAA	NS	<4.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorobutanesulfonic acid (PFBS)	NS	<4.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluorododecanoic acid (PFDoA)	NS	<4.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluorohexanoic acid (PFHxA)	NS	6.9	-	6.1	<2.0	<2.0	5.1	<2.0	<2.0	6.8	<2.0	<2.0	5.2	<2.0	4.2	<2.0	<2.0
Perfluorotetradecanoic acid (PFTA)	NS	<4.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluorotridecanoic acid (PFTrDA)	NS	<4.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluoroundecanoic acid (PFUnA)	NS	<4.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
PFAS - Regulated (ng/L) Perfluorodecanoic acid (PFDA)	NS	<4.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluoroheptanoic acid (PFHpA)	NS	9.5	-	9.4	<2.0	<2.0	9	<2.0	<2.0	11	<2.0	<2.0	7.6	<2.0	6.7	<2.0	<2.0
perfluorohexanesulfonic acid (PFHxS)	NS	<4.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorononanoic acid (PFNA)	NS	<4.0	-	3.0	<2.0	<2.0	2.6	<2.0	<2.0	3.2	<2.0	<2.0	<2.0	<2.0	2.2	<2.0	<2.0
perfluorooctanesulfonic acid (PFOS)	NS	24	-	23	<2.0	2.9	21	<2.0	<2.0	24	<2.0	<2.0	18	<2.0	22	<2.0	<2.0
perfluorooctanoic acid (PFOA)	NS	29	-	29	<2.0	<2.0	28	<2.0	<2.0	30	<2.0	<2.0	20	<2.0	23	<2.0	<2.0
Total Regulated PFAS (ng/L)	20	62	-	64	ND	2.9	61	ND	ND	68	ND	ND	46	ND	54	ND	ND
Total PFAS (ng/L)	NS	69	-	70	ND	2.9	66.0	ND	ND	75	ND	ND	51	ND	58	ND	ND

mg/l - milligrams per liter
 ug/l - micrograms per liter
 ng/l - nanograms per liter
 MCP - Massachusetts Contingency Plan
 MMCL is Massachusetts Maximum Containment Level
 PFAS - Per- and Polyfluoroalkyl substances
 NS - No Standard
 <## - Parameter not detected above provided reporting limit
 ND - Analytes in parameter group not detected above reporting limits
 Bold and boxed values indicate exceedances of criteria

TABLE 1
Summary of POET Analytical Data
Princeton, Massachusetts
RTN 2-21072
Last Updated: 08/26/2020

Sample ID Sample Type Sample Date	MassDEP MCP GW-1 & Proposed MMCL	58 Mountain Rd								64 Mountain Rd										Trip Blank 6/18/20	INF 7/29/20	MID 7/29/20	EFF 7/29/20
		2/26/20	Inf 7/14/20	Mid 7/14/20	Eff 7/14/20	7/31/20	Inf 7/31/20	Mid 7/31/20	Eff 7/31/20	1/30/20	INF 3/3/20	MID 3/3/20	EFF 3/3/20	INF 5/8/20	MID 5/8/20	EFF 5/8/20	INF 6/18/20	MID 6/18/20	EFF 6/18/20				
Hydrocarbon (mg/l) Diesel/#2 Fuel	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry (mg/l) Hardness (as CaCO3)	NS	-	140	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Solids (Total Dissolved) Chloride	NS	-	-	-	-	310	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals 6010 (ug/l) Arsenic	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Calcium	NS	-	54,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Manganese	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium	NS	-	22,000	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	NS	-	-	-	-	<50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS - Unregulated (ng/L) 11CI-PF3OUdS (F53B Major)	NS	<2.0	<2.0	<2.0	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
9CI-PF3ONS (F53B Minor)	NS	<2.0	<2.0	<2.0	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	NS	<2.0	<2.0	<2.0	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Hexafluoropropylene oxide dimer acid (HFPO-DA)	NS	<2.0	<2.0	<2.0	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
N-EtFOSAA	NS	<2.0	<2.0	<2.0	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
N-MeFOSAA	NS	<2.0	<2.0	<2.0	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorobutanesulfonic acid (PFBS)	NS	<2.0	<2.0	<2.0	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluorododecanoic acid (PFDoA)	NS	<2.0	<2.0	<2.0	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluorohexanoic acid (PFHxA)	NS	19	19	<2.0	<2.0	-	3.6	<2.0	<2.0	14	20	<2.0	<2.0	15	<2.0	<2.0	18	<2.0	<2.0	<2.0	2.1	<2.0	<2.0
Perfluorotetradecanoic acid (PFTA)	NS	<2.0	<2.0	<2.0	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluorotridecanoic acid (PFTrDA)	NS	<2.0	<2.0	<2.0	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluoroundecanoic acid (PFUnA)	NS	<2.0	<2.0	<2.0	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
PFAS - Regulated (ng/L) Perfluorodecanoic acid (PFDA)	NS	6.2	6.9	<2.0	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluoroheptanoic acid (PFHpA)	NS	29	31	<2.0	<2.0	-	6.0	<2.0	<2.0	19	23	<2.0	<2.0	18	<2.0	<2.0	22	<2.0	<2.0	<2.0	2.6	<2.0	<2.0
perfluorohexanesulfonic acid (PFHxS)	NS	<2.0	<2.0	<2.0	<2.0	-	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorononanoic acid (PFNA)	NS	20	20	<2.0	<2.0	-	3.5	<2.0	<2.0	<2.0	2.5	<2.0	<2.0	2.2	<2.0	<2.0	2.3	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorooctanesulfonic acid (PFOS)	NS	210	230	<2.0	<2.0	-	35	<2.0	<2.0	22	20	<2.0	<2.0	15	<2.0	<2.0	20	<2.0	<2.0	<2.0	2.4	<2.0	<2.0
perfluorooctanoic acid (PFOA)	NS	89	95	<2.0	<2.0	-	18	<2.0	<2.0	34	44	<2.0	<2.0	34	<2.0	<2.0	43	<2.0	<2.0	<2.0	5.3	<2.0	<2.0
Total Regulated PFAS (ng/L)	20	354	383	ND	ND	-	63	ND	ND	75	90	ND	ND	69	ND	ND	87	ND	ND	ND	10.3	ND	ND
Total PFAS (ng/L)	NS	373	402	ND	ND	-	66	ND	ND	89	110	ND	ND	84	ND	ND	105	ND	ND	ND	12.4	ND	ND

mg/l - milligrams per liter
ug/l - micrograms per liter
ng/l - nanograms per liter
MCP - Massachusetts Contingency Plan
MMCL is Massachusetts Maximum Containment Level
PFAS - Per- and Polyfluoroalkyl substances
NS - No Standard
<## - Parameter not detected above provided reporting limit
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Bold and boxed values indicate exceedances of criteria

TABLE 1
 Summary of POET Analytical Data
 Princeton, Massachusetts
 RTN 2-21072
 Last Updated: 08/26/2020

Sample ID Sample Type Sample Date	MassDEP MCP GW-1 & Proposed MMCL	12 Radford Rd						
		Inf 5/1/20	Mid 6/30/20	Eff 6/30/20	Inf 7/31/20	Mid 7/31/20	Eff 7/31/20	
Hydrocarbon (mg/l) Diesel/#2 Fuel	NS	-	-	-	-	-	-	-
General Chemistry (mg/l) Hardness (as CaCO3)	NS	-	-	-	-	-	-	-
Solids (Total Dissolved) Chloride	NS	-	-	-	-	-	-	-
Metals 6010 (ug/l) Arsenic	NS	-	-	-	-	-	-	-
Calcium	NS	-	-	-	-	-	-	-
Manganese	NS	-	-	-	-	-	-	-
Sodium	NS	-	-	-	-	-	-	-
Iron	NS	-	-	-	-	-	-	-
PFAS - Unregulated (ng/L) 11CI-PF3OUdS (F53B Major)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
9CI-PF3ONS (F53B Minor)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Hexafluoropropylene oxide dimer acid (HFPO-DA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
N-EtFOSAA	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
N-MeFOSAA	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorobutanesulfonic acid (PFBS)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluorododecanoic acid (PFDoA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluorohexanoic acid (PFHxA)	NS	2.4	2.7	<2.0	<2.0	2.3	<2.0	<2.0
Perfluorotetradecanoic acid (PFTA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluorotridecanoic acid (PFTrDA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluoroundecanoic acid (PFUnA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
PFAS - Regulated (ng/L) Perfluorodecanoic acid (PFDA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluoroheptanoic acid (PFHpA)	NS	3.2	3.2	<2.0	<2.0	3.3	<2.0	<2.0
perfluorohexanesulfonic acid (PFHxS)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorononanoic acid (PFNA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorooctanesulfonic acid (PFOS)	NS	8.3	7.5	<2.0	<2.0	8.9	<2.0	<2.0
perfluorooctanoic acid (PFOA)	NS	11	9.8	<2.0	<2.0	11	<2.0	<2.0
Total Regulated PFAS (ng/L)	20	22	20.5	ND	ND	23	ND	ND
Total PFAS (ng/L)	NS	25	23.2	ND	ND	26	ND	ND

mg/l - milligrams per liter
 ug/l - micrograms per liter
 ng/l - nanograms per liter

MCP - Massachusetts Contingency Plan

MMCL is Massachusetts Maximum Containment Level

PFAS - Per- and Polyfluoroalkyl substances

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<## - Parameter not detected above provided reporting limit

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Bold and boxed values indicate exceedances of criteria

TABLE 2
 Summary of Drinking Water Analytical Data
 Princeton, Massachusetts
 RTN 2-21072
 Last Updated: 08/26/2020

Sample ID Sample Type Sample Date	MassDEP MCP GW-1 & Proposed MMCL	9 Allen Hill Rd		12 Allen Hill Rd		15 Allen Hill Rd	19 Allen Hill Rd	20 Allen Hill Rd	32 Allen Hill Rd		13 Boylston Ave		16 Boylston Ave		17 Boylston Ave		21 Boylston Ave Field Blank		
		2/12/20	7/23/20	2/19/20	7/27/20	4/28/20	4/28/20	5/8/20	2/2/20	7/22/20	1/8/20	5/28/20	1/9/20	5/28/20	1/8/20	5/28/20	2/19/20	2/19/20	7/22/20
Hydrocarbon (mg/l) Diesel/#2 Fuel	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry (mg/l) Hardness (as CaCO3)	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloride	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals 6010 (ug/l) Manganese	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS - Unregulated (ng/L) 11Cl-PF3OUdS (F53B Major)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
9Cl-PF3ONS (F53B Minor)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Hexafluoropropylene oxide dimer acid (HFPO-DA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
N-EtFOSAA	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
N-MeFOSAA	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorobutanesulfonic acid (PFBS)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	5.3	6.2	<2.0	<2.0	<2.0	<2.0
Perfluorododecanoic acid (PFDoA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluorohexanoic acid (PFHxA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	3.0	<2.0	<2.0	<2.0	<2.0	<2.0	3.7	3.9	<2.0	<2.0	<2.0	<2.0
Perfluorotetradecanoic acid (PFTA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluorotridecanoic acid (PFTTrDA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluoroundecanoic acid (PFUnA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
PFAS - Regulated (ng/L) Perfluorodecanoic acid (PFDA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluoroheptanoic acid (PFHpA)	NS	<2.0	<2.0	2.2	<2.0	<2.0	<2.0	2.3	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorohexanesulfonic acid (PFHxS)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	4.7	5.2	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorononanoic acid (PFNA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorooctanesulfonic acid (PFOS)	NS	<2.0	<2.0	4.2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	7.2	5.5	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorooctanoic acid (PFOA)	NS	<2.0	<2.0	5.8	<2.0	<2.0	<2.0	3.1	<2.0	<2.0	<2.0	<2.0	8.0	8.9	<2.0	<2.0	<2.0	<2.0	<2.0
Total Regulated PFAS (ng/L)	20	ND	ND	12.2	ND	ND	ND	5.3	ND	ND	ND	ND	19.9	19.6	ND	ND	ND	ND	ND
Total PFAS (ng/L)	NS	ND	ND	12.2	ND	ND	ND	8.3	ND	ND	ND	ND	28.9	29.7	ND	ND	ND	ND	ND

mg/l - milligrams per liter
 ug/l - micrograms per liter
 ng/l - nanograms per liter
 MCP - Massachusetts Contingency Plan
 MMCL is Massachusetts Maximum Containment Level
 PFAS - Per- and Polyfluoroalkyl substances
 NS - No Standard
 <## - Parameter not detected above provided reporting limit
 ND - Analytes in parameter group not detected above reporting limits
 Bold and boxed values indicate exceedances of criteria

TABLE 2
 Summary of Drinking Water Analytical Data
 Princeton, Massachusetts
 RTN 2-21072
 Last Updated: 08/26/2020

Sample ID	MassDEP MCP GW-1 & Proposed MMCL	46 Hubbardston Rd		48 Hubbardston Rd		52 Hubbardston Rd	73 Hubbardston Rd	81 Hubbardston Rd	59 Merriam Rd	70 Merriam Rd		85 Merriam Rd		105 Merriam Rd		2 Mountain Rd	
Sample Type		2/12/20	7/23/20	2/12/20	7/23/20	2/12/20	6/11/20	4/28/20	4/28/20	4/28/20	Trip Blank 4/28/20	2/26/20	7/22/20	2/28/20	7/21/20	1/7/20	6/5/20
Hydrocarbon (mg/l)																	
Diesel/#2 Fuel	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry (mg/l)																	
Hardness (as CaCO3)	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloride	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals 6010 (ug/l)																	
Manganese	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS - Unregulated (ng/L)																	
11Cl-PF3OUdS (F53B Major)	NS	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
9Cl-PF3ONS (F53B Minor)	NS	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	NS	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Hexafluoropropylene oxide dimer acid (HFPO-DA)	NS	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
N-EtFOSAA	NS	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
N-MeFOSAA	NS	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorobutanesulfonic acid (PFBS)	NS	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluorododecanoic acid (PFDoA)	NS	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluorohexanoic acid (PFHxA)	NS	<4.0	2.2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluorotetradecanoic acid (PFTA)	NS	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluorotridecanoic acid (PFTTrDA)	NS	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluoroundecanoic acid (PFUnA)	NS	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
PFAS - Regulated (ng/L)																	
Perfluorodecanoic acid (PFDA)	NS	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluoroheptanoic acid (PFHpA)	NS	<4.0	2.4	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorohexanesulfonic acid (PFHxS)	NS	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.1
perfluorononanoic acid (PFNA)	NS	<4.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorooctanesulfonic acid (PFOS)	NS	6.0	6.2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.7	2.9	<2.0	<2.0	<2.0	<2.0
perfluorooctanoic acid (PFOA)	NS	6.2	8.8	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	4.1	5.1	<2.0	<2.0	<2.0	<2.0
Total Regulated PFAS (ng/L)	20	12.2	17.4	ND	ND	ND	ND	ND	ND	ND	ND	6.8	8.0	ND	ND	ND	2.1
Total PFAS (ng/L)	NS	12.2	19.6	ND	ND	ND	ND	ND	ND	ND	ND	6.8	8.0	ND	ND	ND	2.1

mg/l - milligrams per liter
 ug/l - micrograms per liter
 ng/l - nanograms per liter
 MCP - Massachusetts Contingency Plan
 MMCL is Massachusetts Maximum Containment Level
 PFAS - Per- and Polyfluoroalkyl substances
 NS - No Standard
 <## - Parameter not detected above provided reporting limit
 ND - Analytes in parameter group not detected above reporting limits
 Bold and boxed values indicate exceedances of criteria

TABLE 2
 Summary of Drinking Water Analytical Data
 Princeton, Massachusetts
 RTN 2-21072
 Last Updated: 08/26/2020

Sample ID	MassDEP MCP GW-1 & Proposed MMCL	17 Prospect St		18 Prospect St		21 Prospect St		26 Prospect St			41 Prospect St		2 Radford Rd	7 Radford Rd		8 Radford Rd		11 Radford Rd		
Sample Type		1/8/20	6/5/20	1/8/20	6/5/20	2/5/20	7/22/20	2/6/20	7/23/20	Trip Blank 7/23/20	5/15/20	Trip Blank 5/15/20	2/19/20	2/28/20	7/21/20	2/28/20	7/21/20	2/14/20	7/22/2020	Trip Blank 7/22/20
Sample Date	MMCL																			
Hydrocarbon (mg/l)																				
Diesel/#2 Fuel	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry (mg/l)																				
Hardness (as CaCO3)	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloride	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals 6010 (ug/l)																				
Manganese	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS - Unregulated (ng/L)																				
11Cl-PF3OUdS (F53B Major)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
9Cl-PF3ONS (F53B Minor)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Hexafluoropropylene oxide dimer acid (HFPO-DA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
N-EtFOSAA	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
N-MeFOSAA	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorobutanesulfonic acid (PFBS)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluorododecanoic acid (PFDoA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluorohexanoic acid (PFHxA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluorotetradecanoic acid (PFTA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluorotridecanoic acid (PFTrDA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluoroundecanoic acid (PFUnA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
PFAS - Regulated (ng/L)																				
Perfluorodecanoic acid (PFDA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluoroheptanoic acid (PFHpA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorohexanesulfonic acid (PFHxS)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorononanoic acid (PFNA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorooctanesulfonic acid (PFOS)	NS	2.8	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	2.3	2.7	2.5	3.1	2.3	3.1	<2.0
perfluorooctanoic acid (PFOA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	3.2	3.9	4.1	2.7	3.1	<2.0
Total Regulated PFAS (ng/L)	20	2.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.3	5.9	6.4	7.2	5.0	6.2	ND
Total PFAS (ng/L)	NS	2.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.3	5.9	6.4	7.2	5.0	6.2	ND

mg/l - milligrams per liter
 ug/l - micrograms per liter
 ng/l - nanograms per liter
 MCP - Massachusetts Contingency Plan
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 Princeton, Massachusetts
 RTN 2-21072
 Last Updated: 08/26/2020

Sample ID Sample Type Sample Date	MassDEP MCP GW-1 & Proposed MMCL	13 Radford Rd			23 Radford Rd	28 Radford Rd		29 Radford Rd			33 Radford Rd	37 Radford Rd	18 Sterling Rd (LAV)		
		3/4/20	7/21/20	Trip Blank 7/21/20	7/21/20	1/30/20	7/21/20	3/17/20	Field Blank 3/17/20	7/21/20	5/29/20	4/28/20	3/29/20	3/29/20	Field Blank 3/29/20
Hydrocarbon (mg/l) Diesel/#2 Fuel	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	
General Chemistry (mg/l) Hardness (as CaCO3)	NS	-	-	-	-	-	-	-	-	-	-	-	100	-	
Chloride	NS	-	-	-	-	-	-	-	-	-	-	-	1.3	-	
Metals 6010 (ug/l) Manganese	NS	-	-	-	-	-	-	-	-	-	-	-	<10	-	
Sodium	NS	-	-	-	-	-	-	-	-	-	-	-	5700	-	
Iron	NS	-	-	-	-	-	-	-	-	-	-	-	<50	-	
PFAS - Unregulated (ng/L) 11Cl-PF3OUdS (F53B Major)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	-	<2.0	
9Cl-PF3ONS (F53B Minor)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	-	<2.0	
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	-	<2.0	
Hexafluoropropylene oxide dimer acid (HFPO-DA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	-	<2.0	
N-EtFOSAA	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	-	<2.0	
N-MeFOSAA	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	-	<2.0	
perfluorobutanesulfonic acid (PFBS)	NS	<2.0	<2.0	<2.0	<2.0	2.1	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	-	<2.0	
Perfluorododecanoic acid (PFDoA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	-	<2.0	
Perfluorohexanoic acid (PFHxA)	NS	<2.0	<2.0	<2.0	2.2	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	-	<2.0	
Perfluorotetradecanoic acid (PFTA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	-	<2.0	
Perfluorotridecanoic acid (PFTrDA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	-	<2.0	
Perfluoroundecanoic acid (PFUnA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	-	<2.0	
PFAS - Regulated (ng/L) Perfluorodecanoic acid (PFDA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	-	<2.0	
perfluoroheptanoic acid (PFHpA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	-	<2.0	
perfluorohexanesulfonic acid (PFHxS)	NS	<2.0	<2.0	<2.0	2.8	2.7	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	-	<2.0	
perfluorononanoic acid (PFNA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	-	<2.0	
perfluorooctanesulfonic acid (PFOS)	NS	<2.0	<2.0	<2.0	5.5	7.0	4.0	3.5	<2.0	2.8	<2.0	2.1	<2.0	<2.0	
perfluorooctanoic acid (PFOA)	NS	<2.0	<2.0	<2.0	6.5	5.4	4.6	3.2	<2.0	2.4	<2.0	<2.0	-	<2.0	
Total Regulated PFAS (ng/L)	20	ND	ND	ND	14.8	15.1	8.6	6.7	ND	5.2	ND	2.1	ND	ND	
Total PFAS (ng/L)	NS	ND	ND	ND	17.0	17.2	8.6	6.7	ND	5.2	ND	2.1	ND	ND	

mg/l - milligrams per liter
 ug/l - micrograms per liter
 ng/l - nanograms per liter
 MCP - Massachusetts Contingency Plan
 MMCL is Massachusetts Maximum Containment Level
 PFAS - Per- and Polyfluoroalkyl substances
 NS - No Standard
 <## - Parameter not detected above provided reporting limit
 ND - Analytes in parameter group not detected above reporting limits
 Bold and boxed values indicate exceedances of criteria

TABLE 2
 Summary of Drinking Water Analytical Data
 Princeton, Massachusetts
 RTN 2-21072
 Last Updated: 08/26/2020

Sample ID Sample Type Sample Date	MassDEP MCP GW-1 & Proposed MMCL	1 Worcester Rd			10 Worcester Rd		15 Worcester Rd		16 Worcester Rd		17 Worcester Rd		20 Worcester Rd		23 Worcester Rd	
		1/7/20	6/11/20	Trip Blank 6/11/20	1/9/20	6/11/20	3/6/20	7/21/20	2/5/20	7/29/2020	2/10/20	7/21/20	3/17/20	7/21/20	2/5/20	7/21/20
Hydrocarbon (mg/l) Diesel/#2 Fuel	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
General Chemistry (mg/l) Hardness (as CaCO3)	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chloride	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Metals 6010 (ug/l) Manganese	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sodium	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iron	NS	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS - Unregulated (ng/L) 11Cl-PF3OUdS (F53B Major)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
9Cl-PF3ONS (F53B Minor)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Hexafluoropropylene oxide dimer acid (HFPO-DA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
N-EtFOSAA	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
N-MeFOSAA	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorobutanesulfonic acid (PFBS)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluorododecanoic acid (PFDoA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluorohexanoic acid (PFHxA)	NS	<2.0	<2.0	<2.0	3.8	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluorotetradecanoic acid (PFTA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluorotridecanoic acid (PFTrDA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Perfluoroundecanoic acid (PFUnA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
PFAS - Regulated (ng/L) Perfluorodecanoic acid (PFDA)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluoroheptanoic acid (PFHpA)	NS	<2.0	<2.0	<2.0	8.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorohexanesulfonic acid (PFHxS)	NS	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorononanoic acid (PFNA)	NS	<2.0	<2.0	<2.0	2.7	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorooctanesulfonic acid (PFOS)	NS	<2.0	<2.0	<2.0	2.3	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
perfluorooctanoic acid (PFOA)	NS	<2.0	2.5	<2.0	3.6	3.0	3.1	3.1	2.2	2.6	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Total Regulated PFAS (ng/L)	20	ND	2.5	ND	16.6	3.0	3.1	3.1	2.2	2.6	ND	ND	ND	ND	ND	ND
Total PFAS (ng/L)	NS	ND	2.5	ND	20.4	3.0	3.1	3.1	2.2	2.6	ND	ND	ND	ND	ND	ND

mg/l - milligrams per liter
 ug/l - micrograms per liter
 ng/l - nanograms per liter
 MCP - Massachusetts Contingency Plan
 MMCL is Massachusetts Maximum Containment Level
 PFAS - Per- and Polyfluoroalkyl substances
 NS - No Standard
 <## - Parameter not detected above provided reporting limit
 ND - Analytes in parameter group not detected above reporting limits
 Bold and boxed values indicate exceedances of criteria

Tighe&Bond

APPENDIX C

APPENDIX C

(Sent as separate file to MassDEP)

Tighe&Bond

APPENDIX D



September 9, 2020

Mr. Jeffrey L. Arps, LSP
Director, Remediation and Field Services
Tighe & Bond
53 Southampton Road, Westfield, Massachusetts 01085

**Re: Focused Imminent Hazard Evaluation
6 Town Hall Drive, Princeton, Massachusetts
RTN 2-0021072**

Dear Mr. Arps,

Sovereign Consulting Inc. (Sovereign) has prepared a Massachusetts Contingency Plan (MCP) imminent hazard evaluation (IHE) for consumption of groundwater containing per- and polyfluorinated alkyl substances (PFAS compounds) from the Princeton, Massachusetts, Town Hall well and groundwater concentration percentiles representative of impacted residential locations in residential wells within Princeton. This letter report summarizes the IHE calculations and conclusions.

Background

On November 25, 2019, a Notice of Responsibility was issued by the Massachusetts Department of Environmental Protection (MassDEP) to the Town of Princeton after MassDEP was notified of the detection of PFAS compounds in the Town Hall complex public drinking water supply well. The PFAS concentration reportedly detected was 125 nanograms per liter (ng/L) (the same as parts per trillion [ppt]), above the then-applicable MassDEP drinking water guideline of 70 ppt. The location and nature of the release is unclear, but is believed to originate from the use of aqueous film-forming foam (AFFF). Immediate response actions were taken, which included provision of bottled water or water treatment for every location serviced by the Town Hall well, signage, and sampling and analysis of all public and private drinking water wells within 500 feet of the Town Hall well. Ongoing monitoring of wells is underway.

Recently, MassDEP promulgated new regulations for PFAS compounds in drinking water that replaced the former drinking water guideline value of 70 ppt with a Massachusetts Maximum Contaminant Level (MMCL) of 0.02 ppt for the sum of six specific PFAS compounds (referred to herein as PFAS-6).^[1] Based on sampling conducted through August 2020, numerous public or private water intakes were found to contain PFAS-6 concentrations above 20 ppt. The concern raised was whether, and where, PFAS-6 compounds constitute an imminent hazard if the water is consumed untreated. Therefore, a human health Imminent Hazard Evaluation (IHE) has been performed to quantify potential imminent hazards.

[1] The PFAS-6 compounds regulated under the MCP are perfluorohexanesulfonic acid (PFHxS), perfluoroheptanoic acid (PFHpA), perfluorooctanoic acid (PFOA), perfluorononanoic acid (PFNA), and perfluorodecanoic acid (PFDA).

Human Health Imminent Hazard Evaluation

The MCP requires that IHEs be conducted separately for human health, the environment, and safety. According to 310 CMR 40.0321(1)(d), a release of oil and/or hazardous material that poses a significant risk of harm to human health when present even for a short period of time constitutes an imminent hazard. A short period of time is defined by the MCP as five years, unless site circumstances indicate that a shorter period of time is appropriate. More specifically, the MCP and other MassDEP guidance specify the following criteria for identifying the presence of an imminent hazard to human health:

- A Hazard Index (HI) (or equivalent ratio of exposure) equal to one (1) for oil or hazardous materials that have the potential to cause serious effects (including but not limited to lethal, developmental, or neurological effects) following short-term exposure [310 CMR 40.0995(2)(c)(1)];
- A Hazard Index equal to ten (10) for all other oil or hazardous materials [310 CMR 40.0995(2)(c)(2)];
- An excess lifetime cancer risk greater than 1 in 100,000 (i.e., 1×10^{-5}) over a short exposure period (e.g., a 5-year exposure period) [310 CMR 40.0995(2)(b)]; and,
- An excess lifetime cancer risk greater than 1 in 10,000 (e.g., 1×10^{-4}) over a long exposure period (MassDEP 1995).

Note that PFAS compounds are not currently regulated as carcinogens, so only the non-carcinogenic HI is calculated in the IHE.

MassDEP has reportedly indicated that a PFAS-6 drinking water concentration of 100 ng/L (ppt) is the limit for an imminent hazard, although not documented anywhere. It is not clear whether MassDEP has selected an HI of 1 or 10 as the maximum acceptable HI for an imminent hazard; however, as attached calculations show, it appears that a HI of 1 was adopted by MassDEP as the imminent hazard limit since PFAS compounds are developmental toxins.

Potential human health imminent hazards were assessed using representative PFAS-6 data from the Town Hall well (**Table 1** – *Summary of Groundwater Analytical Data – Town Hall Well*) and selected PFAS-6 concentrations/percentiles (maximum, 90th percentile, and 50th percentile) in samples from surrounding properties (**Table 2** – *Summary of Groundwater Analytical Data – Residential Wells*). In locations that currently have a point-of-entry treatment (POET) system, the untreated influent concentration was used in defining percentile concentrations. In addition, PFAS-6 concentrations in water associated with an HI of 1 and 10 were back-calculated from rearranged imminent hazard calculations.

Exposure factors used by MassDEP to derive the MMCL standard (which is also the MCP Method 1 GW-1 standard for PFAS-6 compounds) differ slightly from those presented in the MCP short forms for an imminent hazard evaluation for residential drinking water consumption. For the MMCL, MassDEP adopted a lactating woman as the receptor, at a body weight of 60 kilograms (kg) and a daily water intake of 3.2 liters (the MMCL approach). Conventional imminent hazard calculations assume a drinking water intake of 1 liter per day for a 14.6 kilogram child. To be consistent with MassDEP's current approach for PFAS-6 compounds, the MMCL approach is applied.

A non-carcinogenic oral reference dose (RfD) for PFAS-6 derived by MassDEP (2019) of 5×10^{-6} mg/kg-day was applied to assess potential imminent hazards. This value applies to both chronic and subchronic exposures.^[2]

Calculations are presented in **Appendix A**. Results of the imminent hazard evaluation are summarized in the table below:

Location	Applied PFAS-6 Concentration		Treatment System Status	Non-carcinogenic Hazard Index
	Type	ng/L [ppt]		
Town Hall Well	Maximum	234	No POET	2.5
Residences	Maximum	692	POET recently installed ^[1]	7.4
Residences	90 th percentile	115	n/a	1.2
Residences	50 th percentile	28	n/a	0.3
MMCL/GW-1 Standard	Point estimate	20	n/a	0.2
Reported IHE Level	Point estimate	100	n/a	1.1 (rounded to 1)
Maximum Acceptable HI for an Imminent Hazard				1

ng/L Nanograms per liter/Parts per trillion (ppt).

n/a Not applicable.

[1] POET was recently installed; no post-effluent data have yet been collected for analysis.

Assuming that an HI of 1 has been adopted by MassDEP to define an imminent hazard for PFAS-6 compounds, consumption of the maximum concentration of PFAS-6 compounds in water from the Town Hall well results in an imminent hazard.

While consumption of the maximum untreated PFAS-6 concentration from the 22 Mountain Road well is calculated to pose an imminent hazard, no one is currently exposed to this concentration because a POET system was just recently installed (post-POET effluent samples are not yet available). The 90th percentile residential concentration (not location-specific) also poses an imminent hazard. If an HI of 10 defines an imminent hazard for PFAS-6 compounds, none of the locations/scenarios result in an imminent hazard.

All effluent samples collected to date, except for a few in which sampling errors occurred, have had no detections of PFAS compounds. No breakthrough of the POET system carbon vessels has occurred. Full data tables should be consulted for these effluent data.

Back-calculation of the maximum acceptable limit for an imminent hazard through water consumption was calculated to reveal the basis of the MassDEP 100 ppt limit. This calculation is presented in **Appendix A** and the result is shown below:

Exposure Assumption	Target Imminent Hazard Maximum Level	Maximum Acceptable Water Concentration (ng/L) [ppt]
Consistent with MMCL Approach	1	94

^[2] MassDEP (2019) Technical Support Document, Per- and Polyfluoroalkyl Substances (PFAS): An Updated Subgroup Approach to Groundwater and Drinking Water Values (December 26).

The PFAS-6 concentration of 94 ng/L, assuming a maximum acceptable HI of one, would round up to 100 ppt. This is the presumed basis of the reported, but not documented, MassDEP IHE limit of 100 ppt (also easily calculated as the MMCL of 20 ng/L multiplied by 5, since the HI of the MMCL was set at an HI of 0.2).

Imminent Hazard Evaluation for the Environment

The risk of an imminent hazard to the environment is not considered complete at this time since the nearest water body, a wetland/intermittent stream, is located slightly greater 500 feet from the site (refer to **Figure 1** - *MassDEP Phase I Site Assessment Map*). However, typically, an environment imminent hazard assessment considers the presence of the following conditions:

- Evidence of stressed biota attributable to the release at the disposal site, including, without limitation, fish kills or abiotic conditions; or
- Release to the environment of oil or hazardous material which produces immediate or acute adverse impacts to freshwater or saltwater fish populations.

None of these conditions have been reported associated with the release. Since PFAS compounds are present in groundwater, it is unlikely that any terrestrial environmental receptor would be appreciably exposed. Similarly, because of the distance to the nearest surface water body, no imminent hazard to aquatic organisms is expected. MassDEP has adopted a surface water benchmark concentration of 19,000 ppt for PFHxS and PFOS and 1,705,000 ppt (1,705 µg/L) for the remaining PFAS-6 compounds. The highest PFAS-6 concentration detected in water to date was 3,642 ng/L (ppt), which was detected in surface runoff from Mountain Road, not groundwater.

Imminent Hazard Evaluation for Safety

The risk of an imminent hazard to safety considers the presence of the following and similar conditions at the site:

- The presence of rusted or corroded drums or containers, open pits, lagoons, or other dangerous structures;
- Threat of fire or explosion or the presence of explosive vapors resulting from the release; and,
- Presence of uncontained materials that exhibit characteristics of corrosivity, reactivity or flammability.

None of these conditions has been reported in connection with the present of PFAS compounds in groundwater.

In summary, the detected concentrations of PFAS-6 compounds in the Town Hall well pose an imminent hazard if consumed. The maximum detected concentration of PFAS-6 at 22 Mountain Road posed an imminent hazard prior to recent installation of a POET system; however, no exposure is currently occurring to this concentration and no imminent hazard currently exists (effluent samples are not yet available). The 90th percentile concentration also poses an imminent hazard, but this is not location-specific and includes the maximum influent concentration from 22 Mountain Road. The basis of the reported 100 ppt maximum acceptable

concentration of PFAS-6 compounds for an IHE has been confirmed and is recommended to be applied when evaluating at-the-tap concentrations of PFAS-6 in drinking water.

Please contact the undersigned for any questions regarding this IHE.

Regards,

SOVEREIGN CONSULTING INC.

A handwritten signature in black ink, appearing to read "C. Fuller".

Cynthia Fuller
Health Risk Assessor

Attachments

FIGURE

MassDEP - Bureau of Waste Site Cleanup

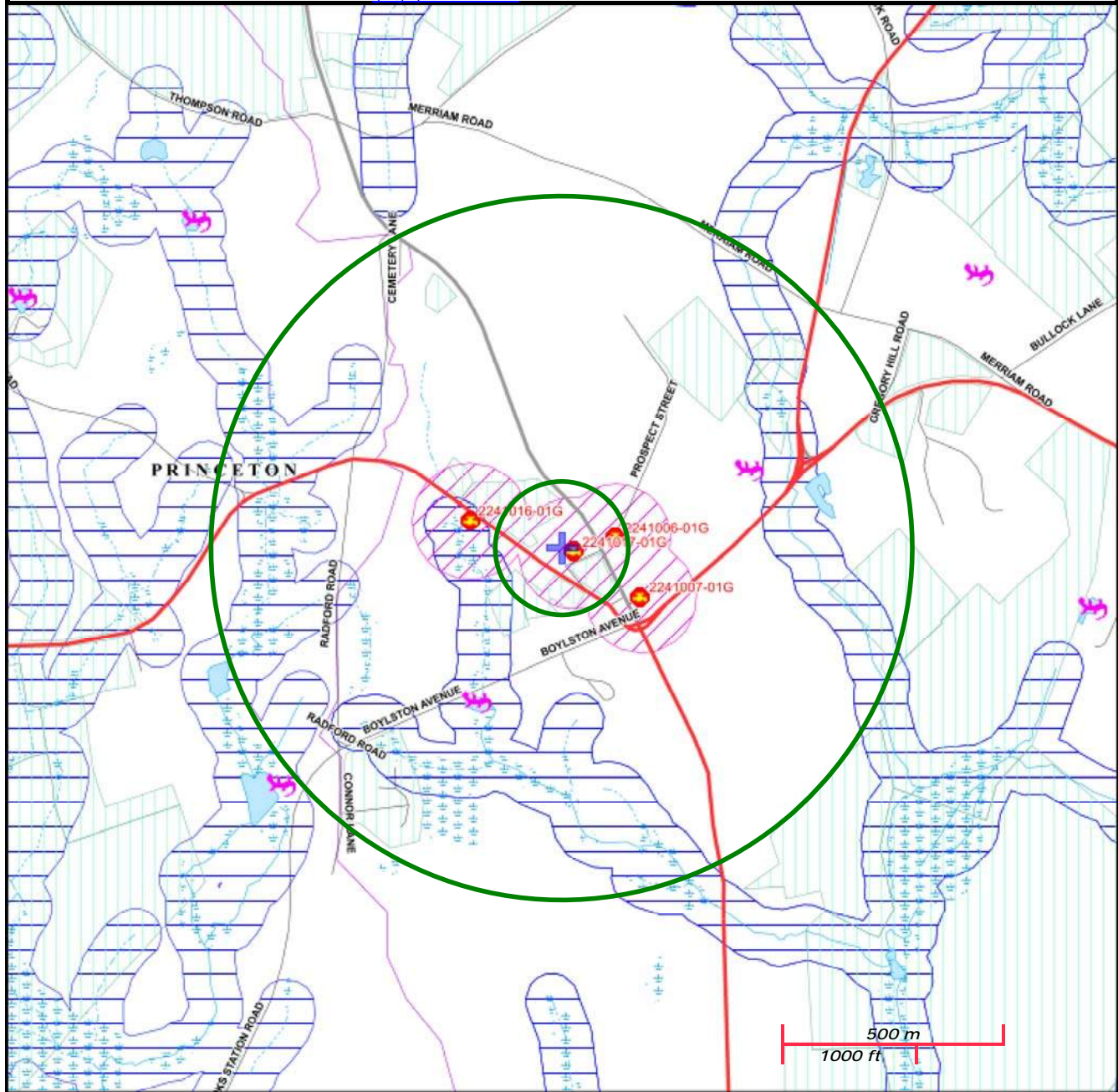
Phase 1 Site Assessment Map: 500 feet & 0.5 Mile Radii

Site Information:

6 TOWN HALL DRIVE PRINCETON, MA

NAD83 UTM Meters:
4703747mN, 263255mE (Zone: 19)
September 4, 2020

The information shown is the best available at the date of printing. However, it may be incomplete. The responsible party and LSP are ultimately responsible for ascertaining the true conditions surrounding the site. Metadata for data layers shown on this map can be found at:
<https://www.mass.gov/orgs/massgis-bureau-of-geographic-information>.



Roads: Limited Access, Divided, Other Hwy, Major Road, Minor Road, Track, Trail	PWS Protection Areas: Zone II, IWPA, Zone A
Boundaries: Town, County, DEP Region; Train; Powerline; Pipeline; Aqueduct	Hydrography: Open Water, PWS Reservoir, Tidal Flat
Basins: Major, PWS; Streams: Perennial, Intermittent, Man Made Shore, Dam	Wetlands: Freshwater, Saltwater, Cranberry Bog
Aquifers: Medium Yield, High Yield, EPA Sole Source	FEMA 100yr Floodplain; Protected Open Space; ACEC
Non Potential Drinking Water Source Area: Medium, High (Yield)	Est. Rare Wetland Wildlife Hab; Vernal Pool: Cert., Potential
	Solid Waste Landfill; PWS: Com. GW, SW, Emerg., Non-Com.

FIGURE 1
MassDEP Phase 1 Site Assessment Map
6 Town Hall Drive, Princeton, Massachusetts

TABLES

TABLE 1
Summary of Groundwater Analytical Data - Town Hall Well
 6 Town Hall Drive Princeton, Massachusetts

Parameter	Town Well (WELL-01G) (ng/L)			
	9/5/2019	9/27/2019	1/8/2020	6/23/2020
Perfluorohexanesulfonic acid (PFHxS)	94.4	78.1	168	81.7
Perfluoroheptanoic acid (PFHpA)	1.82 U	1.87 U	2.47	1.25 J
Perfluorooctanoic acid (PFOA)	3.92	3.18	9.52	4.48
Perfluorooctanesulfonic acid (PFOS)	26.4	18.9	52.6	23.5
Perfluorononanoic acid (PFNA)	1.82 U	1.87 U	1.84 U	1.9 U
Perfluorodecanoic acid (PFDA)	1.82 U	1.87 U	1.84 U	1.9 U
Sum Total - Regulated Total ^[1]	127	103	234	113
Massachusetts Maximum Contaminant Level (MMCL) ^[2]	20			
Imminent Hazard Maximum Level	100			

Only regulated PFAS-6 compounds are presented.

All units are nanograms per liter (ng/L) (same as parts-per trillion [ppt]).

Value Exceeds Imminent Hazard Maximum Level

U Not detected at reporting limit presented.

J Estimated concentration.

[1] Non-detections included at one-half reporting limit.

[2] Updated MCP Method 1 standards (2019).

TABLE 2
Summary of Residential Well Analytical Data - PFAS-6
 Princeton, Massachusetts

Address	Sampling Date	Status of Treatment	Perfluorohexane-sulfonic acid (PFHxS)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorooctane-sulfonic acid (PFOS)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Total Regulated PFAS-6
			ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L
12 Allen Hill Rd	02/14/20	No POET	2.0 U	2.2	5.8	4.2	2.0 U	2.0 U	15
20 Allen Hill Rd	05/08/20	No POET	2.0 U	2.3	3.0	2.0 U	2.0 U	2.0 U	9.3
7 Boylston Ave	01/27/20	No POET - Max Primary / Duplicate	17	2.0 U	2.0 UB	6.2 UB	2.0 U	2.0 U	27
	03/17/20	Post-POET Influent	20	2.0 U	2.8	6.2	2.0 U	2.0 U	32
	05/01/20	Post-POET Influent	12	2.0 U	2.5	3.3	2.0 U	2.0 U	21
	06/18/20	Post-POET Influent	22	2.0 U	2.7	4.9	2.0 U	2.0 U	33
	07/29/20	Post-POET Influent	23	2.0 U	2.0 UB	4.1	2.0 U	2.0 U	31
12 Boylston Ave	01/10/20	No POET	14	2.0 U	5.7	6.4	2.0 U	2.0 U	29
	05/01/20	Post-POET Influent	14	2.0 U	5.9	5.7	2.0 U	2.0 U	29
	06/23/20	Post-POET Influent	18	2.0 U	6.8	6.4	2.0 U	2.0 U	34
	07/31/20	Post-POET Influent	17	2.0 U	4.7	5.9	2.0 U	2.0 U	31
16 Boylston Ave	01/09/20	No POET	4.7	2.0 U	8.0	7.2	2.0 U	2.0 U	23
	05/28/20	No POET	5.2	2.0 U	8.9	5.5	2.0 U	2.0 U	23
32 Boylston Ave	05/28/20	No POET	2.0 U	2.0 U	3.7	2.9	2.0 U	2.0 U	11
40 Boylston Ave	04/28/20	No POET	2.0 U	2.0 U	5.3	3.9	2.0 U	2.0 U	13
14 Gregory Hill Rd	01/09/20	No POET	3.7	2.0 U	3.2	2.5	2.0 U	2.0 U	12
	05/29/20	No POET	5.2	2.0 U	3.4	2.7	2.0 U	2.0 U	14
15 Gregory Hill Rd	01/13/20	No POET	5.2	4.7	5.1	5.4	2.0 U	2.0 U	22
	03/11/20	Post-POET Influent	6.6	2.0 U	2.2	5.4	2.0 U	2.0 U	17
1 Hubbardston Rd	01/08/20	No POET	22	2.0 U	3.4	6.1	2.0 U	2.0 U	35
	03/11/20	Post-POET Influent	19	2.0 U	3.0	5.6	2.0 U	2.0 U	31
	05/01/20	Post-POET Influent	21	2.0 U	3.1	5.7	2.0 U	2.0 U	33
	06/18/20	Post-POET Influent	24	2.0 U	2.9	6.2	2.0 U	2.0 U	36
	07/29/20	Post-POET Influent	23	2.0 U	2.9	5.6	2.0 U	2.0 U	35
5 Hubbardston Rd	12/05/19	No POET	29	2.0 U	2.9	7.3	2.0 U	2.0 U	42
	02/05/20	Post-POET Influent	25	2.0 U	2.5	6.9	2.0 U	2.0 U	37
	03/05/20	Post-POET Influent	11	2.0 U	2.7	4.9	2.0 U	2.0 U	22
	05/01/20	Post-POET Influent	15	2.0 U	2.9	4.8	2.0 U	2.0 U	26
	06/30/20	Post-POET Influent	17	2.0 U	2.6	5.5	2.0 U	2.0 U	28
	08/05/20	Post-POET Influent	27	2.0 U	2.5	6.7	2.0 U	2.0 U	39
7 Hubbardston Rd	12/05/19	No POET	3.5	2.0 U	2.9	3.3	2.0 U	2.0 U	13
	06/05/20	No POET	5.8	2.0 U	2.4	3.5	2.0 U	2.0 U	15
15 Hubbardston Rd	12/05/19	No POET	110	2.0 U	4.6	18	2.0 U	2.0 U	136
	02/26/20	Post-POET Influent	73	2.0 U	3.5	14	2.0 U	2.0 U	94
	05/01/20	Post-POET Influent	95	2.0 U	4.2	21	2.0 U	2.0 U	123
	06/18/20	Post-POET Influent	90	2.0 U	3.0	18	2.0 U	2.0 U	114
	07/30/20	Post-POET Influent	92	2.0 U	3.9	19	2.0 U	2.0 U	118
19 Hubbardston Rd	12/05/19	No POET	9.7	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	15
	06/05/20	Post-POET influent	5.8	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	11
23 Hubbardston Rd	01/10/20	No POET	2.0 U	2.0 U	4.9	4.1	2.0 U	2.0 U	13
	01/27/20	No POET	2.0 U	2.0 U	5.0	3.7	2.0 U	2.0 U	13
	05/29/20	No POET	2.0 U	2.0 U	4.1	3.3	2.0 U	2.0 U	11
33 Hubbardston Rd	02/05/20	No POET	2.0 U	2.0 U	2.0 U	2.5	2.0 U	2.0 U	7.5
	07/23/20	No POET	2.0 U	2.0 U	2.1	2.1	2.0 U	2.0 U	8.2
36 Hubbardston Rd	07/22/20	No POET	2.0 U	2.0 U	5.4	5.0	2.0 U	2.0 U	14

TABLE 2
Summary of Residential Well Analytical Data - PFAS-6
 Princeton, Massachusetts

Address	Sampling Date	Status of Treatment	Perfluorohexane-sulfonic acid (PFHxS)		Perfluoroheptanoic acid (PFHpA)		Perfluorooctanoic acid (PFOA)		Perfluorooctane-sulfonic acid (PFOS)		Perfluorononanoic acid (PFNA)		Perfluorodecanoic acid (PFDA)		Total Regulated PFAS-6
			ng/L	U	ng/L	U	ng/L	U	ng/L	U	ng/L	U	ng/L	U	ng/L
42 Hubbardston Rd	02/10/20	No POET	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	6.0
	07/23/20	No POET - Max of Primary/Duplicate	2.0	U	2.0	U	7.8		8.5		2.0	U	2.0	U	20
43 Hubbardston Rd	12/12/19	No POET	2.0	U	4.4		15		10		2.0	U	2.0	U	32
	05/08/20	Post-POET Influent	2.0	U	4.4		15		10		2.0	U	2.0	U	32
	06/23/20	Post-POET Influent	2.0	U	4.6		15		12		2.0	U	2.0	U	35
	07/31/20	Post-POET Influent	2.0	U	4.5		14		9.9		2.0	U	2.0	U	31
44 Hubbardston Rd	07/23/20	No POET	4.0	U	2.1		7.1		5.6		4.0	U	4.0	U	21
46 Hubbardston Rd	02/12/20	No POET	2.0	U	2.0	U	6.2		6.0		2.0	U	2.0	U	16
	07/23/20	No POET	2.0	U	2.4		8.8		6.2		2.0	U	2.0	U	20
57 Merriam Rd	04/28/20	POET, Effluent	2.0	U	2.0	U	2.5		4.3		2.0	U	2.0	U	11 [2]
85 Merriam Rd	02/26/20	No POET	2.0	U	2.0	U	4.1		2.7		2.0	U	2.0	U	11
	07/22/20	No POET	2.0	U	2.0	U	5.1		2.9		2.0	U	2.0	U	12
2 Mountain Rd	06/05/20	No POET	2.1		2.0	U	2.0	U	2.0	U	2.0	U	2.0	U	7.1
6 Mountain Rd	12/05/19	No POET	23		2.0	U	2.4		4.7		2.0	U	2.0	U	33
	02/05/20	Post-POET Influent	12		2.0	U	2.1		4.1		2.0	U	2.0	U	21
	03/05/20	Post-POET Influent	17		2.0	U	2.5		5.0		2.0	U	2.0	U	28
	05/08/20	Post-POET Influent	14		2.0	U	2.5		4.0		2.0	U	2.0	U	24
	06/23/20	Post-POET Influent	16		2.0	U	8.2		11		3.2		2.0	U	40
	07/29/20	Post-POET Influent	13		2.0	U	2.0	U	3.5		2.0	U	2.0	U	21
10 Mountain Rd	12/05/19	No POET	2.0	U	2.0	U	2.0	U	2.0		2.0	U	2.0	U	7.0
	06/11/20	No POET	4.5		2.0	U	3.4		3.0		2.0	U	2.0	U	14
14 Mountain Rd	01/09/20	No POET	30		2.0	U	2.6		6.1		2.0	U	2.0	U	42
	01/22/20	No POET	35		2.0	U	2.3		7.8		2.0	U	2.0	U	48
	05/29/20	No POET	33		2.0	U	3.3		7.0		2.0	U	2.0	U	46
18 Mountain Rd	01/10/20	No POET	150		2.0	U	6.4		61.0		2.0	U	2.0	U	220
	02/14/20	Post-POET Influent	110		2.0	U	5.6		50		2.0	U	2.0	U	169
	03/11/20	Post-POET Influent	160		2.0	U	6.4		61		2.0	U	2.0	U	230
	05/01/20	Post-POET Influent	88		2.0	U	4.9		36		2.0	U	2.0	U	132
	06/18/20	Post-POET Influent	44		2.0	U	3.1		24		2.0	U	2.0	U	74
	07/29/20	Post-POET Influent	42		2.0	U	2.4		21		2.0	U	2.0	U	68
19 Mountain Rd	12/04/19	No POET	220		2.5		11		190		2.0	U	2.0	U	426
	01/10/20	Post-POET Influent	58		2.0	U	3.5		48		2.0	U	2.0	U	113
	01/17/20	Post-POET Influent	190		2.3		8.9		140		2.0	U	2.0	U	343
	01/31/20	Post-POET Influent	38		2.0	U	3.0		32		2.0	U	2.0	U	76
	03/03/20	Post-POET Influent	39		2.0	U	3.1		28		2.0	U	2.0	U	73
20 Mountain Rd	01/10/20	No POET	60		2.0	U	3.5		22		2.0	U	2.0	U	89
	02/14/20	Post-POET Influent	74		2.0	U	4.1		28		2.0	U	2.0	U	109
	03/17/20	Post-POET Influent	78		2.0	U	4.2		30		2.0	U	2.0	U	115
	06/18/20	Post-POET Influent	120		2.0	U	5.2		44		2.0	U	2.0	U	172
	07/29/20	Post-POET Influent	110		2.0	U	4.3		44		2.0	U	2.0	U	161
21 Mountain Rd	12/05/20	No POET	53		2.0	U	5.4		44		2.0	U	2.0	U	105
	01/24/20	Post-POET Influent	47		2.0	U	4.6		37		2.0	U	2.0	U	92
	01/31/20	Post-POET Influent	37		2.0	U	5.7		35		2.0	U	2.0	U	81
	02/07/20	Post-POET Influent	28		2.1		5.4		26		2.0	U	2.0	U	64
	03/17/20	Post-POET Influent	46		3.2		4.7		35		2.0	U	2.0	U	91
	05/08/20	Post-POET Influent	25		2.0	U	5.4		21		2.0	U	2.0	U	54
	06/30/20	Post-POET Influent	29		2.0	U	5.0		24		2.0	U	2.0	U	61
	07/31/20	Post-POET Influent	37		2.0	U	4.5		25		2.0	U	2.0	U	70

TABLE 2
Summary of Residential Well Analytical Data - PFAS-6
 Princeton, Massachusetts

Address	Sampling Date	Status of Treatment	Perfluorohexane-sulfonic acid (PFHxS)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorooctane-sulfonic acid (PFOS)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Total Regulated PFAS-6
			ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L
22 Mountain Rd	07/31/20	No POET (one has since been installed, but no effluent data are yet available).	490	3.7	16	180	2.0 U	2.0 U	692
29 Mountain Rd	01/08/20	No POET	59	2.0 U	5.3	53	2.0 U	2.0 U	120
	03/11/20	Post-POET Influent	41	2.0 U	5.1	38	2.0 U	2.0 U	87
	05/08/20	Post-POET Influent	21	2.0 U	4.4	27	2.0 U	2.0 U	55
		Post-POET - Max Effluent/ Duplicate	16	2.0 U	3.5	21	2.0 U	2.0 U	44 [2]
	06/30/20	Post-POET Influent	25	2.0 U	4.7	21	2.0 U	2.0 U	54
		Post-POET Effluent	23	2.0 U	4.5	22	2.0 U	2.0 U	53 [2]
07/29/20	Post-POET Influent	30	2.0 U	3.8	22	2.0 U	2.0 U	59	
30 Mountain Rd	01/27/20	No POET	4.4	2.0 U	6.1	5.4	2.0 U	2.0 U	19
	06/05/20	No POET	3.9	2.0 U	4.6	4.1	2.0 U	2.0 U	16
38 Mountain Rd	02/14/20	No POET	2.0 U	2.0 U	2.0 U	2.2	2.0 U	2.0 U	7.2
	07/21/20	No POET	2.0 U	2.0 U	3.0	2.4	2.0 U	2.0 U	9.4
51 Mountain Rd	02/12/20	No POET	4.0 U	9.5	29	24	4.0 U	4.0 U	69
	05/28/20	Post-POET Influent	2.0 U	9.4	29	23	3.0	2.0 U	66
		Post-POET Effluent	2.0 U	2.0 U	2.0 U	2.9	2.0 U	2.0 U	7.9 [2]
	06/23/20	Post-POET Influent	2.0 U	9.0	28	21	2.6	2.0 U	63
07/31/20	Post-POET Influent	2.0 U	11	30	24	3.2	2.0 U	70	
54 Mountain Rd	02/26/20	No POET	4.0 U	7.6	20	18	4.0 U	4.0 U	52
	06/22/20	Post-POET Influent	2.0 U	7.9	24	24	2.5	2.0 U	60
	08/05/20	Post-POET Influent	2.0 U	6.7	23	22	2.2	2.0 U	56
58 Mountain Rd	02/26/20	No POET	4.0 U	29	89	210	20	6.2	356
	07/14/20	Post-POET Influent	2.0 U	31	95	230	20	6.9	384
	07/31/20	Post-POET Influent	2.0 U	6.0	18	35	3.5	2.0 U	65
64 Mountain Rd	01/30/20	No POET	2.0 U	19	34	22	2.0 U	2.0 U	78
	03/03/20	Post-POET Influent	2.0 U	23	44	20	2.5	2.0 U	92
	05/08/20	Post-POET Influent	2.0 U	18	34	15	2.2	2.0 U	71
	06/18/20	Post-POET Influent	2.0 U	22	43	20	2.3	2.0 U	89
	07/29/20	Post-POET Influent	2.0 U	2.6	5.3	2.4	2.0 U	2.0 U	13
5 Prospect St	01/13/20	No POET	32	2.0 U	2.0 U	6.2	2.0 U	2.0 U	42
	01/24/20	Post-POET Influent	6.6	2.0 U	2.0 U	3.0	2.0 U	2.0 U	14
	01/31/20	Post-POET Influent	2.5	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	7.5
	02/07/20	Post-POET Influent	2.4	2.0 U	2.0 U	2.0 U	2.0 U	2.0 U	7.4
	06/18/20	Post-POET Influent	7	2.0 U	2.0 U	2.8	2.0 U	2.0 U	14
7 Prospect St	12/09/19	No POET	8.8	2.0 U	2.0 U	4.5	2.0 U	2.0 U	17
	06/05/20	No POET	11	2.0 U	2.0 U	6.0	2.0 U	2.0 U	21
11 Prospect St	01/08/20	No POET	2.1	2.0 U	2.0 U	2.3	2.0 U	2.0 U	8.4
	02/20/20	Post-POET Influent	3.3	2.0 U	2.0 U	2.5	2.0 U	2.0 U	10
17 Prospect St	01/08/20	No POET	2.0 U	2.0 U	2.0 U	2.8	2.0 U	2.0 U	7.8
7 Radford Rd	02/28/20	No POET	2.0 U	2.0 U	2.0 U	2.3	2.0 U	2.0 U	7.3
	07/21/20	No POET	2.0 U	2.0 U	2.0 U	3.2	2.7	2.0 U	10
8 Radford Rd	02/28/20	No POET	2.0 U	2.0 U	3.9	2.5	2.0 U	2.0 U	10
	07/21/20	No POET	2.0 U	2.0 U	4.1	3.1	2.0 U	2.0 U	11
11 Radford Rd	02/14/20	No POET	2.0 U	2.0 U	2.7	2.3	2.0 U	2.0 U	9.0
	07/22/20	No POET	2.0 U	2.0 U	3.1	3.1	2.0 U	2.0 U	10
12 Radford Rd	05/01/20	No POET	2.0 U	3.2	11	8.3	2.0 U	2.0 U	26
	06/30/20	Post-POET Influent	2.0 U	3.2	9.8	7.5	2.0 U	2.0 U	24
	07/31/20	Post-POET Influent	2.0 U	3.3	11	8.9	2.0 U	2.0 U	26

TABLE 2
Summary of Residential Well Analytical Data - PFAS-6
 Princeton, Massachusetts

Address	Sampling Date	Status of Treatment	Perfluorohexane-sulfonic acid (PFHxS)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorooctane-sulfonic acid (PFOS)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Total Regulated PFAS-6
			ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L
23 Radford Rd	07/22/20	No POET	2.8	2.0 U	6.5	5.5	2.0 U	2.0 U	18
28 Radford Rd	01/30/20	No POET	2.7	2.0 U	5.4	7.0	2.0 U	2.0 U	18
	07/21/20	No POET	2.0 U	2.0 U	4.6	4.0	2.0 U	2.0 U	13
29 Radford Rd	03/17/20	No POET	2.0 U	2.0 U	3.2	3.5	2.0 U	2.0 U	11
	07/21/20	No POET	2.0 U	2.0 U	2.4	2.8	2.0 U	2.0 U	9.2
37 Radford Rd	04/28/20	No POET	2.0 U	2.0 U	2.0 U	2.1	2.0 U	2.0 U	7.1
1 Worcester Rd	06/11/20	No POET	2.0 U	2.0 U	2.5	2.0 U	2.0 U	2.0 U	7.5
10 Worcester Rd	01/09/20	No POET	2.0 U	8.0	3.6	2.3	2.7	2.0 U	18.6
	06/11/20	No POET	2.0 U	2.0 U	3.0	2.0 U	2.0 U	2.0 U	8.0
15 Worcester Rd	03/06/20	No POET	2.0 U	2.0 U	3.1	2.0 U	2.0 U	2.0 U	8.1
	07/21/20	No POET	2.0 U	2.0 U	3.1	2.0 U	2.0 U	2.0 U	8.1
16 Worcester Rd	02/05/20	No POET	2.0 U	2.0 U	2.2	2.0 U	2.0 U	2.0 U	7.2
	07/29/20	No POET	2.0 U	2.0 U	2.6	2.0 U	2.0 U	2.0 U	7.6
Maximum Detected Concentration ^[1]			490	31	95	230	20	6.9	692
90th Percentile Concentration ^[1]									115
50th Percentile Concentration ^[1]									28
Massachusetts MMCL ^[2]			-	-	-	-	-	-	20
Imminent Hazard Maximum Level (assuming HI of 1 is benchmark)									100

Only detections of regulated PFAS-6 are shown, events and locations with no detections are not shown.

Value Exceeds Imminent Hazard Maximum Level

Value Exceeds Imminent Hazard Maximum Level in influent only. POET is in operation and effluent (treated water) has no detected PFAS-6 compounds.

All units are nanograms per liter (ng/L) (same as parts-per trillion [ppt]).

POET A point-of-entry treatment system is present in this location.

U Not detected at reporting limit shown.

UB Not detected; detected in field blank.

J Estimated concentration.

[1]. For total regulated PFAS-6 concentrations, non-detections were included at one-half reporting limit.

[2]. Detections attributed to sampling error (either incorrect port sampled or the system was inadvertently set to by-pass).

Excluded

Address	Sampling Date	Status of Treatment	Perfluorohexane-sulfonic acid (PFHxS)	Perfluoroheptanoic acid (PFHpA)	Perfluorooctanoic acid (PFOA)	Perfluorooctane-sulfonic acid (PFOS)	Perfluorononanoic acid (PFNA)	Perfluorodecanoic acid (PFDA)	Total Regulated PFAS-6
			ng/L	ng/L	ng/L	ng/L	ng/L	ng/L	ng/L
Mountain Rd Runoff	02/27/20	--	710	23	100	2,800	3.1	6.2	3,642

APPENDIX A

Imminent Hazard Calculations

Imminent Hazard Calculations
6 Town Hall Drive, Princeton, Massachusetts

Main equation

$$ADD = \frac{C_{\text{water}} \times CF1 \times RA_{\text{Fo}} \times RSC \times IR_{\text{water}} \times EF \times EP \times CF2}{BW \times AP}$$

$$HI = ADD/RfD$$

where:

- ADD = Average daily dose of PFAS-6 from exposure (mg/kg-dy)
- C_{water} = PFAS-6 concentration in water (ng/L)
- CF1 = Unit conversion factor (mg/ng)
- RA_{Fo} = Relative absorption factor, oral (unitless)
- RSC = Relative source contribution (unitless)
- IR_{water} = Water ingestion rate (L/day)
- EF = Exposure frequency (days/year)
- EP = Exposure period (years)
- CF2 = Unit conversion factor (yr/day)
- BW = Body Weight (kg)
- AP = Averaging period (yr)
- RfD = Oral non-carcinogenic reference dose (mg/kg-dy).
- HI = Non-carcinogenic Hazard Index (unitless)

Imminent Hazard Calculation
by MMCL approach for GW-1 standard (lactating woman)

Constituent	Scenario	C _{water} ng/L (ppt)	CF1 mg/ng	RA _{Fo} unitless	RSC unitless	IR _{water} L/day	EF day/year	EP yr	CF2 (yr/day)	BW kg	AP yr	ADD mg/kg-dy	RfD mg/kg-dy	HI unitless
PFAS-6	Stated IHE level of 100 ppt	100	1.00E-06	1	1	3.2	365	5	2.74E-03	60	5	5.33E-06	5.00E-06	1.1
	Maximum - Town Hall Well	234	1.00E-06	1	1	3.2	365	5	2.74E-03	60	5	1.25E-05	5.00E-06	2.5
	Maximum - Residential	692	1.00E-06	1	1	3.2	365	5	2.74E-03	60	5	3.69E-05	5.00E-06	7.4
	90th Percentile	115	1.00E-06	1	1	3.2	365	5	2.74E-03	60	5	6.13E-06	5.00E-06	1.2
	50th Percentile	20	1.00E-06	1	1	3.2	365	5	2.74E-03	60	5	1.07E-06	5.00E-06	0.2
	Standard; RSC = 1	20	1.00E-06	1	1	3.2	365	5	2.74E-03	60	5	1.07E-06	5.00E-06	0.2
Standard; RSC = 0.2	20	1.00E-06	1	0.2	3.2	365	5	2.74E-03	60	5	2.13E-07	5.00E-06	1.0	

Reverse Calculation of Maximum Concentration to Cause Imminent Hazard.

Constituent	Target HI unitless	BW kg	AP yr	RfD mg/kg-dy	CF mg/ng	RA _{Fo} unitless	RSC unitless	IR _{water} L/day	EF days/year	EP yr	CF (yr/day)	Max C _{water} PFAS-6 ng/L (ppt)
PFAS-6	10	60	5	5.00E-06	1.00E-06	1	1	3.2	365	5	2.74E-03	938
	1	60	5	5.00E-06	1.00E-06	1	1	3.2	365	5	2.74E-03	94

Tighe&Bond

APPENDIX E

July 13, 2020

Jeff Arps
Tighe & Bond, Inc. - Worcester
120 Front St.
Worcester, MA 01608-2303

Project Location: Princeton, MA
Client Job Number:
Project Number: P-0534
Laboratory Work Order Number: 20F1324

Enclosed are results of analyses for samples received by the laboratory on June 26, 2020. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Jessica L. Hoffman
Project Manager

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Tighe & Bond, Inc. - Worcester
120 Front St.
Worcester, MA 01608-2303
ATTN: Jeff Arps

REPORT DATE: 7/13/2020

PURCHASE ORDER NUMBER:

PROJECT NUMBER: P-0534

ANALYTICAL SUMMARY

WORK ORDER NUMBER: 20F1324

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Princeton, MA

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
MW-6	20F1324-01	Ground Water		EPA 537.1	
Field Blank	20F1324-02	Field Blank		EPA 537.1	
Equipment Blank	20F1324-03	Equipment Blank Water		EPA 537.1	
TB-06232020	20F1324-04	Trip Blank Water		EPA 537.1	

CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.

I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

A handwritten signature in black ink, appearing to read "Lisa A. Worthington", is written over a light gray rectangular background.

Lisa A. Worthington
Technical Representative

39 Spruce Street * East Longmeadow, MA 01028 * FAX 413/525-6405 * TEL. 413/525-2332

Project Location: Princeton, MA

Sample Description:

Work Order: 20F1324

Date Received: 6/26/2020

Field Sample #: MW-6

Sampled: 6/23/2020 12:30

Sample ID: 20F1324-01

Sample Matrix: Ground Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanesulfonic acid (PFBS)	4.6	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 12:17	JFC
Perfluorohexanoic acid (PFHxA)	11	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 12:17	JFC
Perfluorohexanesulfonic acid (PFHxS)	9.9	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 12:17	JFC
Perfluoroheptanoic acid (PFHpA)	3.2	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 12:17	JFC
Perfluorooctanoic acid (PFOA)	15	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 12:17	JFC
Perfluorooctanesulfonic acid (PFOS)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 12:17	JFC
Perfluorononanoic acid (PFNA)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 12:17	JFC
Perfluorodecanoic acid (PFDA)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 12:17	JFC
N-EtFOSAA	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 12:17	JFC
Perfluoroundecanoic acid (PFUnA)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 12:17	JFC
N-MeFOSAA	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 12:17	JFC
Perfluorododecanoic acid (PFDoA)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 12:17	JFC
Perfluorotridecanoic acid (PFTrDA)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 12:17	JFC
Perfluorotetradecanoic acid (PFTA)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 12:17	JFC
Hexafluoropropylene oxide dimer acid (HFPO-DA)	3.8	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 12:17	JFC
11Cl-PF3OUdS (F53B Major)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 12:17	JFC
9Cl-PF3ONS (F53B Minor)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 12:17	JFC
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 12:17	JFC

Surrogates	% Recovery	Recovery Limits	Flag/Qual
13C-PFHxA	81.8	70-130	7/13/20 12:17
M3HFPO-DA	74.5	70-130	7/13/20 12:17
13C-PFDA	93.6	70-130	7/13/20 12:17
d5-NEtFOSAA	93.2	70-130	7/13/20 12:17

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Project Location: Princeton, MA

Sample Description:

Work Order: 20F1324

Date Received: 6/26/2020

Field Sample #: Field Blank

Sampled: 6/23/2020 12:30

Sample ID: 20F1324-02

Sample Matrix: Field Blank

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanesulfonic acid (PFBS)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 12:39	JFC
Perfluorohexanoic acid (PFHxA)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 12:39	JFC
Perfluorohexanesulfonic acid (PFHxS)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 12:39	JFC
Perfluoroheptanoic acid (PFHpA)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 12:39	JFC
Perfluorooctanoic acid (PFOA)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 12:39	JFC
Perfluorooctanesulfonic acid (PFOS)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 12:39	JFC
Perfluorononanoic acid (PFNA)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 12:39	JFC
Perfluorodecanoic acid (PFDA)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 12:39	JFC
N-EtFOSAA	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 12:39	JFC
Perfluoroundecanoic acid (PFUnA)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 12:39	JFC
N-MeFOSAA	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 12:39	JFC
Perfluorododecanoic acid (PFDoA)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 12:39	JFC
Perfluorotridecanoic acid (PFTrDA)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 12:39	JFC
Perfluorotetradecanoic acid (PFTA)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 12:39	JFC
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 12:39	JFC
11Cl-PF3OUdS (F53B Major)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 12:39	JFC
9Cl-PF3ONS (F53B Minor)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 12:39	JFC
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 12:39	JFC

Surrogates	% Recovery	Recovery Limits	Flag/Qual
13C-PFHxA	92.7	70-130	7/13/20 12:39
M3HFPO-DA	92.4	70-130	7/13/20 12:39
13C-PFDA	93.4	70-130	7/13/20 12:39
d5-NEtFOSAA	94.5	70-130	7/13/20 12:39

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Project Location: Princeton, MA

Sample Description:

Work Order: 20F1324

Date Received: 6/26/2020

Field Sample #: Equipment Blank

Sampled: 6/23/2020 12:30

Sample ID: 20F1324-03

Sample Matrix: Equipment Blank Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanesulfonic acid (PFBS)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 13:00	JFC
Perfluorohexanoic acid (PFHxA)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 13:00	JFC
Perfluorohexanesulfonic acid (PFHxS)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 13:00	JFC
Perfluoroheptanoic acid (PFHpA)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 13:00	JFC
Perfluorooctanoic acid (PFOA)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 13:00	JFC
Perfluorooctanesulfonic acid (PFOS)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 13:00	JFC
Perfluorononanoic acid (PFNA)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 13:00	JFC
Perfluorodecanoic acid (PFDA)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 13:00	JFC
N-EtFOSAA	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 13:00	JFC
Perfluoroundecanoic acid (PFUnA)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 13:00	JFC
N-MeFOSAA	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 13:00	JFC
Perfluorododecanoic acid (PFDoA)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 13:00	JFC
Perfluorotridecanoic acid (PFTrDA)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 13:00	JFC
Perfluorotetradecanoic acid (PFTA)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 13:00	JFC
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 13:00	JFC
11Cl-PF3OUdS (F53B Major)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 13:00	JFC
9Cl-PF3ONS (F53B Minor)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 13:00	JFC
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 13:00	JFC

Surrogates	% Recovery	Recovery Limits	Flag/Qual
13C-PFHxA	92.6	70-130	7/13/20 13:00
M3HFPO-DA	90.5	70-130	7/13/20 13:00
13C-PFDA	92.6	70-130	7/13/20 13:00
d5-NEtFOSAA	90.4	70-130	7/13/20 13:00

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Project Location: Princeton, MA

Sample Description:

Work Order: 20F1324

Date Received: 6/26/2020

Field Sample #: TB-06232020

Sampled: 6/23/2020 12:30

Sample ID: 20F1324-04

Sample Matrix: Trip Blank Water

Semivolatile Organic Compounds by - LC/MS-MS

Analyte	Results	RL	Units	Dilution	Flag/Qual	Method	Date Prepared	Date/Time Analyzed	Analyst
Perfluorobutanesulfonic acid (PFBS)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 13:22	JFC
Perfluorohexanoic acid (PFHxA)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 13:22	JFC
Perfluorohexanesulfonic acid (PFHxS)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 13:22	JFC
Perfluoroheptanoic acid (PFHpA)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 13:22	JFC
Perfluorooctanoic acid (PFOA)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 13:22	JFC
Perfluorooctanesulfonic acid (PFOS)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 13:22	JFC
Perfluorononanoic acid (PFNA)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 13:22	JFC
Perfluorodecanoic acid (PFDA)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 13:22	JFC
N-EtFOSAA	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 13:22	JFC
Perfluoroundecanoic acid (PFUnA)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 13:22	JFC
N-MeFOSAA	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 13:22	JFC
Perfluorododecanoic acid (PFDoA)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 13:22	JFC
Perfluorotridecanoic acid (PFTrDA)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 13:22	JFC
Perfluorotetradecanoic acid (PFTA)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 13:22	JFC
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 13:22	JFC
11Cl-PF3OUdS (F53B Major)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 13:22	JFC
9Cl-PF3ONS (F53B Minor)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 13:22	JFC
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	ND	2.0	ng/L	1		EPA 537.1	7/7/20	7/13/20 13:22	JFC

Surrogates	% Recovery	Recovery Limits	Flag/Qual
13C-PFHxA	91.6	70-130	7/13/20 13:22
M3HFPO-DA	90.5	70-130	7/13/20 13:22
13C-PFDA	92.1	70-130	7/13/20 13:22
d5-NEtFOSAA	95.5	70-130	7/13/20 13:22

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Sample Extraction Data

Prep Method: EPA 537.1 Analytical Method: EPA 537.1

Lab Number [Field ID]	Batch	Initial [mL]	Final [mL]	Date
20F1324-01 [MW-6]	B261403	250	1.00	07/07/20
20F1324-02 [Field Blank]	B261403	250	1.00	07/07/20
20F1324-03 [Equipment Blank]	B261403	250	1.00	07/07/20
20F1324-04 [TB-06232020]	B261403	250	1.00	07/07/20

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QUALITY CONTROL

Semivolatile Organic Compounds by - LC/MS-MS - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch B261403 - EPA 537.1										
Blank (B261403-BLK1)										
Prepared: 07/07/20 Analyzed: 07/13/20										
Perfluorobutanesulfonic acid (PFBS)	ND	2.0	ng/L							
Perfluorohexanoic acid (PFHxA)	ND	2.0	ng/L							
Perfluorohexanesulfonic acid (PFHxS)	ND	2.0	ng/L							
Perfluoroheptanoic acid (PFHpA)	ND	2.0	ng/L							
Perfluorooctanoic acid (PFOA)	ND	2.0	ng/L							
Perfluorooctanesulfonic acid (PFOS)	ND	2.0	ng/L							
Perfluorononanoic acid (PFNA)	ND	2.0	ng/L							
Perfluorodecanoic acid (PFDA)	ND	2.0	ng/L							
N-EtFOSAA	ND	2.0	ng/L							
Perfluoroundecanoic acid (PFUnA)	ND	2.0	ng/L							
N-MeFOSAA	ND	2.0	ng/L							
Perfluorododecanoic acid (PFDoA)	ND	2.0	ng/L							
Perfluorotridecanoic acid (PFTrDA)	ND	2.0	ng/L							
Perfluorotetradecanoic acid (PFTA)	ND	2.0	ng/L							
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND	2.0	ng/L							
11Cl-PF3OUdS (F53B Major)	ND	2.0	ng/L							
9Cl-PF3ONS (F53B Minor)	ND	2.0	ng/L							
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	ND	2.0	ng/L							
Surrogate: 13C-PFHxA	36.8		ng/L	40.0		92.0	70-130			
Surrogate: M3HFPO-DA	37.3		ng/L	40.0		93.3	70-130			
Surrogate: 13C-PFDA	37.5		ng/L	40.0		93.9	70-130			
Surrogate: d5-NEtFOSAA	152		ng/L	160		95.2	70-130			
LCS (B261403-BS1)										
Prepared: 07/07/20 Analyzed: 07/13/20										
Perfluorobutanesulfonic acid (PFBS)	8.15	2.0	ng/L	8.85		92.1	70-130			
Perfluorohexanoic acid (PFHxA)	9.96	2.0	ng/L	10.0		99.6	70-130			
Perfluorohexanesulfonic acid (PFHxS)	8.03	2.0	ng/L	9.10		88.2	70-130			
Perfluoroheptanoic acid (PFHpA)	9.34	2.0	ng/L	10.0		93.4	70-130			
Perfluorooctanoic acid (PFOA)	9.63	2.0	ng/L	10.0		96.3	70-130			
Perfluorooctanesulfonic acid (PFOS)	8.53	2.0	ng/L	9.25		92.2	70-130			
Perfluorononanoic acid (PFNA)	9.48	2.0	ng/L	10.0		94.8	70-130			
Perfluorodecanoic acid (PFDA)	9.02	2.0	ng/L	10.0		90.2	70-130			
N-EtFOSAA	10.4	2.0	ng/L	10.0		104	70-130			
Perfluoroundecanoic acid (PFUnA)	9.15	2.0	ng/L	10.0		91.5	70-130			
N-MeFOSAA	10.6	2.0	ng/L	10.0		106	70-130			
Perfluorododecanoic acid (PFDoA)	8.96	2.0	ng/L	10.0		89.6	70-130			
Perfluorotridecanoic acid (PFTrDA)	9.54	2.0	ng/L	10.0		95.4	70-130			
Perfluorotetradecanoic acid (PFTA)	9.29	2.0	ng/L	10.0		92.9	70-130			
Hexafluoropropylene oxide dimer acid (HFPO-DA)	7.25	2.0	ng/L	10.0		72.5	70-130			
11Cl-PF3OUdS (F53B Major)	7.08	2.0	ng/L	9.40		75.4	70-130			
9Cl-PF3ONS (F53B Minor)	7.52	2.0	ng/L	9.30		80.9	70-130			
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	8.12	2.0	ng/L	10.0		81.2	70-130			
Surrogate: 13C-PFHxA	38.5		ng/L	40.0		96.1	70-130			
Surrogate: M3HFPO-DA	38.1		ng/L	40.0		95.2	70-130			
Surrogate: 13C-PFDA	39.0		ng/L	40.0		97.5	70-130			
Surrogate: d5-NEtFOSAA	162		ng/L	160		101	70-130			

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FLAG/QUALIFIER SUMMARY

*	QC result is outside of established limits.
†	Wide recovery limits established for difficult compound.
‡	Wide RPD limits established for difficult compound.
#	Data exceeded client recommended or regulatory level
ND	Not Detected
RL	Reporting Limit is at the level of quantitation (LOQ)
DL	Detection Limit is the lower limit of detection determined by the MDL study
MCL	Maximum Contaminant Level

Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the calculation which have not been rounded.

No results have been blank subtracted unless specified in the case narrative section.

CERTIFICATIONS

Certified Analyses included in this Report

Analyte	Certifications
<i>EPA 537.1 in Drinking Water</i>	
Perfluorobutanesulfonic acid (PFBS)	NH-P,VT-DW,NJ,CT,ME,PA
Perfluorohexanoic acid (PFHxA)	NH-P,VT-DW,NJ,CT,ME,PA
Perfluorohexanesulfonic acid (PFHxS)	NH-P,VT-DW,NJ,CT,ME,PA
Perfluoroheptanoic acid (PFHpA)	NH-P,VT-DW,NJ,CT,ME,PA
Perfluorooctanoic acid (PFOA)	VT-DW,NJ,CT,ME,NY,NH,PA
Perfluorooctanesulfonic acid (PFOS)	VT-DW,NJ,CT,ME,NY,NH,PA
Perfluorononanoic acid (PFNA)	NH-P,VT-DW,NJ,CT,ME,PA
Perfluorodecanoic acid (PFDA)	NH-P,VT-DW,NJ,CT,ME,PA
N-EtFOSAA	NH-P,VT-DW,NJ,CT,ME,PA
Perfluoroundecanoic acid (PFUnA)	NH-P,VT-DW,NJ,CT,ME,PA
N-MeFOSAA	NH-P,VT-DW,NJ,CT,ME,PA
Perfluorododecanoic acid (PFDoA)	NH-P,VT-DW,NJ,CT,ME,PA
Perfluorotridecanoic acid (PFTrDA)	NH-P,VT-DW,NJ,CT,ME,PA
Perfluorotetradecanoic acid (PFTA)	NH-P,VT-DW,NJ,CT,ME,PA
Hexafluoropropylene oxide dimer acid (HFPO-DA)	NH-P,VT-DW,NJ,CT,ME,PA
11Cl-PF3OUdS (F53B Major)	NH-P,VT-DW,NJ,CT,ME,PA
9Cl-PF3ONS (F53B Minor)	NH-P,VT-DW,NJ,CT,ME,PA
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	NH-P,VT-DW,NJ,CT,ME,PA

The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC - ISO17025:2017	100033	03/1/2022
MA	Massachusetts DEP	M-MA100	06/30/2021
CT	Connecticut Department of Public Health	PH-0567	09/30/2021
NY	New York State Department of Health	10899 NELAP	04/1/2021
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2021
RI	Rhode Island Department of Health	LAO00112	12/30/2020
NC	North Carolina Div. of Water Quality	652	12/31/2020
NJ	New Jersey DEP	MA007 NELAP	06/30/2021
FL	Florida Department of Health	E871027 NELAP	06/30/2021
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2021
ME	State of Maine	2011028	06/9/2021
VA	Commonwealth of Virginia	460217	12/14/2020
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2020
VT-DW	Vermont Department of Health Drinking Water	VT-255716	06/12/2021
NC-DW	North Carolina Department of Health	25703	07/31/2020
PA	Commonwealth of Pennsylvania DEP	68-05812	06/30/2021



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http://www.contestlabs.com

CHAIN OF CUSTODY RECORD

39 Spruce Street
 East Longmeadow, MA 01028

Doc # 381 Rev 2_06262019

Company Name: Ticket Bond
 Address: 120 FORT ST SUITE 7
 Phone: 508-754-2224
 Project Name: PRINCETON WAI SAMPLING
 Project Location: PRINCETON, MA
 Project Number: P-0534
 Project Manager: M. SCHEER
 Con-Test Quote Name/Number:
 Invoice Recipient: Ticket Bond
 Sampled By: MS

Requested/Manufacturing Time:
 7-Day 10-Day
 PFAS 10-Day (std) Due Date:
 Rush Approval Required:
 1-Day 3-Day
 2-Day 4-Day
 Data Delivery:
 Format: PDF EXCEL
 Other:
 CLP Like Data Pkg Required:
 Email To:
 Fax To #:

ANALYSIS REQUESTED

Concentration	Field Filtered	Lab to Filter
Field Filtered	<input type="checkbox"/>	<input type="checkbox"/>
Lab to Filter	<input type="checkbox"/>	<input type="checkbox"/>
Field Filtered	<input type="checkbox"/>	<input type="checkbox"/>
Lab to Filter	<input type="checkbox"/>	<input type="checkbox"/>

Preservation Code
 Counter Use Only
 Total Number Of:
 VIALS _____
 GLASS _____
 PLASTIC _____
 BACTERIA _____
 ENCORE _____
 Glassware in the fridge? Y / N
 Glassware in freezer? Y / N
 Prepackaged Cooler? Y / N
 *Contest is not responsible for missing samples from prepacked coolers

Con-Test Work Order#	Client Sample ID / Description	Beginning Date/Time	Ending Date/Time	COMP/GRAB	Matrix Code	Conc Code	VIALS	GLASS	PLASTIC	BACTERIA	ENCORE
1	MW-6	6/23/20	1230	GRAB	GW	U			2		
2	FIELD BANK								1		
3	EQUIPMENT Blank								1		
4	TR-0623R020								1		

Relinquished by: (signature) [Signature] Date/Time: 6/23/20 1800
 Received by: (signature) [Signature] Date/Time: 6/26/20 1330
 Relinquished by: (signature) [Signature] Date/Time: 6/26/20 1400
 Received by: (signature) [Signature] Date/Time: 6/26/20 1450
 Relinquished by: (signature) [Signature] Date/Time: 6/26/20 1450
 Received by: (signature) [Signature] Date/Time: _____
 Relinquished by: (signature) [Signature] Date/Time: _____
 Received by: (signature) [Signature] Date/Time: _____

Client Comments:
 Detection Limit Requirements:
 Special Requirements:
 MA MCP Required
 MCP Certification Form Required
 CT RCP Required
 RCP Certification Form Required
 MA State DW Required
 PWSID # _____
 Project Entity:
 Government Municipality MWRA WRTA
 Federal 21 J School
 City Brownfield MBTA

Please use the following codes to indicate possible sample concentration within the Conc Code column above:
 H - High; M - Medium; L - Low; C - Clean; U - Unknown
 NELAC and AIHA-LAP, LLC Accredited

- 1 Matrix Codes:**
 GW = Ground Water
 WW = Waste Water
 DW = Drinking Water
 A = Air
 S = Soil
 SL = Sludge
 SOL = Solid
 O = Other (please define)
- 2 Preservation Codes:**
 I = iced
 H = HCL
 M = Methanol
 N = Nitric Acid
 S = Sulfuric Acid
 B = Sodium Bisulfate
 X = Sodium Hydroxide
 T = Sodium Thiosulfate
 O = Other (please define)
- PCB ONLY**
 Soxhlet
 Non Soxhlet

Comments:
Per Steve Beek, run samples for 37.1 as per previous WO 10A0105 - MEK 7/1/2020

Disclaimer: Con-Test Labs is not responsible for any omitted information on the Chain of Custody. The Chain of Custody is a legal document that must be complete and accurate and is used to determine what analyses the laboratory will perform. Any missing information is not the laboratory's responsibility. Con-Test values your partnership on each project and will try to assist with missing information, but will not be held accountable.

I Have Not Confirmed Sample Container Numbers With Lab Staff Before Relinquishing Over Samples _____



con-test
ANALYTICAL LABORATORY

Doc# 277 Rev 5 2017

Login Sample Receipt Checklist - (Rejection Criteria Listing - Using Acceptance Policy) Any False Statement will be brought to the attention of the Client - State True or False

Client Tighe + Bond
 Received By [Signature] Date 6/20/20 Time 1450
 How were the samples received? In Cooler T No Cooler _____ On Ice T No Ice _____
 Direct from Sampling _____ Ambient _____ Melted Ice _____
 Were samples within Temperature? 2-6°C T By Gun # 2 Actual Temp - 3.8
 By Blank # _____ Actual Temp - _____
 Was Custody Seal Intact? T Was Samples Tampered with? n/a
 Was COC Relinquished? T Does Chain Agree With Samples? T
 Are there broken/leaking/loose caps on any samples? F
 Is COC in ink/ Legible? T Were samples received within holding time? T
 Did COC include all pertinent Information? Client T Project T Analysis T Sampler Name T
 ID's T Collection Dates/Times T
 Are Sample labels filled out and legible? T
 Are there Lab to Filters? F Who was notified? _____
 Are there Rushes? F Who was notified? _____
 Are there Short Holds? F Who was notified? _____
 Is there enough Volume? T
 Is there Headspace where applicable? n/a MS/MSD? F
 Proper Media/Containers Used? T Is splitting samples required? F
 Were trip blanks received? T On COC? T
 Do all samples have the proper pH? _____ Acid n/a Base n/a

Vials	#	Containers:	#	#	#
Unp-		1 Liter Amb.		1 Liter Plastic	16 oz Amb.
HCL-		500 mL Amb.		500 mL Plastic	8oz Amb/Clear
Meoh-		250 mL Amb.		250 mL Plastic	4oz Amb/Clear
Bisulfate-		Flashpoint		Col./Bacteria	2oz Amb/Clear
DI-		Other Glass		Other Plastic	Encore
Thiosulfate-		SOC Kit		Plastic Bag	Frozen:
Sulfuric-		Perchlorate		Ziplock	

Unused Media

Vials	#	Containers:	#	#	#
Unp-		1 Liter Amb.		1 Liter Plastic	16 oz Amb.
HCL-		500 mL Amb.		500 mL Plastic	8oz Amb/Clear
Meoh-		250 mL Amb.		250 mL Plastic	4oz Amb/Clear
Bisulfate-		Col./Bacteria		Flashpoint	2oz Amb/Clear
DI-		Other Plastic		Other Glass	Encore
Thiosulfate-		SOC Kit		Plastic Bag	Frozen:
Sulfuric-		Perchlorate		Ziplock	

Comments:



ANALYTICAL REPORT

Lab Number:	L2026828
Client:	White Water Inc. 253B Worcester Road Charlton, MA 01507
ATTN:	Andrew Donnelly
Phone:	(888) 377-7678
Project Name:	PRINCETON TOWN CAMPUS
Project Number:	Not Specified
Report Date:	07/06/20

The original project report/data package is held by Alpha Analytical. This report/data package is paginated and should be reproduced only in its entirety. Alpha Analytical holds no responsibility for results and/or data that are not consistent with the original.

Certifications & Approvals: MA (M-MA030), NH NELAP (2062), CT (PH-0141), DoD (L2474), FL (E87814), IL (200081), LA (85084), ME (MA00030), MD (350), NJ (MA015), NY (11627), NC (685), OH (CL106), PA (68-02089), RI (LAO00299), TX (T104704419), VT (VT-0015), VA (460194), WA (C954), US Army Corps of Engineers, USDA (Permit #P330-17-00150), USFWS (Permit #206964).

320 Forbes Boulevard, Mansfield, MA 02048-1806
508-822-9300 (Fax) 508-822-3288 800-624-9220 - www.alphalab.com



Project Name: PRINCETON TOWN CAMPUS
Project Number: Not Specified

Lab Number: L2026828
Report Date: 07/06/20

Alpha Sample ID	Client ID	Matrix	Sample Location	Collection Date/Time	Receive Date
L2026828-01	FINISH-TC001G WELL 1	DW	PRINCETON BAGG HALL	06/23/20 12:30	06/25/20
L2026828-02	FB	DW	PRINCETON BAGG HALL	06/23/20 12:30	06/25/20

Project Name: PRINCETON TOWN CAMPUS**Lab Number:** L2026828**Project Number:** Not Specified**Report Date:** 07/06/20

Case Narrative

The samples were received in accordance with the Chain of Custody and no significant deviations were encountered during the preparation or analysis unless otherwise noted. Sample Receipt, Container Information, and the Chain of Custody are located at the back of the report.

Results contained within this report relate only to the samples submitted under this Alpha Lab Number and meet NELAP requirements for all NELAP accredited parameters unless otherwise noted in the following narrative. The data presented in this report is organized by parameter (i.e. VOC, SVOC, etc.). Sample specific Quality Control data (i.e. Surrogate Spike Recovery) is reported at the end of the target analyte list for each individual sample, followed by the Laboratory Batch Quality Control at the end of each parameter. Tentatively Identified Compounds (TICs), if requested, are reported for compounds identified to be present and are not part of the method/program Target Compound List, even if only a subset of the TCL are being reported. If a sample was re-analyzed or re-extracted due to a required quality control corrective action and if both sets of data are reported, the Laboratory ID of the re-analysis or re-extraction is designated with an "R" or "RE", respectively.

When multiple Batch Quality Control elements are reported (e.g. more than one LCS), the associated samples for each element are noted in the grey shaded header line of each data table. Any Laboratory Batch, Sample Specific % recovery or RPD value that is outside the listed Acceptance Criteria is bolded in the report. In reference to questions H (CAM) or 4 (RCP) when "NO" is checked, the performance criteria for CAM and RCP methods allow for some quality control failures to occur and still be within method compliance. In these instances, the specific failure is not narrated but noted in the associated QC Outlier Summary Report, located directly after the Case Narrative. QC information is also incorporated in the Data Usability Assessment table (Format 11) of our Data Merger tool, where it can be reviewed in conjunction with the sample result, associated regulatory criteria and any associated data usability implications.

Soil/sediments, solids and tissues are reported on a dry weight basis unless otherwise noted. Definitions of all data qualifiers and acronyms used in this report are provided in the Glossary located at the back of the report.

HOLD POLICY - For samples submitted on hold, Alpha's policy is to hold samples (with the exception of Air canisters) free of charge for 21 calendar days from the date the project is completed. After 21 calendar days, we will dispose of all samples submitted including those put on hold unless you have contacted your Alpha Project Manager and made arrangements for Alpha to continue to hold the samples. Air canisters will be disposed after 3 business days from the date the project is completed.

Please contact Project Management at 800-624-9220 with any questions.

Project Name: PRINCETON TOWN CAMPUS
Project Number: Not Specified

Lab Number: L2026828
Report Date: 07/06/20

Case Narrative (continued)

Report Submission

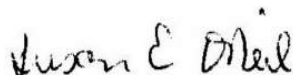
All non-detect (ND) or estimated concentrations (J-qualified) have been quantitated to the limit noted in the MDL column.

Sample Receipt

L2026828-02: A sample identified as "FB" was received, but not listed on the Chain of Custody. At the client's request, this sample was analyzed.

I, the undersigned, attest under the pains and penalties of perjury that, to the best of my knowledge and belief and based upon my personal inquiry of those responsible for providing the information contained in this analytical report, such information is accurate and complete. This certificate of analysis is not complete unless this page accompanies any and all pages of this report.

Authorized Signature:



Susan O'Neil

Title: Technical Director/Representative

Date: 07/06/20

ORGANICS

SEMIVOLATILES

Project Name: PRINCETON TOWN CAMPUS
Project Number: Not Specified

Lab Number: L2026828
Report Date: 07/06/20

SAMPLE RESULTS

Lab ID: L2026828-01
 Client ID: FINISH-TC001G WELL 1
 Sample Location: PRINCETON BAGG HALL

Date Collected: 06/23/20 12:30
 Date Received: 06/25/20
 Field Prep: Not Specified

Sample Depth:

Matrix: Dw
 Analytical Method: 122,537
 Analytical Date: 06/30/20 15:31
 Analyst: JW

Extraction Method: EPA 537
 Extraction Date: 06/29/20 06:55

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 537 - Mansfield Lab						
Perfluorobutanesulfonic Acid (PFBS)	16.1		ng/l	1.90	0.270	1
Perfluorohexanoic Acid (PFHxA)	1.48	J	ng/l	1.90	0.250	1
Perfluoroheptanoic Acid (PFHpA)	1.25	J	ng/l	1.90	0.247	1
Perfluorohexanesulfonic Acid (PFHxS)	81.7		ng/l	1.90	0.455	1
Perfluorooctanoic Acid (PFOA)	4.48		ng/l	1.90	0.592	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.90	0.452	1
Perfluorooctanesulfonic Acid (PFOS)	23.5		ng/l	1.90	0.467	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.90	0.611	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	1.90	0.888	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.90	0.774	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	1.90	0.903	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.90	0.615	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	1.90	0.482	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	1.90	0.410	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Perfluoro-n-[1,2-13C2]hexanoic Acid (13C-PFHxA)	91		70-130
Perfluoro-n-[1,2-13C2]decanoic Acid (13C-PFDA)	79		70-130
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	90		70-130

Project Name: PRINCETON TOWN CAMPUS
Project Number: Not Specified

Lab Number: L2026828
Report Date: 07/06/20

SAMPLE RESULTS

Lab ID: L2026828-02
 Client ID: FB
 Sample Location: PRINCETON BAGG HALL

Date Collected: 06/23/20 12:30
 Date Received: 06/25/20
 Field Prep: Not Specified

Sample Depth:

Matrix: Dw
 Analytical Method: 122,537
 Analytical Date: 07/02/20 16:34
 Analyst: JW

Extraction Method: EPA 537
 Extraction Date: 07/02/20 11:08

Parameter	Result	Qualifier	Units	RL	MDL	Dilution Factor
Perfluorinated Alkyl Acids by EPA 537 - Mansfield Lab						
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	1.90	0.271	1
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	1.90	0.251	1
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	1.90	0.248	1
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	1.90	0.457	1
Perfluorooctanoic Acid (PFOA)	ND		ng/l	1.90	0.595	1
Perfluorononanoic Acid (PFNA)	ND		ng/l	1.90	0.454	1
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	1.90	0.469	1
Perfluorodecanoic Acid (PFDA)	ND		ng/l	1.90	0.614	1
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	1.90	0.892	1
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	1.90	0.778	1
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	1.90	0.907	1
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	1.90	0.617	1
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	1.90	0.484	1
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	1.90	0.412	1

Surrogate	% Recovery	Qualifier	Acceptance Criteria
Perfluoro-n-[1,2-13C2]hexanoic Acid (13C-PFHxA)	88		70-130
Perfluoro-n-[1,2-13C2]decanoic Acid (13C-PFDA)	90		70-130
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	91		70-130

Project Name: PRINCETON TOWN CAMPUS
Project Number: Not Specified

Lab Number: L2026828
Report Date: 07/06/20

**Method Blank Analysis
Batch Quality Control**

Analytical Method: 122,537
Analytical Date: 06/30/20 14:48
Analyst: JW

Extraction Method: EPA 537
Extraction Date: 06/29/20 06:55

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by EPA 537 - Mansfield Lab for sample(s): 01 Batch: WG1386958-1					
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	2.00	0.284
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	2.00	0.263
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	2.00	0.260
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	2.00	0.480
Perfluorooctanoic Acid (PFOA)	ND		ng/l	2.00	0.624
Perfluorononanoic Acid (PFNA)	ND		ng/l	2.00	0.476
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	2.00	0.492
Perfluorodecanoic Acid (PFDA)	ND		ng/l	2.00	0.644
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	2.00	0.936
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	2.00	0.816
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	2.00	0.952
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	2.00	0.648
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	2.00	0.508
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	2.00	0.432

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Perfluoro-n-[1,2-13C2]hexanoic Acid (13C-PFHxA)	89		70-130
Perfluoro-n-[1,2-13C2]decanoic Acid (13C-PFDA)	92		70-130
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	101		70-130

Project Name: PRINCETON TOWN CAMPUS
Project Number: Not Specified

Lab Number: L2026828
Report Date: 07/06/20

**Method Blank Analysis
Batch Quality Control**

Analytical Method: 122,537
Analytical Date: 07/02/20 16:08
Analyst: JW

Extraction Method: EPA 537
Extraction Date: 07/02/20 11:08

Parameter	Result	Qualifier	Units	RL	MDL
Perfluorinated Alkyl Acids by EPA 537 - Mansfield Lab for sample(s): 02 Batch: WG1388424-1					
Perfluorobutanesulfonic Acid (PFBS)	ND		ng/l	2.00	0.284
Perfluorohexanoic Acid (PFHxA)	ND		ng/l	2.00	0.263
Perfluoroheptanoic Acid (PFHpA)	ND		ng/l	2.00	0.260
Perfluorohexanesulfonic Acid (PFHxS)	ND		ng/l	2.00	0.480
Perfluorooctanoic Acid (PFOA)	ND		ng/l	2.00	0.624
Perfluorononanoic Acid (PFNA)	ND		ng/l	2.00	0.476
Perfluorooctanesulfonic Acid (PFOS)	ND		ng/l	2.00	0.492
Perfluorodecanoic Acid (PFDA)	ND		ng/l	2.00	0.644
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND		ng/l	2.00	0.936
Perfluoroundecanoic Acid (PFUnA)	ND		ng/l	2.00	0.816
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND		ng/l	2.00	0.952
Perfluorododecanoic Acid (PFDoA)	ND		ng/l	2.00	0.648
Perfluorotridecanoic Acid (PFTrDA)	ND		ng/l	2.00	0.508
Perfluorotetradecanoic Acid (PFTA)	ND		ng/l	2.00	0.432

Surrogate	%Recovery	Qualifier	Acceptance Criteria
Perfluoro-n-[1,2-13C2]hexanoic Acid (13C-PFHxA)	84		70-130
Perfluoro-n-[1,2-13C2]decanoic Acid (13C-PFDA)	94		70-130
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	93		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: PRINCETON TOWN CAMPUS

Lab Number: L2026828

Project Number: Not Specified

Report Date: 07/06/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by EPA 537 - Mansfield Lab Associated sample(s): 01 Batch: WG1386958-2 WG1386958-3								
Perfluorobutanesulfonic Acid (PFBS)	111		118		70-130	6		30
Perfluorohexanoic Acid (PFHxA)	101		117		70-130	15		30
Perfluoroheptanoic Acid (PFHpA)	110		119		70-130	8		30
Perfluorohexanesulfonic Acid (PFHxS)	106		112		70-130	6		30
Perfluorooctanoic Acid (PFOA)	106		126		70-130	17		30
Perfluorononanoic Acid (PFNA)	112		121		70-130	8		30
Perfluorooctanesulfonic Acid (PFOS)	108		106		70-130	2		30
Perfluorodecanoic Acid (PFDA)	94		110		70-130	16		30
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	105		110		70-130	5		30
Perfluoroundecanoic Acid (PFUnA)	114		125		70-130	9		30
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	110		118		70-130	7		30
Perfluorododecanoic Acid (PFDoA)	116		129		70-130	11		30
Perfluorotridecanoic Acid (PFTrDA)	111		125		70-130	12		30
Perfluorotetradecanoic Acid (PFTA)	98		115		70-130	16		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Perfluoro-n-[1,2-13C2]hexanoic Acid (13C-PFHxA)	99		103		70-130
Perfluoro-n-[1,2-13C2]decanoic Acid (13C-PFDA)	101		105		70-130
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	104		103		70-130

Lab Control Sample Analysis

Batch Quality Control

Project Name: PRINCETON TOWN CAMPUS

Lab Number: L2026828

Project Number: Not Specified

Report Date: 07/06/20

Parameter	LCS %Recovery	Qual	LCSD %Recovery	Qual	%Recovery Limits	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by EPA 537 - Mansfield Lab Associated sample(s): 02 Batch: WG1388424-2 WG1388424-3								
Perfluorobutanesulfonic Acid (PFBS)	95		102		70-130	7		30
Perfluorohexanoic Acid (PFHxA)	87		95		70-130	9		30
Perfluoroheptanoic Acid (PFHpA)	96		102		70-130	6		30
Perfluorohexanesulfonic Acid (PFHxS)	92		93		70-130	1		30
Perfluorooctanoic Acid (PFOA)	96		98		70-130	2		30
Perfluorononanoic Acid (PFNA)	95		104		70-130	9		30
Perfluorooctanesulfonic Acid (PFOS)	86		95		70-130	10		30
Perfluorodecanoic Acid (PFDA)	85		87		70-130	2		30
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	89		95		70-130	7		30
Perfluoroundecanoic Acid (PFUnA)	95		100		70-130	5		30
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	95		97		70-130	2		30
Perfluorododecanoic Acid (PFDoA)	108		117		70-130	8		30
Perfluorotridecanoic Acid (PFTrDA)	98		100		70-130	2		30
Perfluorotetradecanoic Acid (PFTA)	82		84		70-130	2		30

Surrogate	LCS %Recovery	Qual	LCSD %Recovery	Qual	Acceptance Criteria
Perfluoro-n-[1,2-13C2]hexanoic Acid (13C-PFHxA)	88		91		70-130
Perfluoro-n-[1,2-13C2]decanoic Acid (13C-PFDA)	89		86		70-130
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	91		92		70-130

Lab Duplicate Analysis

Batch Quality Control

Project Name: PRINCETON TOWN CAMPUS

Project Number: Not Specified

Lab Number: L2026828

Report Date: 07/06/20

Parameter	Native Sample	Duplicate Sample	Units	RPD	Qual	RPD Limits
Perfluorinated Alkyl Acids by EPA 537 - Mansfield Lab Associated sample(s): 01 QC Batch ID: WG1386958-5 QC Sample: L2026828-01 Client ID: FINISH-TC001G WELL 1						
Perfluorobutanesulfonic Acid (PFBS)	16.1	20.6	ng/l	25		30
Perfluorohexanoic Acid (PFHxA)	1.48J	1.68J	ng/l	NC		30
Perfluoroheptanoic Acid (PFHpA)	1.25J	1.49J	ng/l	NC		30
Perfluorohexanesulfonic Acid (PFHxS)	81.7	98.1	ng/l	18		30
Perfluorooctanoic Acid (PFOA)	4.48	5.67	ng/l	23		30
Perfluorononanoic Acid (PFNA)	ND	ND	ng/l	NC		30
Perfluorooctanesulfonic Acid (PFOS)	23.5	29.2	ng/l	22		30
Perfluorodecanoic Acid (PFDA)	ND	ND	ng/l	NC		30
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	ND	ND	ng/l	NC		30
Perfluoroundecanoic Acid (PFUnA)	ND	ND	ng/l	NC		30
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	ND	ND	ng/l	NC		30
Perfluorododecanoic Acid (PFDoA)	ND	ND	ng/l	NC		30
Perfluorotridecanoic Acid (PFTrDA)	ND	ND	ng/l	NC		30
Perfluorotetradecanoic Acid (PFTA)	ND	ND	ng/l	NC		30

Surrogate	%Recovery	Qualifier	%Recovery	Qualifier	Acceptance Criteria
Perfluoro-n-[1,2-13C2]hexanoic Acid (13C-PFHxA)	91		98		70-130
Perfluoro-n-[1,2-13C2]decanoic Acid (13C-PFDA)	79		99		70-130
N-Deuterioethylperfluoro-1-octanesulfonamidoacetic Acid (d5-NEtFOSAA)	90		90		70-130

Project Name: PRINCETON TOWN CAMPUS

Project Number: Not Specified

Sample Receipt and Container Information

Were project specific reporting limits specified?

YES

Cooler Information**Cooler** **Custody Seal**

A Absent

Container Information

Container ID	Container Type	Cooler	Initial pH	Final pH	Temp deg C	Pres	Seal	Frozen Date/Time	Analysis(*)
L2026828-01A	2 Plastic Trizma/1 Plastic/1 H2O+Trizma	A	NA		5.0	Y	Absent		A2-537(14)
L2026828-01B	2 Plastic Trizma/1 Plastic/1 H2O+Trizma	A	NA		5.0	Y	Absent		A2-537(14)
L2026828-02A	Plastic 250ml Trizma preserved	A	NA		5.0	Y	Absent		A2-537(14)

PFAS PARAMETER SUMMARY

Parameter	Acronym	CAS Number
PERFLUOROALKYL CARBOXYLIC ACIDS (PFCAs)		
Perfluorooctadecanoic Acid	PFODA	16517-11-6
Perfluorohexadecanoic Acid	PFHxDA	67905-19-5
Perfluorotetradecanoic Acid	PFTA	376-06-7
Perfluorotridecanoic Acid	PFTrDA	72629-94-8
Perfluorododecanoic Acid	PFDoA	307-55-1
Perfluoroundecanoic Acid	PFUnA	2058-94-8
Perfluorodecanoic Acid	PFDA	335-76-2
Perfluorononanoic Acid	PFNA	375-95-1
Perfluorooctanoic Acid	PFOA	335-67-1
Perfluoroheptanoic Acid	PFHpA	375-85-9
Perfluorohexanoic Acid	PFHxA	307-24-4
Perfluoropentanoic Acid	PFPeA	2706-90-3
Perfluorobutanoic Acid	PFBA	375-22-4
PERFLUOROALKYL SULFONIC ACIDS (PFSAs)		
Perfluorododecanesulfonic Acid	PFDoDS	79780-39-5
Perfluorodecanesulfonic Acid	PFDS	335-77-3
Perfluorononanesulfonic Acid	PFNS	68259-12-1
Perfluorooctanesulfonic Acid	PFOS	1763-23-1
Perfluoroheptanesulfonic Acid	PFHpS	375-92-8
Perfluorohexanesulfonic Acid	PFHxS	355-46-4
Perfluoropentanesulfonic Acid	PFPeS	2706-91-4
Perfluorobutanesulfonic Acid	PFBS	375-73-5
FLUOROTELOMERS		
1H,1H,2H,2H-Perfluorododecanesulfonic Acid	10:2FTS	120226-60-0
1H,1H,2H,2H-Perfluorodecanesulfonic Acid	8:2FTS	39108-34-4
1H,1H,2H,2H-Perfluorooctanesulfonic Acid	6:2FTS	27619-97-2
1H,1H,2H,2H-Perfluorohexanesulfonic Acid	4:2FTS	757124-72-4
PERFLUOROALKANE SULFONAMIDES (FASAs)		
Perfluorooctanesulfonamide	FOSA	754-91-6
N-Ethyl Perfluorooctane Sulfonamide	NEtFOSA	4151-50-2
N-Methyl Perfluorooctane Sulfonamide	NMeFOSA	31506-32-8
PERFLUOROALKANE SULFONYL SUBSTANCES		
N-Ethyl Perfluorooctanesulfonamido Ethanol	NEtFOSE	1691-99-2
N-Methyl Perfluorooctanesulfonamido Ethanol	NMeFOSE	24448-09-7
N-Ethyl Perfluorooctanesulfonamidoacetic Acid	NEtFOSAA	2991-50-6
N-Methyl Perfluorooctanesulfonamidoacetic Acid	NMeFOSAA	2355-31-9
PER- and POLYFLUOROALKYL ETHER CARBOXYLIC ACIDS		
2,3,3,3-Tetrafluoro-2-[1,1,2,2,3,3,3-Heptafluoropropoxy]-Propanoic Acid	HFPO-DA	13252-13-6
4,8-Dioxa-3h-Perfluorononanoic Acid	ADONA	919005-14-4
CHLORO-PERFLUOROALKYL SULFONIC ACIDS		
11-Chloroeicosafuoro-3-Oxaundecane-1-Sulfonic Acid	11Cl-PF3OUdS	763051-92-9
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid	9Cl-PF3ONS	756426-58-1

Project Name: PRINCETON TOWN CAMPUS**Lab Number:** L2026828**Project Number:** Not Specified**Report Date:** 07/06/20

GLOSSARY

Acronyms

DL	- Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the limit of quantitation (LOQ). The DL includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
EDL	- Estimated Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The EDL includes any adjustments from dilutions, concentrations or moisture content, where applicable. The use of EDLs is specific to the analysis of PAHs using Solid-Phase Microextraction (SPME).
EMPC	- Estimated Maximum Possible Concentration: The concentration that results from the signal present at the retention time of an analyte when the ions meet all of the identification criteria except the ion abundance ratio criteria. An EMPC is a worst-case estimate of the concentration.
EPA	- Environmental Protection Agency.
LCS	- Laboratory Control Sample: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LCSD	- Laboratory Control Sample Duplicate: Refer to LCS.
LFB	- Laboratory Fortified Blank: A sample matrix, free from the analytes of interest, spiked with verified known amounts of analytes or a material containing known and verified amounts of analytes.
LOD	- Limit of Detection: This value represents the level to which a target analyte can reliably be detected for a specific analyte in a specific matrix by a specific method. The LOD includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
LOQ	- Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.) Limit of Quantitation: The value at which an instrument can accurately measure an analyte at a specific concentration. The LOQ includes any adjustments from dilutions, concentrations or moisture content, where applicable. (DoD report formats only.)
MDL	- Method Detection Limit: This value represents the level to which target analyte concentrations are reported as estimated values, when those target analyte concentrations are quantified below the reporting limit (RL). The MDL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
MS	- Matrix Spike Sample: A sample prepared by adding a known mass of target analyte to a specified amount of matrix sample for which an independent estimate of target analyte concentration is available. For Method 332.0, the spike recovery is calculated using the native concentration, including estimated values.
MSD	- Matrix Spike Sample Duplicate: Refer to MS.
NA	- Not Applicable.
NC	- Not Calculated: Term is utilized when one or more of the results utilized in the calculation are non-detect at the parameter's reporting unit.
NDPA/DPA	- N-Nitrosodiphenylamine/Diphenylamine.
NI	- Not Ignitable.
NP	- Non-Plastic: Term is utilized for the analysis of Atterberg Limits in soil.
RL	- Reporting Limit: The value at which an instrument can accurately measure an analyte at a specific concentration. The RL includes any adjustments from dilutions, concentrations or moisture content, where applicable.
RPD	- Relative Percent Difference: The results from matrix and/or matrix spike duplicates are primarily designed to assess the precision of analytical results in a given matrix and are expressed as relative percent difference (RPD). Values which are less than five times the reporting limit for any individual parameter are evaluated by utilizing the absolute difference between the values; although the RPD value will be provided in the report.
SRM	- Standard Reference Material: A reference sample of a known or certified value that is of the same or similar matrix as the associated field samples.
STLP	- Semi-dynamic Tank Leaching Procedure per EPA Method 1315.
TEF	- Toxic Equivalency Factors: The values assigned to each dioxin and furan to evaluate their toxicity relative to 2,3,7,8-TCDD.
TEQ	- Toxic Equivalent: The measure of a sample's toxicity derived by multiplying each dioxin and furan by its corresponding TEF and then summing the resulting values.
TIC	- Tentatively Identified Compound: A compound that has been identified to be present and is not part of the target compound list (TCL) for the method and/or program. All TICs are qualitatively identified and reported as estimated concentrations.

Footnotes

Report Format: DU Report with 'J' Qualifiers

Project Name: PRINCETON TOWN CAMPUS**Lab Number:** L2026828**Project Number:** Not Specified**Report Date:** 07/06/20

- 1 - The reference for this analyte should be considered modified since this analyte is absent from the target analyte list of the original method.

Terms

Analytical Method: Both the document from which the method originates and the analytical reference method. (Example: EPA 8260B is shown as 1,8260B.) The codes for the reference method documents are provided in the References section of the Addendum.

Difference: With respect to Total Oxidizable Precursor (TOP) Assay analysis, the difference is defined as the Post-Treatment value minus the Pre-Treatment value.

Final pH: As it pertains to Sample Receipt & Container Information section of the report, Final pH reflects pH of container determined after adjustment at the laboratory, if applicable. If no adjustment required, value reflects Initial pH.

Frozen Date/Time: With respect to Volatile Organics in soil, Frozen Date/Time reflects the date/time at which associated Reagent Water-preserved vials were initially frozen. Note: If frozen date/time is beyond 48 hours from sample collection, value will be reflected in 'bold'.

Initial pH: As it pertains to Sample Receipt & Container Information section of the report, Initial pH reflects pH of container determined upon receipt, if applicable.

PAH Total: With respect to Alkylated PAH analyses, the 'PAHs, Total' result is defined as the summation of results for all or a subset of the following compounds: Naphthalene, C1-C4 Naphthalenes, 2-Methylnaphthalene, 1-Methylnaphthalene, Biphenyl, Acenaphthylene, Acenaphthene, Fluorene, C1-C3 Fluorenes, Phenanthrene, C1-C4 Phenanthrenes/Anthracenes, Anthracene, Fluoranthene, Pyrene, C1-C4 Fluoranthenes/Pyrenes, Benz(a)anthracene, Chrysene, C1-C4 Chrysenes, Benzo(b)fluoranthene, Benzo(j)+(k)fluoranthene, Benzo(e)pyrene, Benzo(a)pyrene, Perylene, Indeno(1,2,3-cd)pyrene, Dibenz(ah)+(ac)anthracene, Benzo(g,h,i)perylene. If a 'Total' result is requested, the results of its individual components will also be reported.

PFAS Total: With respect to PFAS analyses, the 'PFAS, Total (5)' result is defined as the summation of results for: PFHpA, PFHxS, PFOA, PFNA and PFOS. If a 'Total' result is requested, the results of its individual components will also be reported.

The target compound Chlordane (CAS No. 57-74-9) is reported for GC ECD analyses. Per EPA, this compound "refers to a mixture of chlordane isomers, other chlorinated hydrocarbons and numerous other components." (Reference: USEPA Toxicological Review of Chlordane, In Support of Summary Information on the Integrated Risk Information System (IRIS), December 1997.)

Total: With respect to Organic analyses, a 'Total' result is defined as the summation of results for individual isomers or Aroclors. If a 'Total' result is requested, the results of its individual components will also be reported. This is applicable to 'Total' results for methods 8260, 8081 and 8082.

Data Qualifiers

- A** - Spectra identified as "Aldol Condensates" are byproducts of the extraction/concentration procedures when acetone is introduced in the process.
- B** - The analyte was detected above the reporting limit in the associated method blank. Flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For MCP-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank. For DOD-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte at less than ten times (10x) the concentration found in the blank AND the analyte was detected above one-half the reporting limit (or above the reporting limit for common lab contaminants) in the associated method blank. For NJ-Air-related projects, flag only applies to associated field samples that have detectable concentrations of the analyte above the reporting limit. For NJ-related projects (excluding Air), flag only applies to associated field samples that have detectable concentrations of the analyte, which was detected above the reporting limit in the associated method blank or above five times the reporting limit for common lab contaminants (Phthalates, Acetone, Methylene Chloride, 2-Butanone).
- C** - Co-elution: The target analyte co-elutes with a known lab standard (i.e. surrogate, internal standards, etc.) for co-extracted analyses.
- D** - Concentration of analyte was quantified from diluted analysis. Flag only applies to field samples that have detectable concentrations of the analyte.
- E** - Concentration of analyte exceeds the range of the calibration curve and/or linear range of the instrument.
- G** - The concentration may be biased high due to matrix interferences (i.e. co-elution) with non-target compound(s). The result should be considered estimated.
- H** - The analysis of pH was performed beyond the regulatory-required holding time of 15 minutes from the time of sample collection.
- I** - The lower value for the two columns has been reported due to obvious interference.
- J** - Estimated value. The Target analyte concentration is below the quantitation limit (RL), but above the Method Detection Limit (MDL) or Estimated Detection Limit (EDL) for SPME-related analyses. This represents an estimated concentration for Tentatively Identified Compounds (TICs).
- M** - Reporting Limit (RL) exceeds the MCP CAM Reporting Limit for this analyte.
- ND** - Not detected at the method detection limit (MDL) for the sample, or estimated detection limit (EDL) for SPME-related analyses.
- NJ** - Presumptive evidence of compound. This represents an estimated concentration for Tentatively Identified Compounds (TICs), where the identification is based on a mass spectral library search.
- P** - The RPD between the results for the two columns exceeds the method-specified criteria.
- Q** - The quality control sample exceeds the associated acceptance criteria. For DOD-related projects, LCS and/or Continuing Calibration

Report Format: DU Report with 'J' Qualifiers



Project Name: PRINCETON TOWN CAMPUS
Project Number: Not Specified

Lab Number: L2026828
Report Date: 07/06/20

Data Qualifiers

Standard exceedences are also qualified on all associated sample results. Note: This flag is not applicable for matrix spike recoveries when the sample concentration is greater than 4x the spike added or for batch duplicate RPD when the sample concentrations are less than 5x the RL. (Metals only.)

- R** - Analytical results are from sample re-analysis.
- RE** - Analytical results are from sample re-extraction.
- S** - Analytical results are from modified screening analysis.

Project Name: PRINCETON TOWN CAMPUS

Lab Number: L2026828

Project Number: Not Specified

Report Date: 07/06/20

REFERENCES

- 122 Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS). EPA Method 537, EPA/600/R-08/092. Version 1.1, September 2009.

LIMITATION OF LIABILITIES

Alpha Analytical performs services with reasonable care and diligence normal to the analytical testing laboratory industry. In the event of an error, the sole and exclusive responsibility of Alpha Analytical shall be to re-perform the work at it's own expense. In no event shall Alpha Analytical be held liable for any incidental, consequential or special damages, including but not limited to, damages in any way connected with the use of, interpretation of, information or analysis provided by Alpha Analytical.

We strongly urge our clients to comply with EPA protocol regarding sample volume, preservation, cooling, containers, sampling procedures, holding time and splitting of samples in the field.



Certification Information

The following analytes are not included in our Primary NELAP Scope of Accreditation:

Westborough Facility

EPA 624/624.1: m/p-xylene, o-xylene, Naphthalene

EPA 8260C: NPW: 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene, Azobenzene; SCM: Iodomethane (methyl iodide), 1,2,4,5-Tetramethylbenzene; 4-Ethyltoluene.

EPA 8270D: NPW: Dimethylnaphthalene, 1,4-Diphenylhydrazine; SCM: Dimethylnaphthalene, 1,4-Diphenylhydrazine.

SM4500: NPW: Amenable Cyanide; SCM: Total Phosphorus, TKN, NO₂, NO₃.

Mansfield Facility

SM 2540D: TSS

EPA 8082A: NPW: PCB: 1, 5, 31, 87, 101, 110, 141, 151, 153, 180, 183, 187.

EPA TO-15: Halothane, 2,4,4-Trimethyl-2-pentene, 2,4,4-Trimethyl-1-pentene, Thiophene, 2-Methylthiophene, 3-Methylthiophene, 2-Ethylthiophene, 1,2,3-Trimethylbenzene, Indan, Indene, 1,2,4,5-Tetramethylbenzene, Benzothiophene, 1-Methylnaphthalene.

EPA TO-12 Non-methane organics

EPA 3C Fixed gases

Biological Tissue Matrix: EPA 3050B

The following analytes are included in our Massachusetts DEP Scope of Accreditation

Westborough Facility:

Drinking Water

EPA 300.0: Chloride, Nitrate-N, Fluoride, Sulfate; **EPA 353.2:** Nitrate-N, Nitrite-N; **SM4500NO3-F:** Nitrate-N, Nitrite-N; **SM4500F-C, SM4500CN-CE, EPA 180.1, SM2130B, SM4500CI-D, SM2320B, SM2540C, SM4500H-B, SM4500NO2-B**

EPA 332: Perchlorate; **EPA 524.2:** THMs and VOCs; **EPA 504.1:** EDB, DBCP.

Microbiology: **SM9215B; SM9223-P/A, SM9223B-Colilert-QT, SM9222D.**

Non-Potable Water

SM4500H,B, EPA 120.1, SM2510B, SM2540C, SM2320B, SM4500CL-E, SM4500F-BC, SM4500NH3-BH: Ammonia-N and Kjeldahl-N, **EPA 350.1:** Ammonia-N, **LACHAT 10-107-06-1-B:** Ammonia-N, **EPA 351.1, SM4500NO3-F, EPA 353.2:** Nitrate-N, **SM4500P-E, SM4500P-B, E, SM4500SO4-E, SM5220D, EPA 410.4, SM5210B, SM5310C, SM4500CL-D, EPA 1664, EPA 420.1, SM4500-CN-CE, SM2540D, EPA 300:** Chloride, Sulfate, Nitrate.

EPA 624.1: Volatile Halocarbons & Aromatics,

EPA 608.3: Chlordane, Toxaphene, Aldrin, alpha-BHC, beta-BHC, gamma-BHC, delta-BHC, Dieldrin, DDD, DDE, DDT, Endosulfan I, Endosulfan II, Endosulfan sulfate, Endrin, Endrin Aldehyde, Heptachlor, Heptachlor Epoxide, PCBs

EPA 625.1: SVOC (Acid/Base/Neutral Extractables), **EPA 600/4-81-045:** PCB-Oil.

Microbiology: **SM9223B-Colilert-QT; Enterolert-QT, SM9221E, EPA 1600, EPA 1603.**

Mansfield Facility:

Drinking Water

EPA 200.7: Al, Ba, Cd, Cr, Cu, Fe, Mn, Ni, Na, Ag, Ca, Zn. **EPA 200.8:** Al, Sb, As, Ba, Be, Cd, Cr, Cu, Pb, Mn, Ni, Se, Ag, TL, Zn. **EPA 245.1** Hg. **EPA 522.**

Non-Potable Water

EPA 200.7: Al, Sb, As, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Sr, TL, Ti, V, Zn.

EPA 200.8: Al, Sb, As, Be, Cd, Cr, Cu, Fe, Pb, Mn, Ni, K, Se, Ag, Na, TL, Zn.

EPA 245.1 Hg.

SM2340B

For a complete listing of analytes and methods, please contact your Alpha Project Manager.



CHAIN OF CUSTODY

PAGE _____ OF _____

WESTBORO, MA
TEL: 508-898-9220
FAX: 508-898-9193

MANSFIELD, MA
TEL: 508-822-9300
FAX: 508-822-3288

Date Rec'd in Lab: 6/25/20

ALPHA Job #: L2026828

Project Information

Project Name: Princeton Town Campus

Project Location: Princeton Bagg Hall

Project #:

Project Manager:

ALPHA Quote #:

Turn-Around Time

Standard RUSH (only confirmed if pre-approved!)

Date Due: _____ Time: _____

Report Information - Data Deliverables

FAX EMAIL
 ADEx Add'l Deliverables

Billing Information

Same as Client info PO #:
N/A Per Mass DEP Request

Client Information

Client: WhiteWater

Address:

Phone:

Fax:

Email:

These samples have been previously analyzed by Alpha

Other Project Specific Requirements/Comments/Detection Limits:

Regulatory Requirements/Report Limits

State /Fed Program Criteria

ANALYSIS PFAS		TOTAL # BOTTLES
SAMPLE HANDLING		
Filtration _____		
<input type="checkbox"/> Done		
<input type="checkbox"/> Not needed		
<input type="checkbox"/> Lab to do		
Preservation		
<input type="checkbox"/> Lab to do		
<small>(Please specify below)</small>		
Sample Specific Comments		

ALPHA Lab ID (Lab Use Only)	Sample ID	Collection		Sample Matrix	Sampler's Initials
		Date	Time		
	PFAS				
26828-01	Finish-TC001G Well 2	6/23/2020	12:30	WH	✓

Container Type	
Preservative	

Please print clearly, legibly and completely. Samples can not be logged in and turnaround time clock will not start until any ambiguities are resolved. All samples submitted are subject to Alpha's Terms and Conditions. See reverse side.

Relinquished By:	Date/Time	Received By:	Date/Time
William Hibbs	6/23/2020 16:00	MGM	6/25/20 13:10
MGM	6/23/20 14:46	ALC	6/25/20 17:28
ALC	6/25/20 15:05	MGM	6/25/20 17:05
MGM	6/25/20 10:05	ALC	6/25/20 16:05