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PER- AND POLY-FLUOROALKYL SUBSTANCES CHARACTERIZATION STUDY SUMMARY REPORT LOWER ISSAQUAH VALLEY ISSAQUAH, WASHINGTON

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ACRONYMS AND ABBREVIATIONS

AFFF	aqueous film-forming foams
ALS	ALS Environmental-Kelso of Kelso, Washington
bgs	below ground surface
Cascade	Cascade Environmental, LP of Tacoma, Washington
Dodd Fields Park	southeastern portion of King County Parcel No. 2824069012 at 555 Northwest Holly Street in Issaquah, Washington
Ecology	Washington State Department of Ecology
EFR	Eastside Fire & Rescue
EPA	U.S. Environmental Protection Agency
ESSB	Engrossed Substitute Senate Bill
Farallon	Farallon Consulting, L.L.C.
Fire District 10	King County Fire Protection District 10
Holt	Holt Services, Inc. of Puyallup, Washington
long-chain PFAS	per- and poly-fluoroalkyl substances with a fully fluorinated tail containing nine or more carbons
Memorial Field	southern portion of King County Parcel No. 5279100070 north of 190 East Sunset Way in Issaquah, Washington
µg/l	microgram per liter
mg/kg	milligram per kilogram
MRL	method reporting limit
MTCA	Washington State Model Toxics Control Act Cleanup Regulation
MS	matrix spike
MSD	matrix-spike duplicate
NAVD88	North American Vertical Datum of 1988, the vertical datum for measuring elevation

Parties	Eastside Fire & Rescue, the City of Issaquah, and the Washington State Department of Ecology
PFAS	per- and poly-fluoroalkyl substances
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonic acid
Rainier Trail	central portion of King County Parcel No. 3424069043, including a landscaped median strip constructed over the former rail grade
RPD	relative percent difference
short-chain PFAS	per- and poly-fluoroalkyl substances with a fully fluorinated tail containing four to seven carbons
SOP	standard operating procedure
Study	Lower Issaquah Valley Per- and Poly-Fluoroalkyl Substances Characterization Study
WAC	Washington Administrative Code
West Playfield	southwestern portion of King County Parcel No. 2824069012 at 555 Northwest Holly Street in Issaquah, Washington
Work Plan	*Final Per- and Poly-Fluoroalkyl Substances Characterization Study Work Plan, Lower Issaquah Valley, Issaquah, Washington* dated August 6, 2018, prepared by Farallon Consulting, L.L.C.

GLOSSARY OF TERMS

conceptual site model	As defined in Section 200 of Chapter 173-340 of the Washington Administrative Code, "a conceptual understanding of a site that identifies potential or suspected sources of hazardous substances, types and concentrations of hazardous substances, potentially contaminated media, and actual and potential exposure pathways and receptors. This model is initially developed during the scoping of the remedial investigation and further refined as additional information is collected on the site. It is a tool used to assist in making decisions at a site."
deep groundwater	Groundwater encountered at depths greater than 120 feet below ground surface; it may also be referred to as deep zone groundwater or the deep groundwater-bearing zone.
groundwater	Water encountered below the ground surface.
groundwater yield	The volume of water discharged from a well measured over a period of time. Typical units are gallons per minute or cubic meters per day.
intermediate groundwater	Groundwater encountered at depths from 60 feet below ground surface to a maximum depth of 120 feet below ground surface; it may also be referred to as intermediate zone groundwater or the intermediate groundwater-bearing zone.
Investigatory Level	Washington State Department of Ecology numerical criteria based on standard exposure scenarios presented under the Washington State Model Toxics Control Act Cleanup Regulation, toxicity data published by the U.S. Environmental Protection Agency (2016a, 2016b), and chemical properties published by the U.S. Environmental Protection Agency (2014).
reconnaissance groundwater	Groundwater collected from a boring using a temporary screen. Reconnaissance groundwater samples may have higher turbidity than samples collected from developed monitoring wells, and are collected from the aquifer sampled under "stressed" or non-static conditions.
shallow groundwater	Groundwater encountered at depths from 5 feet below ground surface to a maximum depth of 60 feet below ground

	surface; it may also be referred to as shallow zone groundwater or the shallow groundwater-bearing zone.
vadose zone	The portion of the soil column containing water under pressure of less than 1 atmosphere; the vadose zone is limited above by the ground surface, and below by the zone of saturation where all pore space is filled with water (e.g., the water table).

EXECUTIVE SUMMARY

Farallon has prepared this Summary Report on behalf of Eastside Fire & Rescue to summarize the work performed and analytical results for the Lower Issaquah Valley Per- and Poly-Fluoroalkyl Substances (PFAS) Characterization Study performed August to October 2018 (Study). The Study was performed under two agreements: an Interagency Agreement between Eastside Fire & Rescue and the Washington State Department of Ecology; and an Interlocal Agreement between Eastside Fire & Rescue and the City of Issaquah. The overall purpose of the Study was to assess potential impacts of PFAS associated with aqueous film-forming foam (AFFF) training exercises to soil and groundwater in the Lower Issaquah Valley. The overall purpose of the Study was satisfied through the collection of soil, reconnaissance groundwater, and groundwater samples at, and down-gradient of, confirmed and/or suspected sources in areas of interest identified in the Lower Issaquah Valley, which in turn met the requirements of the specific Study objectives.

PFAS are a class of chemicals that were developed for a wide range of uses due to their high level of chemical stability, miscibility, and surface tension and friction reduction properties. PFAS, including perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS), were widely used in AFFF for fighting petroleum hydrocarbon and liquid fuel fires. The application of AFFF on fires and spraying in open areas as part of training exercises are now recognized as the primary mechanisms for the release of PFAS into the environment.

Since their invention and widespread use, concern has increased regarding PFAS toxicity and the risks associated with exposure to PFAS-impacted media. The U.S. Environmental Protection Agency established lifetime Health Advisory Levels for PFOS and PFOA in drinking water in 2016. PFAS are not currently regulated as hazardous substances in Washington State under the Model Toxics Control Act. For this investigation, Ecology (2018a) has developed Investigatory Levels that include numerical criteria based on exposure scenarios for groundwater (drinking water scenario), residential and industrial uses (soil contact), and concentrations in soil for protection of groundwater for unsaturated and saturated soil (see Section 2.7, Regulatory Criteria).

The Study evaluated five areas of interest where historical interviews and/or previous investigation results indicated AFFF had been released primarily through training exercises. The scope of work for the Study included:

- Collecting multi-incremental soil samples from 8 decision units at a depth interval of 0 to 6 inches below ground surface to evaluate the direct exposure pathway for surficial soil;
- Advancing 13 sonic drill rig borings and 1 hand-auger boring for discrete vadose zone soil sampling and/or shallow zone reconnaissance groundwater sampling to evaluate potential PFAS impacts to soil and groundwater;
- Installing, developing, and surveying 14 monitoring wells based on reconnaissance groundwater analytical results to evaluate groundwater quality and flow direction at five areas of interest; and
- Gauging and sampling 10 existing monitoring wells and the 14 new monitoring wells installed as part of the Study.

Concentrations of PFAS, including PFOA and PFOS, were less than the Investigatory Level for unrestricted (residential) direct contact in all soil samples analyzed. The analytical results indicate that soil sampled as part of this Study does not present a direct contact risk to human health; therefore, protective measures to address exposure to the soil that would occur during use of public spaces for sports, leisure, or other activities are not necessary.

Analytical data for samples collected during the Study confirm that shallow and/or vadose zone soil at all five areas of interest has been impacted with PFAS at concentrations that exceed the Investigatory Level for protection of groundwater for unsaturated soil. Analytical data for reconnaissance groundwater and groundwater samples confirm that the pathway for migration of PFAS from soil to shallow groundwater is complete for each area of interest. Confirmed groundwater impacts at concentrations that exceed the Investigatory Level are present in both shallow (10- to 60-foot-deep) and intermediate (60- to 120-foot-deep) groundwater at multiple locations on the western portion of the Lower Issaquah Valley.

PFOS initially was detected in groundwater samples collected between 2013 and 2018 from City of Issaquah Water Supply Well #4 (i.e., production well COI-PW04) at concentrations ranging between 0.296 and 0.6 microgram per liter (µg/l). PFOA was detected in production well COI-PW04 well water during the same period at concentrations that ranged from 0.00651 to 0.022 µg/l. Analytical results for intermediate groundwater samples collected during this Study indicate that concentrations of PFOS exceed the Investigatory Level in the west-central portion of the Lower Issaquah Valley from approximately Northwest Dogwood Street to north of Northwest Juniper Street. However, PFOS concentrations decline to less than the Investigatory Level in monitoring wells closer to production well COI-PW04. Preliminary groundwater sampling results from production well COI-PW05 indicate that PFAS concentrations, including PFOS, PFOA, and the sum of PFOS and PFOA, in deep groundwater pumped from the well are less than Investigatory Levels.

1.0 INTRODUCTION

Farallon Consulting, L.L.C. (Farallon) has prepared this Summary Report on behalf of Eastside Fire & Rescue (EFR) to summarize the work performed and analytical results for the Lower Issaquah Valley Per- and Poly-Fluoroalkyl Substances (PFAS) Characterization Study (Study). Farallon performed the Study on behalf of EFR, the City of Issaquah, and the Washington State Department of Ecology (Ecology), collectively referred to as the Parties. The Study was performed under two agreements: an Interagency Agreement between EFR and Ecology; and an Interlocal Agreement between EFR and the City of Issaquah. The overall purpose of the study was to assess potential impacts of PFAS associated with aqueous film forming foam (AFFF) training exercises to soil and groundwater in the Lower Issaquah Valley. Prior to performing the field investigation, Farallon (2018b) prepared the *Final Per- and Poly-Fluoroalkyl Substances Characterization Study Work Plan, Lower Issaquah Valley, Issaquah, Washington* dated August 6, 2018 (Work Plan) (Appendix A) to structure and guide investigation work. The Work Plan was reviewed and approved by the Parties on August 6, 2018. Study field investigation work was conducted between August 3 and October 29, 2018.

The specific Study objectives are presented in Section 3.1 of this Summary Report, and include identification of areas of interest; investigation of the presence of PFAS in vadose and/or saturated soil; identification and evaluation of shallow groundwater; and collection of synoptic area-wide intermediate zone groundwater quality data in the Lower Issaquah Valley (Figure 1). Previous work performed by the City of Issaquah, a records review, and interviews with local firefighting personnel identified five "areas of interest" with confirmed historical use of AFFF in firefighting training exercises (Figure 2). These five areas of interest were selected for further evaluation as part of the Study.

PFAS are a class of chemicals that were developed for a wide range of uses due to their high level of chemical stability, miscibility, and surface tension and friction reduction properties. PFAS, including perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS), were widely used in AFFF for fighting petroleum hydrocarbon and liquid fuel fires. The application of AFFF on fires and spraying in open areas as part of training exercises is now recognized as one of the primary mechanisms for the release of PFAS into the environment (Interstate Technology Regulatory Council [ITRC] 2017). However, many other sources of PFAS have also been documented (ITRC 2017).

Concern regarding the toxicity of PFAS, and the potential risks associated with long-term exposure, have increased since initial studies of occupational exposure were performed in the 1970s. In 2009, PFOS was listed in Annex B of the Stockholm Convention as a persistent organic pollutant; PFOA and the six-carbon PFAS perfluorohexane sulfonic acid were also subsequently proposed for listing (ITRC 2017). In 2016, the U.S. Environmental Protection Agency (EPA) issued a lifetime health advisory for PFOS, PFOA, and the sum of PFOS and PFOA concentrations in drinking water of 0.070 microgram per liter (µg/l). To date, Washington State has not identified PFAS as hazardous substances regulated under the Washington State Model Toxics Control Act Cleanup Regulation (MTCA); however, the Washington State Board of Health began rulemaking in December 2017 to address PFAS in drinking water. The Washington State Department of Health is conducting a statewide voluntary drinking water sampling project to determine the extent of PFAS occurrence in the State and assist the Washington State Board of Health with its rulemaking. Additional regulatory detail is provided in Section 2.1, Per- and Poly-Fluoroalkyl Substances Background, and the Work Plan.

Sampling for PFAS in groundwater pumped from City of Issaquah Water Supply Well #4 (i.e., production well COI-PW04) began in 2013 as part of the EPA Unregulated Contaminant Monitoring Rule. PFAS, including PFOA and PFOS, were detected at concentrations ranging from 0.00651 to 0.6 µg/l in groundwater samples collected from production well COI-PW04 (Appendix B). PFOS was detected at a concentration of 0.6 µg/l in the groundwater sample collected from production well COI-PW04 in 2013. PFOA was detected at a concentration of 0.0215 µg/l in the same sample. PFOA and PFOS were subsequently detected in Sammamish Plateau Water and Sewer District production wells #7 and #8 (i.e., SP-PW07 and SP-PW08) at concentrations less than the Investigatory Level of 0.070 µg/l beginning in June 2016.[1] The City of Issaquah subsequently conducted a limited initial investigation that identified a potential PFAS source to groundwater approximately 0.5 mile south of the production wells at 175 Newport Way Northwest. Additional information is provided in Section 2.5, Summary of Previous Studies and Existing Data, and the Work Plan.

Although PFAS are not regulated as hazardous substances under federal or Washington State law, all field investigation work and reporting performed for the Study is consistent with the requirements of MTCA, as established in Chapter 173-340 of the Washington Administrative Code (WAC 173-340).

1.1 PURPOSE

The specific purposes of this Summary Report are to:

- Describe characterization work performed at selected areas of interest;
- Identify final sample locations and media in the Lower Issaquah Valley, sample quantities, and analytical methods;
- Identify and document deviations from the Work Plan that occurred during characterization work; and
- Report analytical results obtained through the characterization work performed as part of the Study.

[1] This report references the Investigatory Levels for groundwater sampled from both monitoring and production wells. The EPA Health Advisory Level, while numerically equivalent to the current Investigatory Level for groundwater, does not apply to production well water until after treatment when the water enters the service water system as potential drinking water.

1.2 REPORT ORGANIZATION

This Summary Report summarizes the results of previous investigations and presents the results of the Study conducted by Farallon. The report is organized into the following sections:

- **Section 2**, **Background**, provides a summary of the PFAS history of use and describes the Study area and its surroundings, the project problem statement, the locations where characterization work was performed, parameters of interest, and regulatory criteria.
- **Section 3**, **Study Description**, describes the work elements performed, including objectives, field procedures, and the scope of work performed.
- **Section 4**, **Study Results**, provides a summary of the analytical results and quality assurance and quality control results for samples collected as part of the Study.
- **Section 5**, **Conclusions**, provides Farallon's conclusions regarding Study results.
- **Section 7**, **References**, provides a list of the documents cited in this report.
- **Section 8**, **Limitations**, presents Farallon's standard limitations associated with conducting the work described herein and preparing this report.

2.0 BACKGROUND

This section provides background on PFAS and describes the Study area and its surroundings, the project problem statement, the areas of interest addressed by the Study, parameters of interest, and regulatory criteria.

2.1 PER- AND POLY-FLUOROALKYL SUBSTANCES BACKGROUND

PFAS are a class of chemicals that were developed for a wide range of uses, including imparting oil and/or water repellency, firefighting, and friction and surface tension reduction, beginning in the 1940s. Due to the unique properties associated with PFAS carbon-fluorine chemistry, these chemicals have found use in a wide array of industries, including aerospace, photographic imaging, metal plating, firefighting, carpet cleaning, food and beverage packaging, automotive, construction, printing, and oil and gas production (ITRC 2017).

Two commonly detected PFAS are PFOS and PFOA. These chemicals are structured with a weakly ionic "head" (a sulfate or carboxylate group) and a fully fluorinated tail of eight carbons. Due to their stability at high temperatures and surfactant properties associated with the stable fluorine tail, PFOS and PFOA have found widespread use in AFFF for fighting and extinguishing hydrocarbon fuel fires (Moody and Field 1999). Other PFAS have variable carbon chain lengths and some are not fully fluorinated (i.e., polyfluorinated).

The effectiveness of PFAS-bearing concentrates at "knocking down" and smothering hydrocarbon fuel fires resulted in widespread use by agencies and facilities such as fire departments, municipal airports, petroleum fuel tank farms, and military bases, which regularly handle aviation fuel or other hydrocarbons. Typical AFFF consisted of concentrate mixed with water to yield a 3 percent solution. Because special handling was needed to generate and deploy AFFF at a fire, regular training to set up and use AFFF firefighting equipment was common among the firefighting entities using this product. Due to the nature of the training exercises, which typically included equipment setup and practice mixing concentrate and water to the desired proportion with a foam aerator by multiple individuals, AFFF training currently is recognized as one of the primary pathways for release of concentrated PFAS to the environment (ITRC 2017).

Since their invention, PFAS have been incorporated into more than 3,000 manmade chemicals (Wang et al. 2017) and currently have achieved a global environmental distribution. Concerns regarding PFAS health effects were first raised in the 1970s when PFOA was detected in 3M Manufacturing Company worker blood, and subsequently in human blood bank samples in 1998. EPA (2003) began development of Enforceable Consent Agreements with PFAS manufacturers in 2003 to set in place industry-sponsored testing to identify sources of PFOA in the environment and the pathways for human exposure. In 2009, PFOS and related compounds were listed under the Stockholm Convention on Persistent Organic Pollutants Annex B, which targets listed chemicals for restricted production and use (Lindstrom et al. 2011).

In 2016, EPA (2016c) established lifetime Health Advisory Levels for PFOA and PFOS in drinking water, the primary pathway for exposure, of a combined value of 70 nanograms per liter

(0.07 µg/l). The Health Advisory for PFOS identified both cancer and non-cancer health risks associated with increased body burdens of the chemical. Identified risks include cancer of the bladder, colon, thyroid, breast, and prostate; increases in total cholesterol; and changes in thyroid function and hormone levels. Additional risks were identified for fertility and development (EPA 2016a).

The Washington State Legislature introduced Engrossed Substitute Senate Bill (ESSB) 6413 in 2017. ESSB 6413 aims to reduce PFAS use and distribution in the environment by targeting PFAS-bearing AFFF in Washington State for elimination in firefighting training in 2018, and prohibiting the manufacture, distribution, and sale of PFAS-bearing AFFF with some exceptions[2] in 2020. A second bill, ESSB 2658, aims to eliminate PFAS in food packaging by 2022, replacing these compounds with safer alternative chemicals.

2.2 STUDY AREA AND SURROUNDINGS

The Lower Issaquah Valley is located east of Seattle and south of Lake Sammamish (Figure 1). Valley floor elevations range from approximately 40 to 160 feet North American Vertical Datum of 1988 (NAVD88). The Lower Issaquah Valley is roughly bisected by Issaquah Creek, which runs longitudinally along the valley floor and flows to the north into Lake Sammamish. The City of Issaquah is located in the northern portion of the Lower Issaquah Valley. Drinking water for the City of Issaquah is pumped from a system of four wells (two in the northeastern and two in the northwestern portions of Issaquah) and through service water delivery by the Cascade Water Alliance.

According to the Western Regional Climate Center (2016), the climate of the greater Seattle area, including Puget Sound and the Lower Issaquah Valley, is maritime and characterized by cool summers and mild winters influenced by ocean air. Based on data published for the Snoqualmie Falls, Washington meteorological station (Identification No. 457773), the average annual minimum temperature for the Lower Issaquah Valley is 32 degrees Fahrenheit, and the average annual maximum temperature is 76 degrees Fahrenheit. The average annual precipitation ranges from 33 to 81 inches, with an average of 5 to 8 inches per month from October through March (U.S. Climate Data 2016).

The Puget Sound region is underlain by Quaternary sediments deposited by multiple glacial episodes. Deposition occurred during glacial advances and retreats, which created the existing subsurface conditions. The regional sediments consist primarily of interlayered and/or sequential deposits of alluvial clays, silts, and sands that typically are situated over deposits of glacial till that consist of silty sand to sandy silt with gravel. Outwash sediments consisting of sands, silts, clays, and gravels were deposited by rivers, streams, and post-glacial lakes during the glacial retreats and have been largely over-consolidated by the overriding ice sheets.

The geology of the Lower Issaquah Valley comprises a series of interbedded sand-gravel and silt-clay layers overlying the bedrock units that form the adjacent foothills to the east and west of the

[2] Exceptions include use at Federal Aviation Administration-regulated airports, petroleum refineries and terminals, and large chemical plants.

Lower Issaquah Valley. Shallow site-specific geology and hydrogeology descriptions are provided in Section 2.4, Areas of Interest.

For the purposes of the Study, water-bearing zones identified in the Lower Issaquah Valley have been divided into shallow, intermediate, and deep intervals for discussion purposes. Shallow groundwater is encountered at depths between approximately 5 to 60 feet below ground surface (bgs). Reconnaissance groundwater sampling and new monitoring wells installed as part of the Study targeted shallow groundwater (Table 1; Figure 3). Intermediate groundwater is encountered at depths between approximately 60 and 120 feet bgs and includes City of Issaquah production well COI-PW04 and previously installed monitoring wells COI-MW01 through COI-MW07 (Table 1). Deep groundwater is encountered at depths greater than 120 feet bgs. City of Issaquah production well COI-PW05, screened from 323 to 405 feet bgs (Table 1), extracts deep groundwater. Groundwater sampling results from production well COI-PW05 monitoring conducted by the City of Issaquah between 2015 and 2018 indicate PFAS impacts to groundwater extracted by the production well are less than Investigatory Levels. The extent of PFAS impacts to deep groundwater within the Lower Issaquah Valley has not been characterized. It is expected that shallow groundwater flow direction varies seasonally and with location in the Lower Issaquah Valley (Table 2; Figure 3).

Initial observations during reconnaissance and monitoring well groundwater sampling included seasonal changes in groundwater elevation at Memorial Field between August and October 2018, and moderate changes in shallow groundwater flow direction for October 2018 groundwater elevation data. Based on multiple groundwater-level measurement events, it appears that intermediate groundwater flows generally to the north toward Lake Sammamish (Table 2; Figure 3). Deep groundwater flow direction has not been established. Previous studies have demonstrated that pumping in production wells operated by the City of Issaquah, the Sammamish Plateau Water and Sewer District, Darigold, and/or other entities may influence the direction of groundwater flow at distances up to 3,150 feet from the well (Golder Associates 2016).

2.3 PROJECT PROBLEM STATEMENT

PFAS, including PFOA and PFOS, initially were detected in groundwater samples collected from City of Issaquah production well COI-PW04 as part of Unregulated Contaminant Monitoring Rule sampling performed by EPA in 2013. PFOS was detected at a concentration of 0.6 μg/l in the groundwater sample collected from production well COI-PW04 in 2013. Subsequent detections of PFOS concentrations in groundwater samples collected by the City of Issaquah from 2014 through 2018 ranged from 0.534 to 0.296 μg/l (Appendix B). Concentrations of PFOS in groundwater samples collected from production well COI-PW04 have declined slightly over time, although they continue to exceed the Investigatory Level. Concentrations of PFOA in groundwater samples collected from production well COI-PW04 have remained less than the Investigatory Level throughout the sampling period from 2013 through 2018 (Appendix B).

EFR, the City of Issaquah, and the Sammamish Plateau Water and Sewer District have previously performed limited characterization work to evaluate a suspected source area (175 Newport Way Northwest in Issaquah, Washington), and to further investigate the presence of PFAS in shallow and intermediate groundwater in the Lower Issaquah Valley. These previous investigations have confirmed the release of PFAS to soil at 175 Newport Way Northwest. Additional reconnaissance and monitoring well groundwater sampling performed by the City of Issaquah identified a plume of impacted shallow and intermediate groundwater extending north toward City of Issaquah production well COI-PW04. Further sampling performed by the City of Issaquah in 2016 confirmed the presence of PFAS in soil on the eastern portion of the Lower Issaquah Valley proximate to 190 East Sunset Way and west of 135 East Sunset Way (City of Issaquah Public Works Engineering [City of Issaquah] 2017).

The suspected primary mechanisms for the release of PFAS to the environment are the historical uses of AFFF during training exercises and for fighting flammable liquid fires (primarily petroleum). This Study was designed to assess potential impacts of PFAS associated with AFFF training exercises to soil and groundwater at, and down-gradient of, confirmed and/or suspected sources in areas of interest within the Lower Issaquah Valley. Study objectives are presented in Section 3.1.

2.4 HISTORY OF FIREFIGHTING ORGANIZATIONS IN LOWER ISSAQUAH VALLEY

King County Fire Protection District 10 (Fire District 10) was formed on June 30, 1941 by King County Commissioners' Resolution No. 8067 to provide fire prevention services, fire suppression services, and other services in the Lower Issaquah Valley and surrounding area in King County (Fire District 10 2017). Prior to January 1, 1999, the City of Issaquah operated its own fire department and facilities. During their periods of independent operation, Fire District 10 and the City of Issaquah fire department trained in numerous locations throughout the Lower Issaquah Valley, including the areas of interest identified in this report. Training in most instances was conducted by individual departments, but exercises often used the same locations due to favorable amounts of space, building heights, service water availability, and other traits.

On January 1, 1999, several agencies entered into an Interlocal Agreement to establish EFR, a joint fire and emergency medical services department serving the Lower Issaquah Valley and surrounding areas. The agencies entering into this Interlocal Agreement included Fire District 10, King County Fire Protection District 38, the City of Issaquah, and the City of North Bend, with the City of Sammamish entering into the Agreement on January 1, 2001 (Fire District 10 2017). EFR's current facility at 175 Newport Way Northwest was constructed in 1982 based on King County records. Fire District 10 built the facility and operated it prior to 1999 as a headquarters, a mechanical maintenance facility (primarily for vehicle maintenance), and an active fire station. EFR began operations at 175 Newport Way Northwest in 1999; however, Fire District 10 still owns the property. The original main building has gradually been converted to serve primarily as the current administrative office and maintenance facility for EFR, and no longer operates as an active fire station. Fire engines have not operated out of the facility since approximately 2002.

2.5 AREAS OF INTEREST

Areas of interest associated with use of AFFF during firefighting training exercises were identified through environmental sampling and analysis that confirmed releases to soil and/or groundwater at select locations and through interviews with EFR firefighting personnel, Messrs. Bob Butterfield and Kelly Revfem (Farallon 2016, 2018a). Details regarding the locations of firefighting training exercises, historical features at the training areas, and AFFF use, storage, and disposal were obtained during these interviews and reconnaissance of each area of interest. Releases of AFFF are suspected or confirmed at the following areas of interest (Figure 2):

- West Playfield at Issaquah Valley Elementary (West Playfield);
- Issaquah Valley Elementary East Ballfields (Dodd Fields Park);
- North of 190 East Sunset Way (Memorial Field);
- West of 135 East Sunset Way on the former rail grade (Rainier Trail); and
- 175 Newport Way Northwest.

In general, training exercises at areas of interest involved setting up AFFF application systems and practice by participants to produce an effective AFFF mixture at the hose nozzle. Farallon's understanding based on interviews with EFR firefighting personnel (Farallon 2016, 2018a) is that the foam mixtures were typical 3 percent solutions prior to 2002, after which reformulation of the AFFF concentrate allowed for more-diluted 1 percent solutions to be used. Typical volumes of AFFF concentrate used for training were on the order of one to three 5-gallon buckets per event, requiring between approximately 1,500 to 4,500 gallons of water; the resulting foam volume would have been considerably larger. Training exercises initially included practice with in-line induction systems to pull concentrate from buckets, and were later replaced by "around the pump" mixing systems incorporated into modern fire trucks.

During training exercises, AFFF was sprayed on the ground, vegetation, and adjacent buildings (including the Issaquah Valley Elementary gymnasium) and then was washed down with service water from fire hydrants at each training area. Equipment on fire trucks and hoses in contact with AFFF typically was washed off in the field at the end of the training event, and foam remaining in the training area was dispersed to the extent possible by spraying additional water on the area (Farallon 2016, 2018a).

Detailed descriptions of each area of interest, including historical information such as frequency of training event setup, product consumption, and footprint, are provided in Section 2.4, Areas of Interest, of the Work Plan. Summaries of historical information, descriptions of each area of interest, and site-specific geology and hydrogeology are provided below. Each area of interest's period of use for AFFF training, the frequency of the training, and the estimated total number of training events are provided in Table 3. Cross-sections for the West Playfield, Dodd Fields Park, Memorial Field, Rainier Trail, and 175 Newport Way Northwest are provided on Figures 4 through 8. Figures 9, 11, and 13 provide a plan view of each area of interest showing where the cross-section lines intersect across the surface. Boring logs and monitoring well construction details for work performed as part of the Study are provided in Appendix C.

2.5.1 West Playfield

The West Playfield comprises the southwestern portion of King County Parcel No. 2824069012 at 555 Northwest Holly Street in Issaquah, Washington (Figure 2).

2.5.1.1 Historical Use

Historical AFFF training was performed on the West Playfield (Figures 2 and 9) during the period from approximately the early 1970s through the early 1980s at a frequency of approximately once or twice per year. Typically, one to three 5-gallon buckets of AFFF concentrate were expended per training event. Exercises were conducted on the lawn proximate to the western wall of the Issaquah Valley Elementary gymnasium using service water from the southeast-adjacent fire hydrant. The ground surface in this area primarily is lawn that slopes slightly down to the east to a lower flat area of approximately 30 by 70 feet that includes a catch basin to capture surface runoff in this area. Areas potentially affected by historical training exercises are bordered by playground equipment surfaced in wood chips to the north; a fence, a ditch, and Newport Way Northwest to the west; the school gymnasium to the east; and a two-lane driveway granting access to the parking lot to the south.

2.5.1.2 Geology and Hydrogeology

Graphical cross-sections for the West Playfield are provided on Figures 4 and 5. Boring and monitoring well locations are presented on Figures 9 and 10. Boring logs from the field investigation are provided in Appendix C. Based on Study field observations by Farallon, the West Playfield is underlain by silty sand and silt to depths of approximately 15 to 25 feet bgs. The sand and silt mantle is underlain by well- to poorly graded coarse sands and gravels to the maximum depth explored of 30 feet bgs.

First-encountered groundwater is at a depth of approximately 10 feet bgs. Reconnaissance groundwater sampling in the sand and silt mantle indicates that the conductivity of this unit is variable. Due to insufficient yield, reconnaissance groundwater samples were not collected at borings IES-R01 and IES-R04. The underlying well- to poorly graded coarse sands and gravels exhibited consistent and higher groundwater yield during reconnaissance groundwater sampling. Based on groundwater gauging conducted in October 2018, shallow groundwater flows approximately to the north-northeast (Figure 10).

2.5.2 Dodd Fields Park

Dodd Fields Park comprises the southeastern portion of King County Parcel No. 2824069012 at 555 Northwest Holly Street in Issaquah, Washington (Figure 2).

2.5.2.1 Historical Use

Historical AFFF training was performed on Dodd Fields Park (Figures 2 and 9) during the period from approximately the early 1970s through the early 1980s on a similar schedule to the West Playfield at a frequency of approximately once or twice per year. Exercises were conducted on the lawn east of the driveway in an area previously described as blackberry bramble using service water from the southwest-adjacent fire hydrant (Figure 9). Typically, one to three 5-gallon buckets of AFFF concentrate was expended during each training event. Spraying of the AFFF mixture occurred in the vegetated area that is now a lawn with trees and likely extended onto land that is overlain by the present ballfields. The northern portion of the area where training occurred is generally flat with a modest slope to the north (less than 1 foot). No stormwater drainage system is present in this area. The southern portion of the area has localized relief up to 2 feet with an overall slope to the north.

Three groundwater monitoring wells, DF-MW01 through DF-MW03, previously were installed during a recent geotechnical study in the vicinity of Dodd Fields Park (Associated Earth Sciences Inc. 2018) (Figure 10). Monitoring wells DF-MW01 and DF-MW03 are located to the east and northeast of Dodd Fields Park. Monitoring well DF-MW02 is located in the central portion of the northern area, directly west of the southeastern corner of the Issaquah Valley Elementary school building and nearest to the fire hydrant. All three wells were confirmed to meet the minimum construction standards for resource protection wells described in WAC 173-160-400.

2.5.2.2 Geology and Hydrogeology

Graphical cross-sections for Dodd Fields Park are provided on Figures 4 and 5. Boring and monitoring well locations are presented on Figures 9 and 10. Boring logs from the field investigation are provided in Appendix C. Based on Study field observations by Farallon, Dodd Fields Park is underlain by lithology similar to the West Playfield. Silty sand and silt are present from the ground surface to depths of approximately 20 to 25 feet bgs. The sand and silt mantle is underlain by well- to poorly graded coarse sands and gravels to the maximum depth explored of 30 feet bgs.

First-encountered groundwater is at a depth of approximately 10 feet bgs. Groundwater recharge in the upper sand and silt mantle was adequate for reconnaissance groundwater sampling to be performed at a depth of 11 feet bgs in boring IES-R05. The underlying well- to poorly graded coarse sands and gravels exhibited consistently higher groundwater yield during reconnaissance groundwater sampling. Based on groundwater gauging conducted in October 2018, shallow groundwater flows approximately to the north-northeast (Figure 10).

2.5.3 Memorial Field

Memorial Field comprises the southern portion of King County Parcel No. 5279100070 north of 190 East Sunset Way in Issaquah, Washington (Figure 2).

2.5.3.1 Historical Use

Historical AFFF training was performed north of the fire station at 190 East Sunset Way on the southern portion of Memorial Field during the period from approximately the early 1980s through the mid-1990s at a frequency of approximately once or twice per year (Figures 2 and 11). Training exercises were similar to those performed at the West Playfield and Dodd Fields Park, and included setting up AFFF application systems and practice producing an effective AFFF mixture at the end of a 100- to 150-foot fire hose. AFFF was sprayed on the ground during exercises and then was washed down with service water from the fire hydrant on the southeastern corner of Memorial Field. Typically, one to three 5-gallon buckets of AFFF concentrate was expended during each training event.

An asphalt-paved parking lot is present north of the fire station at 190 East Sunset Way followed by a lawn with a number of trees, then a grass ballfield at Memorial Field. Memorial Field slopes slightly to the northwest, although precipitation on, and surface runoff onto, the field primarily infiltrates into the ground.

Previous sampling performed by the City of Issaquah in 2016 confirmed the presence of long-chain PFAS (nine carbons and above) in soil immediately north of the fire station at 190 East Sunset Way (City of Issaquah 2017). PFAS were not detected at concentrations exceeding the laboratory practical quantitation limit in the composite soil sample collected immediately north of the 190 East Sunset Way parking lot and south of the mature trees (City of Issaquah 2017). Information provided during interviews with EFR firefighting personnel suggests the composite soil sample collected in 2016 was not collected from the training area, which would have been the open field north of the treed area.

2.5.3.2 Geology and Hydrogeology

Graphical cross-sections for Memorial Field and Rainier Trail are provided on Figures 6 and 7. Boring and monitoring well locations are presented on Figures 11 and 12. Boring logs from the field investigation are provided in Appendix C. Based on Study field observations by Farallon, Memorial Field is underlain by silty sand and silt overlying gravel and sand with variable silt content to the maximum depth explored of 50 feet bgs.

First-encountered groundwater is at a depth of approximately 35 to 40 feet bgs. Based on groundwater elevation measurements collected in October 2018, groundwater flows to the north-northeast. Field observations during reconnaissance groundwater sampling and groundwater sampling from permanent monitoring wells indicate some seasonal variation in groundwater elevations at Memorial Field. Wet intervals at the approximate depth of first-encountered groundwater did not have adequate yield for sampling during August 2018 field sampling. However, adequate groundwater yield was reported for the monitoring wells screened across the previously observed wet intervals during subsequent October 2018 groundwater sampling from permanent monitoring wells.

2.5.4 Rainier Trail

Rainier Trail is on the central portion of King County Parcel No. 3424069043 west of 135 East Sunset Way on the former rail grade.

2.5.4.1 Historical Use

Historical AFFF training at Rainier Trail (Figures 2 and 11) occurred during the period from approximately the early 1970s through the early 1980s at a frequency of approximately once per year. Typically, one to three 5-gallon buckets of AFFF concentrate was expended during each training event. Service water was provided by the fire hydrant on the northeastern corner of the parking lot (Figure 11). During the period that training occurred, Rainier Trail was an abandoned rail grade with a gravel surface. This area was later redeveloped as parking with an irregular-shaped north-northwest to south-southeast landscaped median strip along the orientation of the railroad tracks and east-adjacent parking lot.

Previous sampling performed by the City of Issaquah in 2016 confirmed the presence of PFOA at a concentration of 0.00091 milligram per kilogram (mg/kg) in the soil sample collected from the landscaped area that bounds the western portion of the parking lot (City of Issaquah 2017). The Investigatory Level for protection of groundwater for unsaturated soil is 0.00044 mg/kg for PFOA in soil. More information on the basis for Investigatory Levels is presented in Section 2.7, Regulatory Criteria.

2.5.4.2 Geology and Hydrogeology

Graphical cross-sections at Memorial Field and Rainier Trail are provided on Figures 6 and 7. Boring and monitoring well locations are presented on Figures 11 and 12. Boring logs from the field investigation are provided in Appendix C. Based on Study field observations by Farallon, Rainier Trail is underlain by silty sand and silt overlying gravel and sand with variable silt content to the maximum depth explored of 40 feet bgs. Silt was encountered at approximately 37 feet bgs in boring RT-R01 and monitoring well RT-MW04.

First-encountered groundwater is at a depth of approximately 35 feet bgs. Based on groundwater elevation measurements collected in October 2018, shallow groundwater flows to the north. Seasonal fluctuations in groundwater elevation at the Rainier Trail appear to be less than those observed at Memorial Field based on the limited data set generated during the Study.

2.5.5 175 Newport Way Northwest

175 Newport Way Northwest is on King County Parcel No. 2824069165 at 175 Newport Way Northwest in Issaquah, Washington. This area of interest serves as the location of the current headquarters facility for EFR.

2.5.5.1 Historical Use

Historical AFFF training, including producing an effective AFFF mixture at the hose nozzle, and equipment cleaning and servicing were performed at 175 Newport Way

Northwest (Figure 2) during the period from approximately the early 1980s through the late 1990s at a frequency of up to 12 times per year. As described in Section 2.4, History of Firefighting Organizations in Lower Issaquah Valley, active fire station operations and AFFF training at the facility were reduced beginning in 1999, when the facility transitioned fully into serving as EFR’s administrative office and maintenance facility. Typically, one to three 5-gallon buckets of AFFF concentrate was expended during each training event. Training was performed at an area that currently is covered with lawn near the fire hydrant on the north-central portion of the property and at the western gravel-surfaced portion of the property. Some AFFF mixture may also have been sprayed at the base of the hillside west of the western property boundary

Residual AFFF associated with training exercises was washed down with service water on the property, some of which was captured by the property’s stormwater management system that routed water to a detention pond on the eastern portion of the property near Newport Way Northwest. Residual AFFF concentrate solution was disposed of from 175 Newport Way Northwest by a hazardous waste disposal contractor.

Soil sampling performed by the City of Issaquah with permission from EFR confirmed the presence of PFAS, including PFOA and PFOS, in soil at 175 Newport Way Northwest in the stormwater detention pond area and on the western portion of the property where historical training exercises occurred (Geosyntec Consultants, Inc. 2016). The highest reported concentration of a PFAS was PFOS at 1.3 mg/kg in a soil sample collected from the training area on the western portion of the property at a depth of 2.3 feet bgs. The lateral extent of PFAS in soil was not characterized as part of the investigation performed by the City of Issaquah at 175 Newport Way Northwest.

2.5.5.2 Geology and Hydrogeology

A graphical cross-section at 175 Newport Way is provided on Figure 8. Boring and monitoring well locations are presented on Figures 13 and 14. Boring logs from the field investigation are provided in Appendix C. Based on field observations by Farallon, 175 Newport Way is underlain by well- to poorly graded sands and gravels with variable silt content to the maximum depth explored of 40 feet bgs. Discontinuous silt beds ranging from approximately 5 to 10 feet thick were observed in borings and monitoring wells on the western and northern portions of the property (borings NWN-R01 and NWN-R02; monitoring wells NWN-MW03 and NWN-MW04). A continuous hard gray silt was observed under the training area on the western portion of 175 Newport Way Northwest from 23 feet bgs to the maximum depth explored of 40 feet bgs in boring NWN-R01 and monitoring well NWN-MW04. First-encountered groundwater is at a depth of approximately 15 to 18 feet bgs. Based on groundwater elevation measurements collected in October 2018, groundwater flows to the east.

2.6 SUMMARY OF PREVIOUS STUDIES AND EXISTING DATA

Characterization work performed prior to the Study includes monitoring of drinking water production wells COI-PW04 and COI-PW05; installation and sampling of monitoring wells COI-

MW01 through COI-MW07; and limited subsurface characterization performed at Memorial Field, Rainier Trail, and 175 Newport Way Northwest by the City of Issaquah.

Sampling for PFAS in groundwater pumped from the City of Issaquah production well COI-PW04 began in 2013 as part of the EPA Unregulated Contaminant Monitoring Rule sampling. PFAS, including PFOA and PFOS, were detected in groundwater samples at concentrations ranging from 0.00651 to 0.6 µg/l. Subsequent detections of PFOS concentrations in groundwater samples collected by the City of Issaquah from 2014 through 2018 ranged from 0.534 to 0.296 µg/l (Appendix B). Concentrations of PFOS in groundwater samples collected from production well COI-PW04 have declined slightly over time, although they continue to exceed the Investigatory Level. Concentrations of PFOA in groundwater samples collected from production well COI-PW04 have remained less than the Investigatory Level throughout the sampling period from 2013 through 2018 (Appendix B).

The City of Issaquah, with permission from EFR, previously performed limited characterization of portions of 175 Newport Way Northwest to investigate potential sources of PFAS in shallow and intermediate groundwater in the Lower Issaquah Valley. The City of Issaquah installed monitoring wells COI-MW01 through COI-MW07 in intermediate groundwater as part of this limited characterization work (Figure 2). These previous investigations have confirmed the release of PFAS to soil at 175 Newport Way Northwest. Reconnaissance and monitoring well groundwater sampling performed by the City of Issaquah has also identified a plume of PFAS-impacted shallow and intermediate groundwater extending north toward City of Issaquah production well COI-PW04. Additional monitoring for PFAS in groundwater at production well COI-PW04 continued on a monthly basis through 2018 (Appendix B). Additional sampling performed by the City of Issaquah in 2016 confirmed the presence of PFAS in soil at concentrations exceeding the Investigatory Level for protection of groundwater for unsaturated soil in the eastern portion of the Lower Issaquah Valley proximate to 190 East Sunset Way and west of 135 East Sunset Way (City of Issaquah 2017).

2.7 PARAMETERS OF INTEREST

Study parameters of interest for soil and groundwater include short-chain PFAS, long-chain PFAS, PFOS, and PFOA. Short-chain PFAS comprise PFAS with fully fluorinated tails that include seven or fewer carbons:

- Perfluorobutyl sulfonate;
- Perfluorohexanoic acid;
- Perfluorohexane sulfonic acid; and
- Perfluoroheptanoic acid.

Long-Chain PFAS comprise PFAS with fully fluorinated tails that included nine or more carbons:

- Perfluorononanoic acid;
- Perfluorodecanoic acid;

- Perfluoroundecanoic acid;
- Perfluorododecanoic acid;
- Perfluorotridecanoic acid; and
- Perfluorotetradecanoic acid.

The parameters of interest were included in the analyte list for Modified EPA Method 537 provided by ALS Environmental-Kelso of Kelso, Washington (ALS), which was selected for Study sample analysis. Soil and groundwater samples were analyzed for the parameters of interest by Modified EPA Method 537. EPA Method 537 is an EPA approved analytical method for finished drinking water. However, Modified EPA Method 537 is not a standardized analytical method for soil and/or groundwater and its performance should be further evaluated when a standardized method for both matrices is established by Washington State or EPA.

2.8 REGULATORY CRITERIA

PFAS are not currently regulated as hazardous substances under MTCA. For the Study, Ecology (2018a) has developed Investigatory Levels that include numerical criteria based on standard MTCA exposure scenarios for groundwater (drinking water scenario), unrestricted (residential) and industrial uses for soil (soil contact), and analyte concentrations in saturated and unsaturated soil for protection of groundwater (leaching from soil to groundwater) for PFOS and PFOA.

The Investigatory Level for PFOS, PFOA, and the sum of PFOS and PFOA concentrations in groundwater is 0.070 µg/l, based on the EPA lifetime Health Advisory Level. The Investigatory Level for PFOS, PFOA, and the sum of PFOS and PFOA concentrations in soil for unrestricted (residential) contact is 1.6 mg/kg. The Investigatory Level for PFOS, PFOA, and the sum of PFOS and PFOA concentrations in soil for industrial contact is 70 mg/kg.

The Investigatory Levels for PFOS and PFOA for protection of groundwater for unsaturated soil are 0.00088 and 0.00044 mg/kg, respectively. The Investigatory Levels for PFOS and PFOA for protection of groundwater for saturated soil are 0.000046 and 0.000028 mg/kg, respectively. The Investigatory Levels for protection of groundwater for saturated soil are less than current Modified EPA Method 537 reporting limits. Investigatory Levels for short-chain and long-chain PFAS were not developed for soil or groundwater.

Due to the chemical stability and long-term persistence of PFOS and PFOA in the environment, and the relatively low concentrations of PFOS and PFOA required to exceed Investigatory Levels for soil and groundwater, a future evaluation of background concentrations for soil and groundwater in up-gradient areas of the Lower Issaquah Valley may be appropriate. Similar to current requirements for listed hazardous substances, any future cleanup action would not be expected to remediate affected media to concentrations less than established regional background levels.

3.0 STUDY DESCRIPTION

This section presents the Study objectives identified in the Work Plan, characterization work performed at each area of interest and in the Lower Issaquah Valley, and deviations from the Work Plan that occurred during the field investigation.

3.1 STUDY OBJECTIVES

The overall purpose of the Study was to assess potential impacts of PFAS associated with AFFF training exercises to soil and groundwater in the Lower Issaquah Valley. Soil, reconnaissance groundwater, and groundwater samples were collected as part of the Study at, and down-gradient of, confirmed and/or suspected sources in areas of interest identified in the Lower Issaquah Valley. Specific Study objectives identified in the Work Plan included:

- Identify areas of interest where historical operations included use of AFFF to assess potential points of release of PFAS to the environment in the Lower Issaquah Valley;
- Investigate the presence of PFAS in vadose and/or saturated soil at suspected source areas and assess whether the quality of shallow groundwater at, and down-gradient of, areas of interest has been impacted by PFAS;
- Identify the occurrence of shallow groundwater-bearing zones and local gradients and groundwater flow direction at areas of interest where reconnaissance groundwater analytical results, or the analytical results of groundwater samples collected from existing monitoring points, suggest that shallow groundwater has been impacted by PFAS;
- Collect synoptic area-wide groundwater quality data from monitoring and production wells screened in intermediate groundwater-bearing zones to better characterize the distribution of PFAS across the Lower Issaquah Valley; and
- Compare soil and groundwater analytical results to Investigatory Levels for PFAS that were calculated by Ecology (2018a).

Data collected as part of the Study were not anticipated to fully characterize the nature and extent of all PFAS impacts to soil and groundwater in the Lower Issaquah Valley or at the areas of interest. The Parties understand additional characterization will be necessary at areas of interest and in the Lower Issaquah Valley to further characterize PFAS fate and transport and develop a complete conceptual site model.

At areas of interest where direct contact with surficial soil (at depths less than 6 inches bgs) was a potential exposure pathway, multi-incremental soil sampling decision units were identified for shallow soil based on historical uses in each area of interest, observed drainage patterns, and other features (i.e., areas capped by buildings, concrete sidewalks, or asphalt-paved parking lots or roads) that may have affected overall PFAS mass loading in soil.

Borings were located in, and down-gradient of, areas of interest to document the occurrence of shallow groundwater and to collect reconnaissance groundwater samples from discrete shallow groundwater-bearing zones. Reconnaissance groundwater sample analytical data were used to evaluate potential PFAS impacts in discrete shallow groundwater-bearing zones, and to identify the need for, and facilitate placement of, permanent shallow monitoring wells. Discrete soil samples were collected from borings in the vadose zone and/or fine-grained intervals in the saturated zone at suspected source areas to assess whether the quality of shallow groundwater at, and down-gradient of, areas of interest was impacted by PFAS.

Permanent shallow monitoring wells were installed to measure groundwater elevation, which was used to calculate groundwater flow direction at a local and regional scale. Groundwater sampling from permanent monitoring wells was used to evaluate potential PFAS impacts to groundwater. Soil, reconnaissance groundwater, and monitoring well groundwater sample analytical results were compared to Investigatory Levels to evaluate potential exposure pathways for individuals and migration pathways from soil to groundwater. Groundwater gauging and sampling from intermediate groundwater monitoring wells were performed to evaluate intermediate groundwater flow direction and water quality at a regional scale.

3.2 FIELD PROCEDURES

Field procedures applied for Study characterization work were identified and described in Section 4.0, Field Procedures, of the Work Plan prior to commencement of field sampling. With a limited number of exceptions, soil, reconnaissance groundwater, and monitoring well groundwater sampling and groundwater elevation measurements were collected in accordance with the Work Plan-identified field and standard operating procedures (SOPs). Deviations from the Work Plan that occurred during the course of field investigation activities are identified and described for each area of interest below.

3.3 STUDY SCOPE OF WORK

Characterization of PFAS in the Lower Issaquah Valley included multi-incremental sampling of shallow soil, soil and reconnaissance groundwater sampling from borings, and groundwater gauging and sampling from permanent monitoring wells. This section describes the work performed, any deviations from the Work Plan, and corrective actions taken at each area of interest.

3.3.1 West Playfield Area of Interest

Field characterization at the West Playfield area of interest included the following elements:

- Four borings, IES-R01 through IES-R04, were advanced for soil and/or reconnaissance groundwater sampling;
- Multi-incremental soil samples were collected from two decision units, DU-1A and DU-1B;
- Two discrete soil samples were collected from boring IES-R02; and
- Four permanent monitoring wells, IES-MW01 through IES-MW04, were installed for groundwater gauging and sampling.

Multi-incremental soil samples were collected to evaluate the direct contact pathway for shallow soil and potential impacts to groundwater associated with infiltration and downward transport through unsaturated soil. Borings IES-R01 through IES-R04 were advanced by Cascade Environmental, LP of Tacoma, Washington (Cascade) using a full-size sonic drill rig to a maximum depth of 30 feet bgs. Boring IES-R01 was advanced to evaluate up-gradient groundwater quality for the West Playfield and Dodd Fields Park areas of interest (Figure 9). Boring IES-R02 was drilled at a topographic low where overland flow was expected to collect following training exercises at the West Playfield to evaluate potential PFAS impacts to soil and groundwater. Borings IES-R03 and IES-R04 were drilled down-gradient of the West Playfield to evaluate potential impacts to groundwater (Figure 10).

Following completion of the borings and receipt of initial analytical results (see Section 4.0, Characterization Study Results), monitoring wells IES-MW01 through IES-MW04 were installed by Holt Services, Inc. of Puyallup, Washington (Holt) to a maximum depth of 30 feet bgs using a full-size sonic drill rig. The monitoring wells were screened into the conductive sand and/or gravel unit encountered between 15 and 20 feet bgs. The wells were gauged and sampled to evaluate groundwater flow direction and quality at the West Playfield area of interest and vicinity (Figure 10).

3.3.1.1 Soil Sampling

Soil sampling at the West Playfield included multi-incremental soil sampling at decision units DU-1A and DU-1B, and discrete soil sampling from boring IES-R02 (Figure 9). Multi-incremental soil sampling was performed in accordance with Farallon SOP SL-03, included in Appendix B of the Work Plan. Two discrete soil samples were collected from boring IES-R02 at depths of 12 and 23 feet bgs, respectively. Discrete soil samples were collected from borings and monitoring wells in accordance with Farallon SOP SL-01. Soil samples were placed on ice and delivered to ALS under standard chain-of-custody protocols for analysis for PFAS by Modified EPA Method 537.

3.3.1.2 Groundwater Sampling

Groundwater sampling at the West Playfield area of interest included collection of reconnaissance groundwater samples from borings IES-R01 through IES-R04 and groundwater samples from monitoring wells IES-MW01 through IES-MW04 (Figure 10). Reconnaissance groundwater sample collection was performed in accordance with the requirements of the Work Plan using EPA low-flow methodology. Insufficient groundwater was produced in the first-encountered groundwater at borings IES-R01 and IES-R04 to collect a shallow reconnaissance groundwater sample. Reconnaissance groundwater samples were collected at two depth intervals ranging from approximately 13.5 to 25 feet bgs in accordance with the Work Plan.

Monitoring wells IES-MW01 through IES-MW04 were constructed, developed, gauged, and sampled in accordance with the Work Plan and Farallon SOPs GW-01 through GW-04. Groundwater sampling included allowing for equilibration with the ambient atmosphere before gauging groundwater levels and purging monitoring wells until groundwater monitoring field parameters stabilized. The pump intake was placed in the center of the screened interval for all monitoring wells. Groundwater samples were placed on ice and delivered to ALS under standard chain-of-custody protocols for analysis for PFAS by Modified EPA Method 537.

3.3.1.3 Deviations from Work Plan and Corrective Actions

The following deviations from the Work Plan and corrective actions taken were documented for fieldwork performed at the West Playfield area of interest:

- Multi-incremental soil subsamples were collected with a stainless steel hand-coring device with an inside diameter of 1.37 inches that was decontaminated between each decision unit. The selected coring tool was narrower than the coring tool originally specified in the Work Plan, which called for a 2.5-inch-inside-diameter coring tool. In order to collect the target multi-incremental sample mass of 1,000 to 2,500 grams for each decision unit, the soil core segment removed from directly below the organic horizon was adjusted to 1 inch, equating to approximately 1,232 grams per composite multi-incremental sample. This sample mass falls within the target range identified in Farallon SOP SL-03.
- A limited number of the unique sample identifiers assigned to reconnaissance groundwater samples did not include the sample depth as indicated in the Work Plan. The sample depths were identified from the field notes using the time of collection and the sample identifiers were updated for reporting.
- Original monitoring well identifiers IES-MW01 through IES-MW04 were assigned to locations in the order drilled instead of matching reconnaissance boring numbering. The mis-numbered identifiers were flagged and corrected for reporting. Field notes were also annotated to reflect the change. Due to the timing of the correction, groundwater sample identifiers for monitoring wells IES-MW01 through IES-MW04 do not match the sample location identifier in the summary data tables.

3.3.2 Dodd Fields Park Area of Interest

Field characterization at the Dodd Fields Park area of interest included the following elements:

- Boring IES-R05 was advanced for soil and/or reconnaissance groundwater sampling;
- Multi-incremental soil samples were collected from two decision units, DU-2A and DU-2B;
- One discrete soil sample was collected using a hand auger proximate to existing monitoring well DF-MW02;
- Groundwater samples were collected from two existing shallow monitoring wells, DF-MW02 and DF-MW03; and
- An additional monitoring well, IES-MW05, was installed for groundwater gauging and sampling.

Multi-incremental soil samples were collected to evaluate the direct contact pathway for shallow soil and potential impacts to groundwater associated with infiltration and downward transport through unsaturated soil. Boring IES-R05 was advanced by Cascade using a full-size sonic drill rig to a maximum depth of 30 feet bgs to evaluate potential impacts to groundwater. Following completion of boring IES-R05 and receipt of initial analytical results (see Section 4.0, Characterization Study Results), monitoring well IES-MW05 was installed by Holt to a maximum depth of 30 feet bgs using a full-size sonic drill rig. The monitoring well was screened into the conductive sand and/or gravel unit encountered at 15 feet bgs. The well was gauged and sampled to evaluate groundwater flow direction and quality at the Dodd Fields Park area of interest and vicinity.

3.3.2.1 Soil

Soil sampling at Dodd Fields Park included multi-incremental soil sampling at decision units DU-2A and DU-2B, and discrete vadose zone soil sampling from hand-auger boring DF-R01 at a depth of 3.5 feet bgs (Figure 9). Multi-incremental soil sampling was performed in accordance with Farallon SOP SL-03, included in Appendix B of the Work Plan. Discrete soil samples were collected from borings and monitoring wells in accordance with Farallon SOP SL-01. Soil samples were placed on ice and delivered to ALS under standard chain-of-custody protocols for analysis for PFAS by Modified EPA Method 537.

3.3.2.2 Groundwater

Groundwater sampling at the Dodd Fields Park area of interest included collection of reconnaissance groundwater samples from boring IES-R05, groundwater samples from existing monitoring wells DF-MW02 and DF-MW03, and a groundwater sample from new monitoring well IES-MW05. Reconnaissance groundwater samples were collected from boring IES-R05 at depths of 11 and 28 feet bgs in accordance with the requirements of the Work Plan using EPA low-flow methodology.

Monitoring wells DF-MW02 and DF-MW03 were gauged and sampled on August 3, 2018. Both monitoring wells were sampled in accordance with the Work Plan and Farallon SOPs GW-03 and GW-04, including allowing for equilibration with the ambient atmosphere before gauging groundwater levels and purging monitoring wells until groundwater monitoring field parameters stabilized. The pump intake was placed at the top of the screened interval for monitoring well DF-MW02 and in the center of the screened interval for monitoring well DF-MW03.

A field duplicate groundwater sample was also collected from monitoring well DF-MW02 immediately following collection of the primary sample. Monitoring well IES-MW05 was constructed, developed, gauged, and sampled in accordance with the Work Plan and Farallon SOPs GW-01 through GW-04. The pump intake was placed in the center of the monitoring well IES-MW05 screened interval for sampling. Groundwater samples were placed on ice and delivered to ALS under standard chain-of-custody protocols for analysis for PFAS by Modified EPA Method 537.

3.3.2.3 Deviations from the Work Plan and Corrective Actions

The following deviations from the Work Plan and corrective actions taken were documented for fieldwork performed at the Dodd Fields Park area of interest:

- Original monitoring well identifier IES-MW05 was assigned to a monitoring well location in the order it was drilled instead of matching reconnaissance boring numbering. The mis-numbered identifier was flagged and corrected for reporting. Field notes were also annotated to reflect the change. Due to the timing of the correction, some groundwater sample identifiers for monitoring well IES-MW05 do not match the sample location identifier in the summary data tables.
- Five multi-incremental soil subsamples were repositioned in decision unit DU-2A due to access restrictions; all adjusted locations were 2 feet or less from their originally identified positions.

3.3.3 Memorial Field Area of Interest

Field characterization at the Memorial Field area of interest included the following elements:

- Four borings, MF-R01 through MF-R04, were advanced for soil and/or reconnaissance groundwater sampling;
- Multi-incremental soil samples were collected from decision unit DU-03;
- Two discrete soil samples were collected from boring MF-R01; and
- Three additional monitoring wells, MF-MW01 through MF-MW03, were installed for groundwater gauging and sampling.

Multi-incremental soil samples were collected to evaluate the direct contact pathway for shallow soil and potential impacts to groundwater associated with infiltration and downward transport through unsaturated soil. Borings MF-R01 through MF-R04 were advanced by Cascade using a full-size sonic drill rig to a maximum depth of 40 feet bgs (Figure 11). Boring MF-R01 was drilled to evaluate potential impacts to soil and groundwater within the approximate AFFF historical training area identified at Memorial Field. Borings MF-R02 through MF-R04 were drilled down-gradient of the AFFF training area to evaluate potential impacts to groundwater (Figure 12). Wet intervals were encountered in all four borings between depths of 30 and 35 feet bgs; however, these intervals did not produce adequate groundwater volume to collect reconnaissance groundwater samples at the time of drilling.

Based on the coarse granular lithology of the wet intervals observed in borings MF-R01 through MF-R04 and the presence of groundwater in existing up-gradient monitoring wells RT-MW01 and RT-MW03 at the time of drilling, monitoring wells MF-MW01 through MF-MW03 were installed by Holt with a full-size sonic drill rig to a maximum depth of 50 feet bgs. The monitoring wells were screened into the conductive sands and/or gravel unit encountered at approximately 30 to 35 feet bgs. The wells were gauged and sampled to evaluate groundwater flow direction and quality at the Memorial Field area of interest and vicinity (Figure 12).

3.3.3.1 Soil

Soil sampling at Memorial Field included multi-incremental soil sampling at decision unit DU-3, and discrete vadose zone soil sampling from boring MF-R01 at depths of 17 and 29 feet bgs (Figure 9). Multi-incremental soil sampling was performed in accordance with Farallon SOP SL-03, included in Appendix B of the Work Plan. Discrete soil samples were collected from boring MF-R01 in accordance with Farallon SOP SL-01. Soil samples were placed on ice and delivered to ALS under standard chain-of-custody protocols for analysis for PFAS by Modified EPA Method 537.

3.3.3.2 Groundwater

Groundwater sampling at the Memorial Field area of interest included collection of groundwater samples from new monitoring wells MF-MW01 through MF-MW03. Memorial Field monitoring wells were gauged and sampled on October 26, 2018. All Memorial Field monitoring wells were constructed, developed, gauged, and sampled in accordance with the Work Plan and Farallon SOPs GW-01 through GW-04. Groundwater sampling included allowing for equilibration with the ambient atmosphere before gauging groundwater levels and purging monitoring wells until groundwater monitoring field parameters stabilized. The pump intake was placed in the center of the screened interval for all monitoring wells. Groundwater samples were placed on ice and delivered to ALS under standard chain-of-custody protocols for analysis for PFAS by Modified EPA Method 537.

3.3.3.3 Deviations from the Work Plan and Corrective Actions

The following deviations from the Work Plan and corrective actions taken were documented for fieldwork performed at the Memorial Field area of interest:

- Due to the seasonal low groundwater conditions at the time borings were advanced at Memorial Field, reconnaissance groundwater samples were not collected from any of the borings. Permanent monitoring well screened intervals were selected based on observed wet intervals and subsurface lithology as described above.
- The location of one multi-incremental soil sample was moved approximately 7 feet from its original location due to access restrictions. The offset remained within the subsample's grid cell for decision unit DU-03.

No additional corrective action was required as part of soil and groundwater sampling at Memorial Field.

3.3.4 Rainier Trail Area of Interest

Field characterization at Rainier Trail area of interest included the following elements:

- Borings RT-R01 was advanced for soil and reconnaissance groundwater sampling;
- Multi-incremental soil samples were collected from decision unit DU-04;
- Two discrete soil samples were collected from boring RT-R01;

- Groundwater was gauged and sampled in three existing monitoring wells, RT-MW01, RT-MW-02, and RT-MW03; and
- An additional monitoring well, RT-MW04, was installed for groundwater gauging and sampling.

Multi-incremental soil samples were collected to evaluate the direct contact pathway for shallow soil and potential impacts to groundwater associated with infiltration and downward transport through unsaturated soil. Boring RT-R01 was advanced by Cascade using a full-size sonic drill rig to a maximum depth of 40 feet bgs (Figure 11). Boring RT-R01 was advanced to evaluate potential impacts to soil and groundwater as close as practicable to the AFFF historical training area identified at Rainier Trail. Existing monitoring wells RT-MW01 through RT-MW03, down-gradient of the AFFF training area, were sampled to evaluate potential impacts to groundwater (Figure 12).

Monitoring well RT-MW04 was installed by Holt with a full-size sonic drill rig to a maximum depth of 40 feet bgs. The monitoring well was screened into the conductive sand with gravel unit encountered at approximately 20 to 37 feet bgs. The well was gauged and sampled to evaluate groundwater flow direction and quality at the Rainier Trail area of interest and vicinity (Figure 12).

3.3.4.1 Soil

Soil sampling at Rainier Trail included multi-incremental soil sampling at decision unit DU-4, and discrete soil sampling from boring RT-R01 at depths of 17 and 36 feet bgs (Figure 11). Multi-incremental soil sampling was performed in accordance with Farallon SOP SL-03, included in Appendix B of the Work Plan. Discrete soil samples were collected from borings and monitoring wells in accordance with Farallon SOP SL-01. Soil samples were placed on ice and delivered to ALS under standard chain-of-custody protocols for analysis for PFAS by Modified EPA Method 537.

3.3.4.2 Groundwater

Groundwater sampling at the Rainier Trail area of interest included collection of a reconnaissance groundwater sample from boring RT-R01, groundwater samples from existing monitoring wells RT-MW01 and RT-MW03, and a groundwater sample from new monitoring well RT-MW04. The reconnaissance groundwater sample was collected from boring RT-R01 at a depth of 39 feet bgs in accordance with the requirements of the Work Plan using EPA low-flow methodology.

Existing monitoring wells RT-MW01 and RT-MW03 were gauged and sampled on August 3, 2018. Both monitoring wells were sampled in accordance with the Work Plan and Farallon SOPs GW-03 and GW-04, including allowing for equilibration with the ambient atmosphere before gauging groundwater levels and purging monitoring wells until groundwater monitoring field parameters stabilized. During the course of field sampling, Farallon discovered monitoring well RT-MW02 had previously been decommissioned; therefore, it was not sampled.

Monitoring well RT-MW01 was completely dewatered during initial purging prior to sampling. In accordance with Farallon SOP GW-04, Farallon allowed groundwater at the monitoring well to recharge and collected a groundwater sample once the pump inlet was submerged and adequate groundwater was present in the monitoring well to fill laboratory containers. Monitoring well RT-MW04 was sampled on October 26, 2018 in accordance with the Work Plan and Farallon SOPs. Groundwater samples were placed on ice and delivered to ALS under standard chain-of-custody protocols for analysis for PFAS by Modified EPA Method 537.

3.3.4.1 Deviations from the Work Plan and Corrective Actions

The following deviations from the Work Plan and corrective actions taken were documented for fieldwork performed at the Rainier Trail area of interest:

- Only one groundwater-bearing zone was encountered at boring RT-R01; therefore, only one reconnaissance groundwater sample was collected.
- Multiple obstructions, including trees, statues, park benches, and other permanently affixed objects, prevented multi-incremental soil subsample collection at the majority of the originally identified subsampling locations for decision unit DU-04. Farallon field staff relocated samples to the nearest sampling location practicable while maintaining uniform spatial coverage on the unpaved portions of the decision unit.
- Boring RT-R01 was relocated south of its originally identified location due to access restrictions. The final location is shown on Figure 12.

No additional corrective action was required as part of soil, reconnaissance groundwater, and groundwater sampling.

3.3.5 175 Newport Way Northwest Area of Interest

Field characterization at the 175 Newport Way Northwest area of interest included the following elements:

- Three borings, NWN-R01 through NWN-R03, were advanced for reconnaissance groundwater sampling;
- Multi-incremental soil samples were collected from two decision units, DU-05 and DU-06;
- Discrete soil samples were collected from monitoring wells NWN-MW02 through NWN-MW04; and
- Four monitoring wells, NWN-MW01 through NWN-MW04, were installed for groundwater gauging and sampling.

Multi-incremental soil samples were collected to evaluate the direct contact pathway for shallow soil and potential impacts to groundwater associated with infiltration and downward transport through unsaturated soil. Borings NWN-R01 through NWN-R03 were advanced by Cascade using a full-size sonic drill rig to a maximum depth of 40 feet bgs. Boring NWN-R01 was advanced to evaluate potential impacts to groundwater associated with the stormwater detention pond, which received AFFF training washdown water, on the eastern portion of the 175 Newport Way Northwest area of interest. Boring NWN-R02 was advanced to evaluate potential impacts to groundwater associated with training exercises performed at decision unit DU-05 on the northern boundary of the area of interest. Boring NWN-R03 was advanced to evaluated potential impacts to groundwater associated with training exercises performed on the western portion of the area of interest where previous soil sampling was performed by the City of Issaquah.

Monitoring wells NWN-01 through NWN-MW04 were installed by Holt with a full-size sonic drill rig to a maximum depth of 30 feet bgs. All monitoring wells were screened into the sand and/or gravel units encountered at approximately 10 to 15 feet bgs. The wells were gauged and sampled to evaluate groundwater flow direction and quality associated with 175 Newport Way Northwest.

3.3.5.1 Soil

Soil sampling at 175 Newport Way Northwest included multi-incremental soil sampling at decision units DU-5 and DU-6, and discrete soil sampling from monitoring wells NWN-MW02 through NWN-MW04 at depths ranging from 5 to 25 feet bgs. Multi-incremental soil sampling was performed in accordance with Farallon SOP SL-03, included in Appendix B of the Work Plan. Discrete samples were collected from borings and monitoring wells in accordance with Farallon SOP SL-01. Soil samples were placed on ice and delivered to ALS under standard chain-of-custody protocols for analysis for PFAS by Modified EPA Method 537.

3.3.5.2 Groundwater

Groundwater sampling at the 175 Newport Way Northwest area of interest included collection of reconnaissance groundwater samples from borings NWN-R01 through NWN-R03 and groundwater samples from new monitoring wells NWN-MW01 through NWN-MW04. Reconnaissance groundwater sample collection was performed in accordance with the requirements of the Work Plan using EPA low-flow methodology. Reconnaissance groundwater samples were collected at depths ranging from approximately 19 to 39 feet bgs in accordance with the Work Plan.

New monitoring wells NWN-MW01 through NWN-MW04 were constructed, developed, gauged, and sampled in accordance with the Work Plan and Farallon SOPs GW-01 through GW-04. Groundwater sampling included allowing for equilibration with the ambient atmosphere before gauging groundwater levels and purging monitoring wells until groundwater monitoring field parameters stabilized. The pump intake was placed in the center of the screened interval for all monitoring wells. Groundwater samples were placed on ice and delivered to ALS under standard chain-of-custody protocols for analysis for PFAS by Modified EPA Method 537.

3.3.5.3 Deviations from the Work Plan and Corrective Actions

The following deviations from the Work Plan and corrective actions taken were documented for fieldwork performed at the 175 Newport Way Northwest area of interest:

- Borings NWN-R01 and NWN-R02 were repositioned to the south from their original locations due to access restrictions;
- Only one shallow groundwater-bearing zone was encountered in borings NWN-R01 and NWN-R02 before encountering the hard, low-permeability silt; therefore, only one reconnaissance groundwater sample was collected from each boring; and
- Monitoring well NWN-MW02 was repositioned to the north from its original location due to access restrictions and overhead power-line clearance requirements.

3.3.6 Lower Issaquah Valley Groundwater

Area-wide groundwater sampling was performed for the monitoring wells previously installed by the City of Issaquah, including monitoring wells COI-MW02 through COI-MW07, which are screened in intermediate groundwater from depths between approximately 70 to 110 feet bgs (Table 1). Groundwater sampling was performed on October 24 and 25, 2018 in accordance with Farallon SOPs GW-03 and GW-04, included in Appendix B of the Work Plan. Groundwater sampling included allowing for equilibration with the ambient atmosphere before gauging groundwater levels and purging monitoring wells until groundwater monitoring field parameters stabilized. The pump intake was placed in the center of the screened interval for all monitoring wells.

3.3.6.1 Deviations from the Work Plan and Corrective Actions

No corrective action was required as part of area-wide groundwater sampling.

3.3.7 Quality Assurance and Quality Control Samples

In accordance with the Work Plan, Farallon collected quality control samples that included field blanks, rinsate blanks for equipment that came into contact with soil and groundwater, and trip blanks that traveled with each cooler during sample collection and transport. The quality control samples were collected using standard methods and included:

- A field blank collected at the 175 Newport Way Northwest area of interest by transferring laboratory-certified PFAS-free water from one container to another at the field sampling site;
- Rinsate blanks for decontaminated sampling equipment, including the stainless steel sample coring tool used for multi-incremental soil sampling, the decontaminated sonic core barrel, disposable sonic core sample bags, disposable nitrile gloves used to handle samples, and the pump tubing assembly used to collect groundwater samples; and
- Trip blanks that traveled with each cooler during sample collection and transport to the laboratory.

Field split soil samples and field duplicate groundwater samples were also collected from select locations at a rate of one quality control sample for every 10 samples collected as specified in the Work Plan. A field duplicate was not collected for the multi-incremental soil samples. Quality control samples were shipped to ALS under standard chain-of-custody protocols for analysis for PFAS by Modified EPA Method 537.

3.4 INVESTIGATION-DERIVED WASTE

Excess soil cuttings, decontamination water, and other wastewater generated during the investigation were temporarily placed in 55-gallon drums stored at the Issaquah Valley Elementary and 175 Newport Way Northwest properties pending profiling based on soil analytical results. Farallon observed removal of the investigation-derived waste by Stericycle Environmental Solutions, Inc. of Kent, Washington on October 29, 2018 for permanent disposal at a licensed facility.

4.0 STUDY RESULTS

Study soil, reconnaissance groundwater, and monitoring well groundwater sampling analytical results for each area of interest are presented below. Analytical results are presented on Figures 9 through 16 and in Tables 4 through 11. Complete laboratory analytical reports are provided in Appendix D. Full-size American National Standards Institute D-size figures are provided in Appendix E.

4.1 WEST PLAYFIELD AREA OF INTEREST

PFAS, including PFOS and PFOA, were detected in shallow soil, vadose zone soil, reconnaissance groundwater, and groundwater samples collected from the West Playfield area of interest. Analytical results are summarized below.

4.1.1 Soil

PFOS, PFOA, and the sum of PFOS and PFOA concentrations in shallow soil for the multi-incremental soil samples collected from decision units DU-1A and DU-1B were less than the Investigatory Level for unrestricted (residential) contact of 1.6 mg/kg (Table 5). PFOA was detected at concentrations of 0.0011 and 0.00053 mg/kg in the multi-incremental soil samples collected from decision units DU-1A and DU-1B, respectively (Table 5). PFOS was detected at concentrations of 0.0028 and 0.0024 mg/kg in the multi-incremental soil samples collected from decision units DU-1A and DU-1B, respectively. PFOA and PFOS concentrations detected in the soil samples collected from decision units DU-1A and DU-1B exceed Investigatory Levels for protection of groundwater for unsaturated soil (Table 5). PFOS was also detected at a concentration of 0.00055 mg/kg in the discrete saturated soil sample collected from boring IES-R02 at a depth of 23 feet bgs, which exceeds the Investigatory Levels for protection of groundwater for saturated soil.

Short-chain PFAS were detected in soil samples collected from decision units DU-1A and DU-1B and discrete soil samples collected from boring IES-R02[3] (Table 4). Short-chain PFAS were detected at concentrations ranging from 0.00017 to 0.00072 mg/kg. Long-chain PFAS were detected at concentrations ranging from 0.0003 to 0.0015 mg/kg (Table 5). Long-chain PFAS were reported non-detect at the laboratory method reporting limit (MRL) in both discrete soil samples collected from boring IES-R02. Investigatory Levels have not been established for short-chain or long-chain PFAS in soil.

4.1.2 Groundwater

Shallow groundwater at the West Playfield area of interest was first encountered at depths ranging from 9 feet bgs (borings IES-R04) to 12 feet bgs (boring IES-R02). The first-encountered groundwater-bearing zone comprises a silty sand and silt unit overlying coarse gravel and sand to

[3] Concentrations of short-chain and long-chain PFAS are summarized as the minimum and maximum values for individual substances from each PFAS group. Reported concentrations of individual analytes are provided in summary Tables 4 through 8.

the maximum depth explored (Figures 4 and 5). Poor yield during reconnaissance groundwater sampling from borings IES-R01 and IES-R04 was likely due to the high silt content in the first-encountered wet interval. Adequate yield for sampling in the first-encountered groundwater-bearing zone in boring IES-R02 was in a poorly graded sand. First-encountered reconnaissance groundwater sampling at boring IES-R03 was performed in a silt that directly overlies coarse gravel and sand at a depth of 21 feet bgs. Groundwater elevations increased by 13 feet in boring IES-R01 and approximately 5 feet in boring IES-R04 when the borings encountered the underlying coarse gravel and sands, suggesting that the silty sand and silt mantle at the West Playfield is creating semi-confining conditions for shallow groundwater.

Static groundwater levels at the West Playfield area of interest monitoring wells ranged from 6.79 to 7.74 feet below the monitoring well top-of-casing at the flush-mounted completed well monument, which equates to groundwater elevations of 65.64 feet NAVD88 (monitoring well IES-MW04) to 68.79 feet NAVD88 (monitoring well IES-MW01). The groundwater gradient was 0.005 foot per foot to the northwest (Figure 10). There are no monitoring wells screened in the intermediate groundwater interval at the West Playfield or Dodd Fields Park areas of interest so the vertical gradient between the shallow and intermediate groundwater intervals could not be assessed. However, comparison of groundwater levels measured at monitoring wells COI-MW05 and COI-MW06 screened in intermediate groundwater to the north and south of the West Playfield area of interest to groundwater levels measured at monitoring wells screened in the shallow groundwater interval at West Playfield and Dodd Fields Park areas of interest suggest a downward vertical gradient between shallow and intermediate groundwater for at least some of the well locations. In October 2018, groundwater elevations observed at monitoring wells IES-MW01, IES-MW03, and IES-MW04 screened in shallow groundwater ranged from 1.11 to 1.83 feet higher than groundwater elevations observed in intermediate wells COI-MW05 and COI-MW06 (Table 2).

PFOS was detected at concentrations exceeding the Investigatory Level of 0.070 µg/l in reconnaissance groundwater samples collected from borings IES-R01 through IES-R04 (Table 7). PFOA was detected at concentrations less than the Investigatory Level in all reconnaissance groundwater samples (Table 7). The maximum PFOS concentration reported was 0.72 µg/l in the reconnaissance groundwater sample collected from boring IES-R02 at a depth of 25 feet bgs, directly below decision unit DU-1A and the area of suspected high mass loading for PFAS associated with historical AFFF training exercises and associated surface runoff. Short-chain PFAS were detected at concentrations ranging from 0.0022 to 0.36 µg/l in the reconnaissance groundwater samples collected from borings IES-R01 through IES-R04 (Table 6). Long-chain PFAS were detected at concentrations ranging from 0.00033 to 0.034 µg/l in the groundwater samples collected from the same borings (Table 7).

PFOS was detected at concentrations exceeding the Investigatory Level of 0.070 µg/l in groundwater samples collected from monitoring wells IES-MW01 through IES-MW04 (Table 9). PFOA was detected at concentrations less than the Investigatory Level in the same groundwater samples (Table 9). The maximum reported PFOS concentration in groundwater was 0.53 µg/l in the groundwater sample collected from monitoring well IES-MW04 at a depth of 20 feet bgs. PFOS was detected at a concentration of 0.24 µg/l in the groundwater sample collected from monitoring well IES-MW02 at a depth of 20 feet bgs, southwest-adjacent to the reconnaissance groundwater sample collected from boring IES-R02 with a reported PFOS concentration of 0.72 µg/l at a depth of 25 feet bgs (Table 7).

Short-chain PFAS were detected at concentrations ranging from 0.0014 to 0.26 µg/l in the groundwater samples collected from monitoring wells IES-MW01 through IES-MW04 (Table 8). Long-chain PFAS were detected at concentrations ranging from 0.00065 to 0.022 µg/l in the groundwater samples collected from the same monitoring wells (Table 9). Investigatory Levels have not been established for short-chain and long-chain PFAS in groundwater.

4.2 DODD FIELDS PARK AREA OF INTEREST

PFAS, including PFOS and PFOA, were detected in shallow soil, vadose zone soil, reconnaissance groundwater, and groundwater samples collected from the Dodd Fields Park area of interest. Analytical results are summarized below.

4.2.1 Soil

PFOS, PFOA, and the sum of PFOS and PFOA concentrations in shallow soil for the multi-incremental soil samples collected from decision units DU-2A and DU-2B were less than the Investigatory Level for unrestricted (residential) contact (Table 5; Figure 9). PFOA was detected at a concentration of 0.00094 mg/kg, exceeding the Investigatory Level for protection of groundwater for unsaturated soil of 0.00044 mg/kg, in the multi-incremental soil sample collected from decision unit DU-2A (Table 5; Figure 9). PFOA was detected at concentrations less than Investigatory Levels in the multi-incremental soil sample collected from decision unit DU-2B and the soil sample collected from boring DF-R01 at a depth of 3.5 feet bgs.

PFOS was detected at concentrations of 0.085 and 0.016 mg/kg in the multi-incremental soil samples collected from decision units DU-2A and DU-2B, respectively (Table 5). PFOS was detected at a concentration of 0.043 mg/kg in the soil sample collected from boring DF-R01 at a depth of 3.5 feet bgs. All reported PFOS concentrations in soil samples collected from the Dodd Fields Park area of interest exceed the Investigatory Level for protection of groundwater for unsaturated soil of 0.00088 mg/kg.

Short-chain and long-chain PFAS were detected in soil samples collected from decision units DU-2A and DU-2B and the vadose zone soil sample collected from boring DF-R01 (Table 4). Short-chain PFAS were detected at concentrations ranging from 0.00026 to 0.0036 mg/kg. Long-chain PFAS were detected at concentrations ranging from 0.00022 to 0.021 mg/kg (Table 5).

4.2.2 Groundwater

Shallow groundwater at the Dodd Fields Park area of interest was first encountered at depths ranging from 9 feet bgs (borings IES-R05) to 23 feet bgs (boring MF-MW03). The first-encountered groundwater-bearing zone comprises silty sand and silt unit overlying coarse gravel and sand to the maximum depth explored of 31.5 feet bgs (Figures 4 and 5). First-encountered reconnaissance groundwater sampling at boring IES-R05 was performed in poorly graded sand with silt at a depth of 11 feet bgs. Groundwater elevation increased by approximately 1 foot in boring IES-R05 when the boring encountered the underlying coarse gravel and sands at a depth of 25 feet bgs. Associated Earth Sciences Inc. (2018) (Appendix F) observed an increase in groundwater elevation of approximately 10 feet during drilling monitoring well DF-MW02 when drilling reached poorly graded sand at a depth of approximately 15 feet bgs. Both observations suggest that the silty sand and silt mantle behaves similarly at the Dodd Fields Park area of interest to at the West Playfield area of interest and is creating semi-confining conditions for shallow groundwater.

Static groundwater levels at the Dodd Fields Park area of interest monitoring wells ranged from 8.10 to 10.99 feet below the monitoring well top-of-casing at the flush-mounted completed well monument, which equates to groundwater elevations of 62.58 feet NAVD88 (monitoring well IES-MW05) to 66.72 feet NAVD88 (monitoring well DF-MW01). The groundwater gradient was 0.007 foot per foot to the northeast (Figure 10). There are no monitoring wells screened in the intermediate groundwater interval at the West Playfield or Dodd Fields Park areas of interest, so the vertical gradient between the shallow and intermediate groundwater intervals could not be assessed.

PFOS was detected at a concentration of 0.51 µg/l, exceeding the Investigatory Level of 0.070 µg/l, in the reconnaissance groundwater sample collected from boring IES-R05 at a depth of 28 feet bgs (Table 7). PFOS was detected at a concentration of 0.028 µg/l, less than the Investigatory Level of 0.070 µg/l, in the reconnaissance groundwater sample collected from boring IES-R05 at a depth of 11 feet bgs (Table 7). PFOA was detected at concentrations less than the Investigatory Level in all reconnaissance groundwater samples collected from boring IES-R05. The maximum PFOS concentration reported was 0.51 µg/l in the reconnaissance groundwater sample collected from boring IES-R05 at a depth of 28 feet bgs, approximately down-gradient of the area of high suspected mass loading for PFAS associated with historical AFFF training exercises at Dodd Fields Park and associated surface runoff.

Short-chain PFAS were detected at concentrations ranging from 0.0017 to 0.20 µg/l in the reconnaissance groundwater samples collected from boring IES-R05 (Table 6). Long-chain PFAS were detected at concentrations ranging from 0.0012 to 0.04 µg/l in the groundwater samples collected from the same boring (Table 7).

PFOS was detected at concentrations exceeding the Investigatory Level of 0.070 µg/l in groundwater samples collected from monitoring wells DF-MW02, DF-MW03, IES-MW04, and IES-MW05 (Table 9). PFOA was detected at concentrations less than the Investigatory Level in the same groundwater samples. The maximum PFOS concentration reported was 0.55 µg/l in a groundwater sample collected from monitoring well DF-MW02 at a depth of 17 feet bgs (Table 9). The reported concentration of PFOS in the groundwater sample collected from down-gradient monitoring well IES-MW05 of 0.38 µg/l was higher than the concentrations reported for cross-gradient monitoring well DF-MW03 to the east, suggesting groundwater impacts decline east of the Dodd Fields Park AFFF training area (Table 9; Figure 10).

Short-chain PFAS were detected at concentrations ranging from 0.0028 to 0.23 µg/l in the groundwater samples collected from monitoring wells DF-MW02, DF-MW03, and IES-MW05 (Table 8). Long-chain PFAS were detected at concentrations ranging from 0.00073 to 0.033 µg/l in the groundwater samples collected from the same monitoring wells (Table 9; Figure 10).

4.3 MEMORIAL FIELD AREA OF INTEREST

PFAS, including PFOS and PFOA, were detected in shallow soil, vadose zone soil, and groundwater samples collected from the Memorial Field area of interest. Analytical results are summarized below.

4.3.1 Soil

PFOS, PFOA, and the sum of PFOS and PFOA concentrations in shallow soil for the multi-incremental soil sample collected from decision unit DU-3 were less than the Investigatory Level for unrestricted (residential) contact (Table 5; Figure 11). PFOA and PFOS concentrations of 0.0010 and 0.014 mg/kg, respectively, detected in the multi-incremental soil sample collected from decision unit DU-03 exceeded Investigatory Levels for protection of groundwater for unsaturated soil (Table 5). PFOA was reported non-detect at the laboratory MRL in the discrete vadose zone soil samples collected from boring MF-R01 at depths of 17 and 29 feet bgs. PFOS was detected at concentrations of 0.0017 and 0.0011 mg/kg in discrete vadose zone soil samples collected from boring MF-R01 at the same depths. All reported PFOS concentrations in soil samples collected from the Memorial Field area of interest exceed the Investigatory Level for protection of groundwater for unsaturated soil of 0.00088 mg/kg (Table 5).

Short-chain and long-chain PFAS were detected in the soil sample collected from decision unit DU-03 and vadose soil samples collected from boring MF-R01 (Tables 4 and 5). Short-chain PFAS were detected at concentrations ranging from 0.00017 to 0.0020 mg/kg (Table 4). Long-chain PFAS were detected at concentrations ranging from 0.00033 to 0.033 mg/kg (Table 5).

4.3.2 Groundwater

Shallow groundwater at the Memorial Field area of interest was first encountered at depths ranging from 30 feet bgs (borings MF-R01) to 41 feet bgs (boring MF-MW03). The first-encountered groundwater-bearing zone comprises well-graded gravels and sands to the maximum depth explored of 50 feet bgs (Figures 6 and 7). Wet strata encountered between 30 and 35 feet bgs while drilling reconnaissance borings in August 2018 did not yield adequate water for sampling in any borings; however, installation of monitoring wells with screens in the same strata (Table 1) in October 2018 yielded adequate water to develop, purge, and sample monitoring wells MF-MW01 through MF-MW03. The change in groundwater yield within the same stratigraphic interval indicates groundwater elevations fluctuate seasonally in the Memorial Field area of interest.

Static groundwater levels at the Memorial Field monitoring wells ranged from 32.06 to 36.80 feet below the monitoring well top-of-casing at the flush-mounted completed well monument, which equates to groundwater elevations of 67.37 feet NAVD88 (monitoring well MF-MW03) to 67.53 feet NAVD88 (monitoring well MF-MW01). The groundwater gradient was 0.0016 foot per foot to the northeast (Figure 12). There are no monitoring wells screened in the intermediate groundwater interval at the Memorial Field area of interest, so the vertical gradient between the shallow and intermediate groundwater intervals could not be assessed.

Neither PFOA nor PFOS were detected at a concentration exceeding the Investigatory Level of 0.070 µg/l in the groundwater samples collected from monitoring wells MF-MW01 through MF-MW03 (Table 9; Figure 12). The maximum reported PFOS concentration in groundwater was 0.054 µg/l in a groundwater sample collected from monitoring well MF-MW02 at a depth of 36 feet bgs. The sum of PFOA and PFOS concentrations in groundwater samples collected from monitoring well MF-MW02 was 0.0575 µg/l, slightly less than the Investigatory Level of 0.070 µg/l for the sum of PFOA and PFOS.

Short-chain PFAS were detected at concentrations ranging from 0.00090 to 0.032 µg/l in the groundwater samples collected from monitoring wells MF-MW01 through MF-MW03 (Table 7). Long-chain PFAS were detected at concentrations ranging from 0.00059 to 0.026 µg/l in the groundwater samples collected from the same monitoring wells (Table 9; Figure 12).

4.4 RAINIER TRAIL AREA OF INTEREST

PFAS, including PFOS and PFOA, were detected in shallow soil, reconnaissance groundwater, and groundwater samples collected from the Rainier Trail area of interest. Analytical results are summarized below.

4.4.1 Soil

PFOS, PFOA, and the sum of PFOS and PFOA concentrations in shallow soil for the multi-incremental soil sample collected from decision unit DU-04 were less than the Investigatory Level for unrestricted (residential) contact of 1.6 mg/kg (Table 5; Figure 11). PFOA and PFOS were detected at concentrations of 0.00045 and 0.0018 mg/kg, respectively (Table 5). The reported concentration of PFOA slightly exceeds the Investigatory Level for the protection of groundwater for unsaturated soil of 0.00044 mg/kg. The reported concentration of PFOS exceeds the Investigatory Level for protection of groundwater for unsaturated soil of 0.00088 mg/kg.

Short-chain and long-chain PFAS were detected in the multi-incremental soil sample collected from decision unit DU-04 (Tables 4 and 5). Short-chain PFAS were detected at concentrations ranging from 0.00024 to 0.00038 mg/kg (Table 4). Long-chain PFAS were detected at concentrations ranging from 0.00031 to 0.00076 mg/kg (Table 5). Both short-chain and long-chain PFAS were reported non-detect at the laboratory MRL in the discrete soil samples collected from boring RT-R01 at depths of 17 and 36 feet bgs (Tables 4 and 5).

4.4.2 Groundwater

Shallow groundwater at the Rainier Trail area of interest was first encountered at depths ranging from 33 feet bgs (monitoring well RT-MW04) to 36 feet bgs (boring RT-R01). The first-encountered groundwater-bearing zone comprises well-graded sands and gravels to the maximum depth explored of 46 feet bgs (Figures 6 and 7). Recharge during reconnaissance groundwater sampling at boring RT-R01 was approximately 350 milliliters per minute, and remained just above the pump intake during reconnaissance groundwater sampling at a depth of 42 feet bgs.

Static groundwater levels at the Rainier Trail area of interest monitoring wells ranged from 31.08 to 31.47 feet below the monitoring well top-of-casing at the flush-mounted completed well monument, which equates to groundwater elevations of 67.59 feet NAVD88 (monitoring wells RT-MW01 and RT-MW03) to 69.31 feet NAVD88 (monitoring well RT-MW04). The groundwater gradient was 0.003 foot per foot to the north (Figure 12). There are no monitoring wells screened in the intermediate groundwater interval at the Rainier Trail area of interest, so the vertical gradient between the shallow and intermediate groundwater intervals could not be assessed.

PFOA and PFOS were detected at concentrations of 0.0098 and 0.010 µg/l, respectively, in the reconnaissance groundwater sample collected from boring RT-R01 (Table 7; Figure 12). The sum of PFOA and PFOS concentrations in the reconnaissance groundwater sample collected from boring RT-R01 was 0.0198 µg/l, less than the Investigatory Level of 0.070 µg/l. Short-chain PFAS were detected at concentrations ranging from 0.0024 to 0.0046 µg/l in the reconnaissance groundwater sample collected from boring RT-R01 at a depth of 39 feet bgs (Table 6). The long-chain PFAS perfluorononanoic acid was detected at a concentration of 0.0021 µg/l in the reconnaissance groundwater sample collected from the same boring (Table 7).

PFOS and PFOA were detected at concentrations less than Investigatory Level of 0.070 µg/l in the groundwater samples collected from monitoring wells RT-MW01, RT-MW03, and RT-MW04 (Table 9; Figure 12). The maximum reported PFOA and PFOS concentrations in groundwater were 0.015 and 0.053 µg/l, respectively, in the groundwater sample collected from monitoring well RT-MW01 at a depth of 40 feet bgs (Table 9; Figure 12). Monitoring well RT-MW01 is down-gradient of the Rainier Trail AFFF training area. The sum of PFOA and PFOS concentrations in groundwater samples collected from monitoring well RT-MW01 was 0.068 µg/l, slightly less than the Investigatory Level of 0.070 µg/l. PFOA and PFOS concentrations and the combined concentration of PFOA and PFOS are lower to the east in monitoring well RT-MW03, and in up-gradient monitoring well RT-MW04 (Figure 12).

Short-chain PFAS were detected at concentrations ranging from 0.00098 to 0.032 µg/l in the groundwater samples collected from monitoring wells RT-MW01, RT-MW03, and RT-MW04 (Table 8). Long-chain PFAS were detected at concentrations ranging from 0.00040 to 0.0083 µg/l in the groundwater samples collected from the same monitoring wells (Table 9; Figure 12).

4.5 175 NEWPORT WAY NORTHWEST AREA OF INTEREST

PFAS, including PFOS and PFOA, were detected in shallow soil, vadose soil, reconnaissance groundwater, and groundwater samples collected from the 175 Newport Way Northwest area of interest. Analytical results are summarized below.

4.5.1 Soil

PFOS, PFOA, and the sum of PFOS and PFOA concentrations in shallow soil for the multi-incremental soil samples collected from decision units DU-05 and DU-06 were less than the Investigatory Level for unrestricted (residential) contact of 1.6 mg/kg (Table 5; Figure 13). PFOA and PFOS concentrations in the multi-incremental soil samples collected from decision units DU-05 and DU-06 exceeded Investigatory Levels for protection of groundwater for unsaturated soil.

The PFOA concentration of 0.0017 mg/kg detected in the discrete vadose zone soil sample collected from monitoring well NWN-MW04 at depth of 5 feet bgs exceeded the Investigatory Level for protection of groundwater for unsaturated soil of 0.00044 mg/kg (Table 5; Figure 13). PFOA concentrations detected in discrete vadose zone soil samples collected from monitoring wells NWN-MW02 and NWN-MW03 were less than the Investigatory Level for protection of groundwater for unsaturated soil. PFOS was detected at concentrations ranging from 0.0064 to 0.088 mg/kg in the discrete vadose zone soil samples collected from monitoring wells NWN-MW02 through NWN-MW04 at depths ranging from 5 to 25 feet bgs (Table 5; Figure 13). PFOS was reported non-detect at the laboratory MRL in the soil sample collected from monitoring well NWN-MW02 at a depth of 10 feet bgs. All reported concentrations of PFOS in discrete vadose zone soil samples collected from monitoring wells NWN-MW02 through NWN-MW04 exceed the Investigatory Level for protection of groundwater for unsaturated soil.

Short-chain and long-chain PFAS were detected in soil samples collected from decision units DU-05 and DU-06 and discrete vadose zone soil samples collected from monitoring wells NWN-MW02 through NWN-MW04. Short-chain PFAS were detected at concentrations ranging from 0.00019 to 0.0061 mg/kg (Table 4). Long-chain PFAS were detected at concentrations ranging from 0.00023 to 0.0039 mg/kg (Table 5).

4.5.2 Groundwater

Shallow groundwater at 175 Newport Way Northwest was first encountered at depths ranging from 15 feet bgs (boring NWN-R01 and monitoring well NWN-MW04) to 26 feet bgs (boring NWN-R03 and monitoring well NWN-MW03). The first-encountered groundwater-bearing zone comprises sand and gravel to the maximum depth explored of 40 feet bgs (Figure 7). Groundwater elevations increased by approximately 2 feet from 27 to 25 feet bgs during reconnaissance groundwater sampling when the boring encountered the well-graded sands and gravel below 35 feet bgs, suggesting that the overlying sand and gravel is creating semi-confining conditions for shallow groundwater at this location. First-encountered groundwater in borings NWN-R01 and NWN-R02 did not rise after the boring encountered a hard gray silt, interpreted to be bedrock, between 23 and 30 feet bgs. First-encountered groundwater in borings NWN-R01 and NWN-R02 remained static during reconnaissance groundwater sampling.

Static groundwater levels at the 175 Newport Way Northwest area of interest monitoring wells ranged from 13.20 to 22.77 feet below the monitoring well top-of-casing at the flush-mounted completed well monument, which equates to groundwater elevations of 68.58 feet elevation NAVD88 (monitoring well NWN-MW03) to 77.21 feet NAVD88 (monitoring well NWN-MW04). The groundwater gradient was 0.047 foot per foot to the east (Figure 14). There are no monitoring wells screened in the intermediate groundwater interval at the 175 Newport Way Northwest area of interest, so the vertical gradient between the shallow and intermediate groundwater intervals could not be assessed.

PFOS was detected at concentrations exceeding the Investigatory Level of 0.070 µg/l in the reconnaissance groundwater samples collected from borings NWN-R01 through NWN-R03 at depths ranging from 19 to 39 feet bgs. The maximum PFOS concentration reported was 9.5 µg/l in the reconnaissance groundwater sample collected from boring NWN-R02 at a depth of 23 feet bgs, within the area of suspected high mass loading for PFAS associated with historical AFFF training exercises and associated surface runoff and/or infiltration (Table 7). Short-chain PFAS were detected at concentrations ranging from 0.0025 to 2.3 µg/l in the reconnaissance groundwater samples collected from borings NWN-R01 through NWN-R03 (Table 6). Long-chain PFAS were detected at concentrations ranging from 0.0011 to 0.24 µg/l in the groundwater samples collected from the same borings (Table 7).

PFOA was detected at concentrations less than the Investigatory Level in the groundwater samples collected from monitoring wells NWN-MW01 and NWN-MW02 (Table 9; Figure 14). PFOA was detected at concentrations exceeding the Investigatory Level in the groundwater samples collected from monitoring wells NWN-MW03 and NWN-MW04 (Table 9; Figure 14). PFOA was detected at concentrations of 0.39 and 0.45 µg/l, exceeding the Investigatory Level, in the reconnaissance groundwater samples collected from borings NWN-R01 and NWN-R02 at depths of 19 and 23 feet bgs, respectively (Table 7). PFOA was detected at concentrations less than the Investigatory Level in the reconnaissance groundwater samples collected from boring NWN-R03 at depths of 28 and 39 feet bgs (Table 7).

PFOS was detected at concentrations exceeding the Investigatory Level of 0.070 µg/l in the groundwater samples collected from monitoring wells NWN-MW02 through NWN-MW04. PFOS was also detected at a concentration of 0.052 µg/l, less than the Investigatory Level for groundwater, in the groundwater sample collected from monitoring well NWN-MW01 (Table 9). The sum of PFOA and PFOS concentrations in groundwater samples collected from monitoring well NWN-MW01 was 0.064 µg/l, slightly less than the Investigatory Level of 0.070 µg/l (Table 9; Figure 14). The maximum reported PFOS concentration in groundwater was 2.4 µg/l in the groundwater sample collected from monitoring well NWN-MW04, within the historical AFFF training area on the western portion of the 175 Newport Way Northwest area of interest, at a depth of 18 feet bgs (Table 9). The reported concentrations of PFOS in the groundwater samples collected from down-gradient monitoring wells NWN-MW02 and NWN-MW03 were less than the concentrations reported for monitoring well NWN-MW04 to the west (Figure 14). Short-chain PFAS were detected at concentrations ranging from 0.0021 to 0.67 µg/l in the groundwater samples collected from monitoring wells NWN-MW01 through NWN-MW04 (Table 8). Long-chain PFAS were detected at concentrations ranging from 0.00094 to 0.13 µg/l in the groundwater samples collected from the same monitoring wells (Table 9; Figure 14).

4.6 LOWER ISSAQUAH VALLEY REGIONAL GROUNDWATER

In addition to groundwater-level gauging and collection of samples at monitoring wells screened in the shallow groundwater, a more-regional assessment of intermediate groundwater conditions was performed at monitoring wells previously installed by the City of Issaquah, including monitoring wells COI-MW02 through COI-MW07, which are screened in intermediate groundwater from depths between approximately 70 to 110 feet bgs (Table 1). The regional intermediate groundwater levels ranged from 3.71 to 19.44 feet below the monitoring well top-of-casing at the flush-mounted completed well monument, which equates to groundwater elevations of 56.98 feet NAVD88 (monitoring well COI-MW03) to 70.86 feet NAVD88 (monitoring well COI-MW07). The groundwater gradient was approximately 0.003 foot per foot and the flow direction was north (Figure 3).

Because there are no monitoring wells screened in the intermediate groundwater interval at the five areas of interest, the vertical gradient between the shallow and intermediate groundwater intervals could not be assessed. Shallow groundwater levels measured at all four monitoring wells installed at the 175 Newport Way Northwest area of interest were higher than the groundwater level measured at nearby down-gradient monitoring well COI-MW06, screened in the intermediate groundwater-bearing zone. The observed shallow groundwater elevation in monitoring well NWN-MW04 installed on the western portion of the 175 Newport Way Northwest area of interest was also higher than at up-gradient monitoring well COI-MW07, screened in the intermediate groundwater-bearing zone. A similar condition was noted for shallow groundwater levels measured at the West Playfield and Dodd Fields Park areas of interest compared to groundwater levels measured at nearby monitoring wells COI-MW06 and COI-MW05, screened in the intermediate groundwater-bearing zone.

PFOA was detected at a concentration of 0.25 µg/l in the groundwater sample collected from monitoring well COI-MW06 (Table 9), which exceeds the Investigatory Level of 0.070 ug/l. PFOA was detected at concentrations less than the Investigatory Level for groundwater in the groundwater samples collected from monitoring wells COI-MW03, COI-MW05 and COI-MW07 (Table 9; Figure 15). PFOA was reported non-detect at the laboratory MRL in the groundwater samples collected from monitoring wells COI-MW02 and COI-MW04.

PFOS was detected at concentrations exceeding the Investigatory Level of 0.070 µg/l in groundwater samples collected from monitoring wells COI-MW05 and COI-MW06 (Table 9; Figure 15). PFOS was detected at concentrations less than the Investigatory Level in groundwater samples collected from monitoring wells COI-MW03, COI-MW04, and COI-MW07. The sum of PFOA and PFOS concentrations detected in the groundwater sample collected from monitoring well COI-MW03 was 0.0601 µg/l, slightly less than the Investigatory Level of 0.070 µg/l (Table 9; Figure 15). The maximum reported PFOS concentration in groundwater was 3.3 µg/l in the groundwater sample collected from monitoring well COI-MW06 at a depth of 90 feet bgs (Table 9; Figure 16). PFOS was reported non-detect at the laboratory MRL in the groundwater sample collected from monitoring well COI-MW02.

Short-chain PFAS were detected at concentrations ranging from 0.00097 to 1.1 µg/l in the groundwater samples collected from monitoring wells COI-MW02 through COI-MW07 (Table 8). Long-chain PFAS were detected at concentrations ranging from 0.00073 to 0.15 µg/l in the groundwater samples collected from the same monitoring wells (Table 9).

4.7 QUALITY ASSURANCE AND QUALITY CONTROL

Raw analytical data received from ALS were evaluated for measurement quality, including precision, accuracy, representativeness, comparability, completeness, and sensitivity, in accordance with the criteria identified in the Work Plan. Based on the measurement quality objectives presented in the Work Plan and summarized below, the analytical results presented in this report are considered usable and representative of environmental conditions and may be reported as final data. Analytical results for quality assurance and quality control samples, including field duplicates, equipment rinsate blanks, and field blanks are presented in Tables 10 and 11. Complete analytical laboratory reports are provided in Appendix D.

4.7.1 Precision

Precision for PFOA and PFOS measurements was evaluated through calculation of the relative percent difference (RPD) between analytical results for the following sample and duplicate/split sample pairs and matrix spike (MS) and matrix spike duplicate (MSD) sample pairs. Sample and duplicate/split sample pairs included:

- Soil sample NWN-MW04-181019-5 and field split soil sample NWN-MW04-181019-DUP;
- Groundwater sample DF-MW02-180803 and field duplicate sample QA/QC-01-180803;
- Groundwater sample NWN_R01_180824_19 and field duplicate sample NWN_R01_180824_19_DUPLICATE; and
- Groundwater sample NWN-MW04-181016 and field duplicate sample NWN-MW04-181026-DUP

A duplicate sample was not collected for the multi-incremental soil samples. All RPD values for PFOA and PFOS sample and duplicate/split sample results and MS/MSD sample results were less than the target value of 40 percent for results detected at 5 times the laboratory practical quantitation limit. The maximum reported RPD was 12.5 percent for PFOA in the soil samples NWN-MW04-181019-5 and NWN-MW04-181019-DUP. The reported values were less than the laboratory-established RPD limit of 30 percent.

4.7.2 Accuracy

Accuracy for PFOA and PFOS measurements was evaluated using the laboratory-spike percent recovery reported by ALS for each sample and for MS/MSD samples, trip blanks, and rinsate blanks to assess sample cross-contamination and/or contamination during transport. ALS also analyzed laboratory method blanks to assess sample cross-contamination following receipt at the laboratory.

The Work Plan identified a target percent recovery value of 70 percent or more for samples analyzed by Modified EPA Method 537. However, laboratory-established control limits allowed for a wider range of acceptable values (Attachment B). All PFAS-analyte percent recovery values were within established laboratory control limits for Modified EPA Method 537. All PFOA and PFOS laboratory spike recovery values were within established laboratory control limits for Modified EPA Method 537.

PFOA was detected in trip blank TRIP_BLANK_180809 at a concentration of 0.00085 µg/l. PFOS was reported non-detect at the laboratory MRL for all trip blanks, rinsate blanks, and field blanks. Perfluorohexanoic acid and perfluoroundecanoic acid were detected in two trip blanks and one rinsate blank.

PFOA was detected in the cooler trip blank associated with the multi-incremental soil sample collected from decision unit DU-2B at an estimated concentration of 0.00085 µg/l, which is less than the laboratory MRL for the matrix submitted and analytical method specified. The laboratory narrative for trip blank TRIP_BLANK_180809 noted the sample had an elevated method detection limit due to reduced sample volume. PFOA was detected at a concentration of 0.00042 mg/kg in the multi-incremental soil sample collected from decision unit DU-2B; this concentration is less than the MRL of 0.00096 mg/kg, but exceeds the method detection limit of 0.00018 mg/kg.

EPA (2017) National Functional Guidelines for Data Review indicate that because the target compound of interest was detected at concentrations less than the MRL in the sample and in the trip blank, the sample results associated with the trip blank should be reported non-detect at the MRL. However, in this particular case, the cooler containing the trip blank only transported multi-incremental soil sub-samples for one decision unit, DU-2B, that were composited together in the laboratory, negating cross-contamination impacts between samples. The reported result for decision unit DU-2B is therefore qualified as an estimated detection with a high bias on the basis of the trip blank analytical results, in addition to the qualification based on the reported concentration being less than the MRL.

Quality control analytical results indicate that:

- Field collection methods did not introduce PFOA or PFOS into media sampled;
- Field decontamination procedures were adequate to reduce the presence of PFAS on reusable field equipment to concentrations less than the laboratory MRL;
- Disposable field equipment, including nitrile gloves and sonic sample recovery bags, did not introduce PFAS into samples at concentrations exceeding the laboratory MRL; and
- Collection and transport of samples packaged in coolers with wet ice to maintain proper preservation did not introduce PFAS into samples at concentrations that may potentially affect analytical results.

4.7.3 Representativeness and Comparability

Samples were collected using standard methods in accordance with the requirements of the Work Plan and analyzed by an analytical laboratory with a current certification from the U.S. Department of Defense Environmental Laboratory Accreditation Program for PFAS in soil and groundwater by Modified EPA Method 537 (U.S. Department of Defense 2017). These practices satisfy the Work Plan requirements for representativeness and comparability.

4.7.4 Completeness

Completeness is defined as the percentage of measurements judged to be valid. Results are considered valid if they are not rejected during data validation. None of the analytical results were rejected as part of the data review and quality assurance/quality control process. The Study therefore meets the Work Plan target for completeness.

4.7.5 Sensitivity

Modified EPA Method 537 achieved project sensitivity standards by maintaining a method detection limit sufficiently low to evaluate concentrations of PFAS in soil and groundwater relative to Investigatory Levels, including those for unrestricted land use, protection of groundwater from unsaturated soil, and groundwater. The analytical results generated through the Study field characterization program therefore meet the Work Plan requirements for sensitivity.

5.0 CONCLUSIONS

Farallon has prepared this Summary Report on behalf of EFR for the Parties to summarize the work performed and analytical results for the Study. Previous work identified five areas of interest with confirmed historical use of AFFF in firefighting training exercises (Figure 2). These five areas of interest were selected for further evaluation of shallow soil, vadose zone soil, and groundwater as part of the Study.

Although PFAS are not regulated as hazardous substances under federal or Washington State law, the field investigation performed for the Study was consistent with the requirements of MTCA, as established in WAC 173-340. If necessary in the future, data collected as part of the Study can be used as a basis for a conceptual site model and to support the development and evaluation of any future cleanup actions that may be required under Ecology supervision.

The Study identified PFAS impacts to shallow soil, vadose zone soil, and shallow groundwater at all five areas of interest. PFAS impacts to intermediate groundwater were also identified at intermediate groundwater interval monitoring wells COI-MW05 and COI-MW06.

5.1 SOIL

Concentrations of PFAS, including PFOA and PFOS, were less than the Investigatory Level for unrestricted (residential) contact in all multi-incremental soil samples and discrete vadose zone soil sample analyzed. These data indicate the soil sampled as part of the Study does not present a risk to human health if exposure to soil occurs during normal use of public spaces for sports, leisure, or other activities. Study soil analytical data also confirm that prior releases of AFFF associated with historical training exercises have resulted in concentrations of PFOA or PFOS in shallow and/or vadose zone soil at all five areas of interest that exceed the Investigatory Level for protection of groundwater for unsaturated soil.

5.2 GROUNDWATER

Groundwater occurrence, flow direction, and PFAS impacts at each of the areas of interest evaluated as part of the Study are discussed below. Only one groundwater monitoring event has been performed and is presented in this report; therefore, it is not known whether local shallow groundwater elevations, flow directions, and gradients vary seasonally. Reconnaissance groundwater and monitoring well groundwater sampling analytical results confirm that the pathway for migration of PFAS from soil to shallow groundwater is complete for all the areas of interest.

5.2.1 West Playfield and Dodd Fields Park Areas of Interest

Shallow groundwater at the West Playfield and Dodd Fields Park areas of interest was first encountered at depths ranging from 9 to 23 feet bgs in the silty sand and silt unit present from the ground surface to approximately 15 to 25 feet bgs. Shallow groundwater at the West Playfield area of interest flows to the northwest with a groundwater gradient of 0.005 foot per foot. Shallow groundwater at the Dodd Fields Park area of interest flows northeast with a gradient of 0.007 foot per foot. Reconnaissance groundwater gauging and sampling at discrete depth intervals suggest that shallow groundwater in the coarse gravel and sands underlying the silty sand and silts at the West Playfield and Dodd Fields Park areas of interest is under semi-confined conditions. No monitoring wells screened in the intermediate groundwater are present at the West Playfield or Dodd Fields Park areas of interest, so the vertical gradient between shallow and intermediate groundwater could not be directly assessed.

PFAS impacts to shallow groundwater on, and down-gradient of, the West Playfield and Dodd Fields Park areas of interest exceeded the Investigatory Level for PFOS and PFOA of 0.070 µg/l, and were elevated relative to those at up-gradient monitoring well IES-MW01. The maximum reported PFOS concentration in groundwater was 0.55 µg/l in the sample collected from monitoring well DF-MW02 in the area of highest suspected mass loading for the Dodd Fields Park area of interest.

5.2.2 Memorial Field and Rainier Trail Areas of Interest

Shallow groundwater at the Memorial Field and Rainier Trail areas of interest was first encountered at depths ranging from 30 to 41 feet bgs in well-graded sands and gravels present to the maximum depth explored of 50 feet bgs. Shallow groundwater at the Memorial Field area of interest flows to the northeast with a groundwater gradient of 0.0016 foot per foot. Shallow groundwater at the Rainier Trail area of interest flows north with a gradient of 0.003 foot per foot. Field observations, reconnaissance groundwater sampling attempts, and monitoring well gauging and sampling indicate shallow groundwater elevations appear to fluctuate seasonally under both areas of interest. No monitoring wells screened in the intermediate groundwater are present at the Memorial Field or Rainier Trail areas of interest, so the vertical gradient between shallow and intermediate groundwater could not be directly assessed at either location.

PFAS impacts to groundwater on, and down-gradient of, the Memorial Field and Rainier Trail areas of interest were slightly elevated relative to southernmost monitoring well RT-MW04. Groundwater elevation monitoring indicates groundwater flows north-northeast at the Memorial Field and north at the Rainier Trail areas of interest. The sum of PFOS and PFOA concentrations detected in groundwater samples collected from monitoring wells RT-MW01, RT-MW03, and MF-MW02 was slightly less than the Investigatory Level of 0.070 µg/l. PFOS and PFOA were detected at concentrations ranging from 0.0012 to 0.0058 µg/l in groundwater samples collected from monitoring wells MF-MW01 and MF-MW03, only slightly exceeding laboratory MRLs. The maximum reported sum of PFOS and PFOA concentrations in groundwater was 0.068 µg/l in the sample collected from monitoring well RT-MW01, directly down-gradient of the Rainier Trail area of interest. Groundwater elevation monitoring performed in October 2018 did not include intermediate groundwater-bearing zone monitoring wells; therefore, the relationship between shallow groundwater and intermediate groundwater has not been established.

5.2.3 175 Newport Way Northwest Area of Interest

Shallow groundwater at the 175 Newport Way Northwest area of interest was first encountered at depths ranging from 15 to 26 feet bgs in sand and gravel present to the maximum depth explored of 40 feet bgs. A hard gray silt underlies first-encountered groundwater in the sands and gravels on the western portion of the 175 Newport Way Northwest area of interest. Shallow groundwater at the 175 Newport Way Northwest area of interest flows to the east with a groundwater gradient of 0.047 foot per foot. No monitoring wells screened in the intermediate groundwater are present at 175 Newport Way Northwest, so the vertical gradient between shallow and intermediate groundwater could not be directly assessed at this location.

Concentrations of PFAS detected in groundwater on the 175 Newport Way Northwest area of interest exceeded those detected at other areas of interest. PFOS was detected at concentrations ranging from 0.052 µg/l in the groundwater sample collected from shallow monitoring well NWN-MW01 to 2.2 µg/l in the groundwater sample collected from shallow monitoring well NWN-MW04 in the former AFFF training area on the western portion of the 175 Newport Way Northwest property. PFOA concentrations ranged from 0.012 to 0.20 µg/l in the same monitoring wells. Monitoring well gauging indicates groundwater flows to the east-northeast.

5.2.4 Lower Issaquah Valley Regional Groundwater

The regional intermediate groundwater elevations ranged from 57.98 feet NAVD88 (monitoring well COI-MW03) to 70.86 feet NAVD88 (monitoring well COI-MW07). The groundwater gradient for the intermediate groundwater interval was approximately 0.003 foot per foot and the flow direction was north across the Study area.

Lower Issaquah Valley area-wide intermediate groundwater sampling indicates that PFOS concentrations exceed the Investigatory Level in groundwater samples collected from monitoring wells COI-MW05 and COI-MW06. PFOS was detected at concentrations less than the Investigatory Level in groundwater samples collected from monitoring wells COI-MW03, COI-MW04, and COI-MW07. The sum of PFOA and PFOS concentrations detected in the groundwater sample collected from monitoring well COI-MW03 was 0.0601 µg/l, slightly less than the Investigatory Level of 0.070 µg/l. PFOA and PFOS were reported non-detect at the laboratory MRL in the groundwater sample collected from monitoring well COI-MW02.

5.3 STUDY PERFORMANCE

The overall purpose of the Study was to assess potential impacts of PFAS associated with AFFF training exercises to soil and groundwater in the Lower Issaquah Valley. The overall purpose of the Study was satisfied through the collection of soil, reconnaissance groundwater, and groundwater samples at, and down-gradient of, confirmed and/or suspected sources in areas of interest identified in the Lower Issaquah Valley. Specific Study objectives were met through the following Study components:

- Areas of interest and potential points of release where historical operations included use of AFFF were identified through interviews, historical records review, and review of previous environmental sampling results;
- PFAS presence in vadose and/or saturated soil at suspected source areas was assessed through collection of discrete soil samples from select borings;

- Shallow groundwater-bearing zones, local shallow groundwater gradients, and flow directions were identified, and PFAS impacts to groundwater were evaluated through reconnaissance groundwater and groundwater sampling at borings and permanent monitoring wells;
- Synoptic area-wide groundwater quality was assessed through collection of groundwater samples from intermediate groundwater-bearing zone monitoring wells COI-MW02 through COI-MW07 to better characterize the distribution of PFAS across the Lower Issaquah Valley; and
- Analytical results for soil and groundwater were compared to Investigatory Levels for PFAS calculated by Ecology (2018a).

Study results met Work Plan requirements for quality assurance and quality control. The satisfaction of the specific Study objectives with final data concludes this phase of the Study.

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7.0 LIMITATIONS

7.1 GENERAL LIMITATIONS

The conclusions contained in this report/assessment are based on professional opinions with regard to the subject matter. These opinions have been arrived at in accordance with currently accepted hydrogeologic and engineering standards and practices applicable to this location. The conclusions contained herein are subject to the following inherent limitations:

- **Accuracy of Information**. Farallon obtained, reviewed, and evaluated certain information used in this report/assessment from sources that were believed to be reliable. Farallon's conclusions, opinions, and recommendations are based in part on such information. Farallon's services did not include verification of its accuracy or authenticity. Should the information upon which Farallon relied prove to be inaccurate or unreliable, Farallon reserves the right to amend or revise its conclusions, opinions, and/or recommendations.
- **Reconnaissance and/or Characterization**. Farallon performed a reconnaissance and/or characterization of the Site that is the subject of this report/assessment to document current conditions. Farallon focused on areas deemed more likely to exhibit hazardous materials conditions. Contamination may exist in other areas of the Site that were not investigated or were inaccessible. Site activities beyond Farallon's control could change at any time after the completion of this report/assessment.

For the foregoing reasons, Farallon cannot and does not warrant or guarantee that the Site is free of hazardous or potentially hazardous substances or conditions, or that latent or undiscovered conditions will not become evident in the future. Farallon's observations, findings, and opinions can be considered valid only as of the date of the report.

This report/assessment has been prepared in accordance with the contract for services between Farallon and Eastside Fire & Rescue, and currently accepted industry standards. No other warranties, representations, or certifications are made.

7.2 LIMITATION ON RELIANCE BY THIRD PARTIES

Reliance by third parties is prohibited. This report/assessment has been prepared for the exclusive use of the Eastside Fire & Rescue to address the unique needs of Eastside Fire & Rescue at a specific point in time. Any party provided a copy of this report by Eastside Fire & Rescue is subject to the same limitations as Eastside Fire & Rescue.

This is not a general grant of reliance. Any unauthorized use, interpretation, or reliance on this report/assessment is at the sole risk of that party and Farallon will have no liability for such unauthorized use, interpretation, or reliance.

FIGURES

PER- AND POLY-FLUOROALKYL SUBSTANCES
CHARACTERIZATION STUDY SUMMARY REPORT
Lower Issaquah Valley
Issaquah, Washington

Farallon PN: 1754-002

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FIGURE 1

ISSAQUAH VALLEY AND VICINITY
PFAS CHARACTERIZATION STUDY
LOWER ISSAQUAH VALLEY
ISSAQUAH, WASHINGTON

FARALLON PN: 1754-002

Drawn By: jjones | Checked By: EB | Date: 1/4/2019 | Disc Reference:

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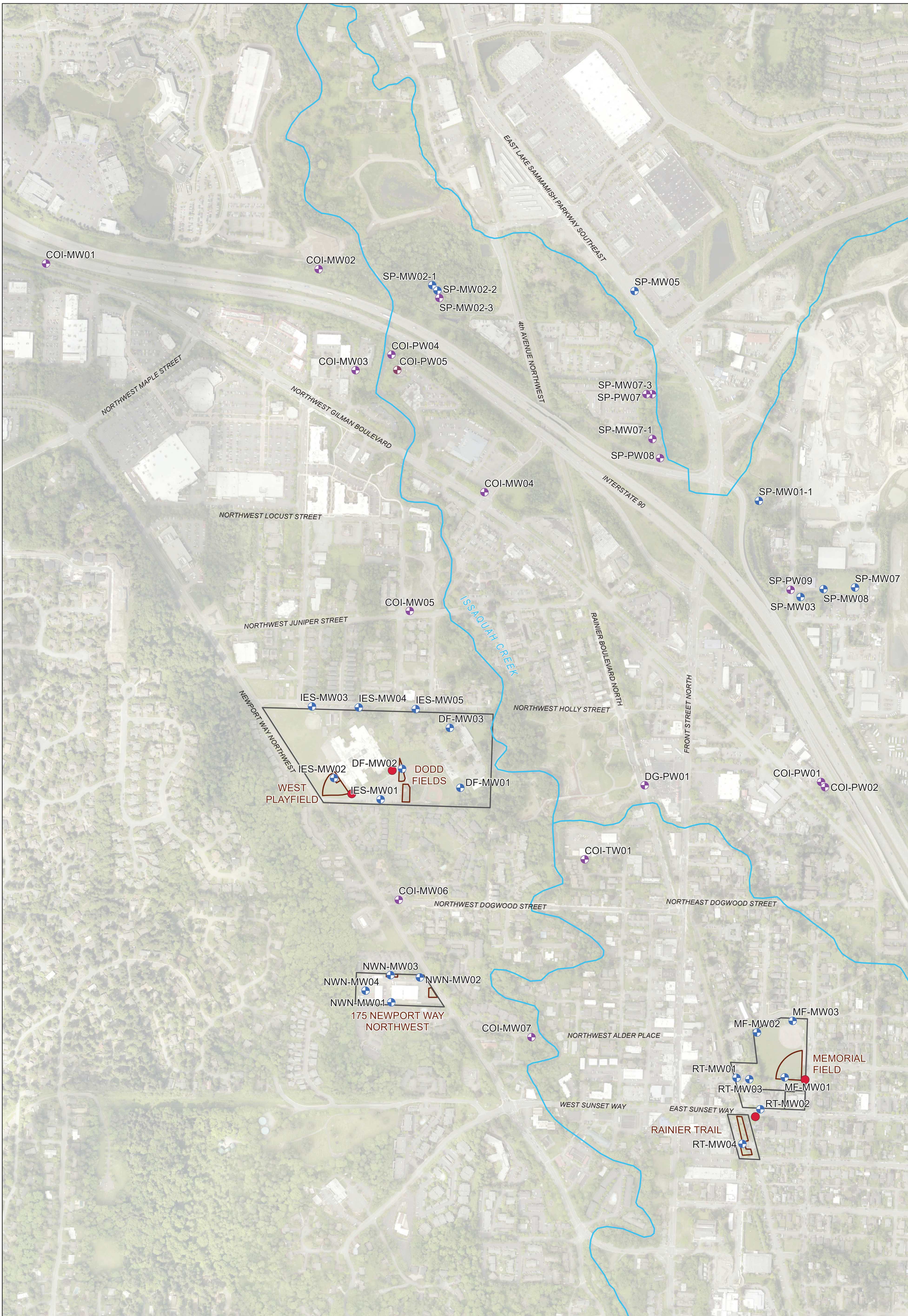

LEGEND

- SHALLOW MONITORING WELL
- INTERMEDIATE MONITORING WELL
- DEEP MONITORING WELL
- FIRE HYDRANT
- KING COUNTY PARCEL
- MIS DECISION UNIT

NOTES
MIS = MULTI INCREMENTAL SAMPLE
1. ALL LOCATIONS ARE APPROXIMATE
2. FIGURES WERE PRODUCED IN COLOR. GRAYSCALE COPIES MAY NOT REPRODUCE ALL ORIGINAL INFORMATION

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0 300
SCALE IN FEET

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FIGURE 2

AREAS OF INTEREST
PFAS CHARACTERIZATION STUDY
LOWER ISSAQUAH VALLEY
ISSAQUAH, WASHINGTON

FARALLON PN: 1754-002

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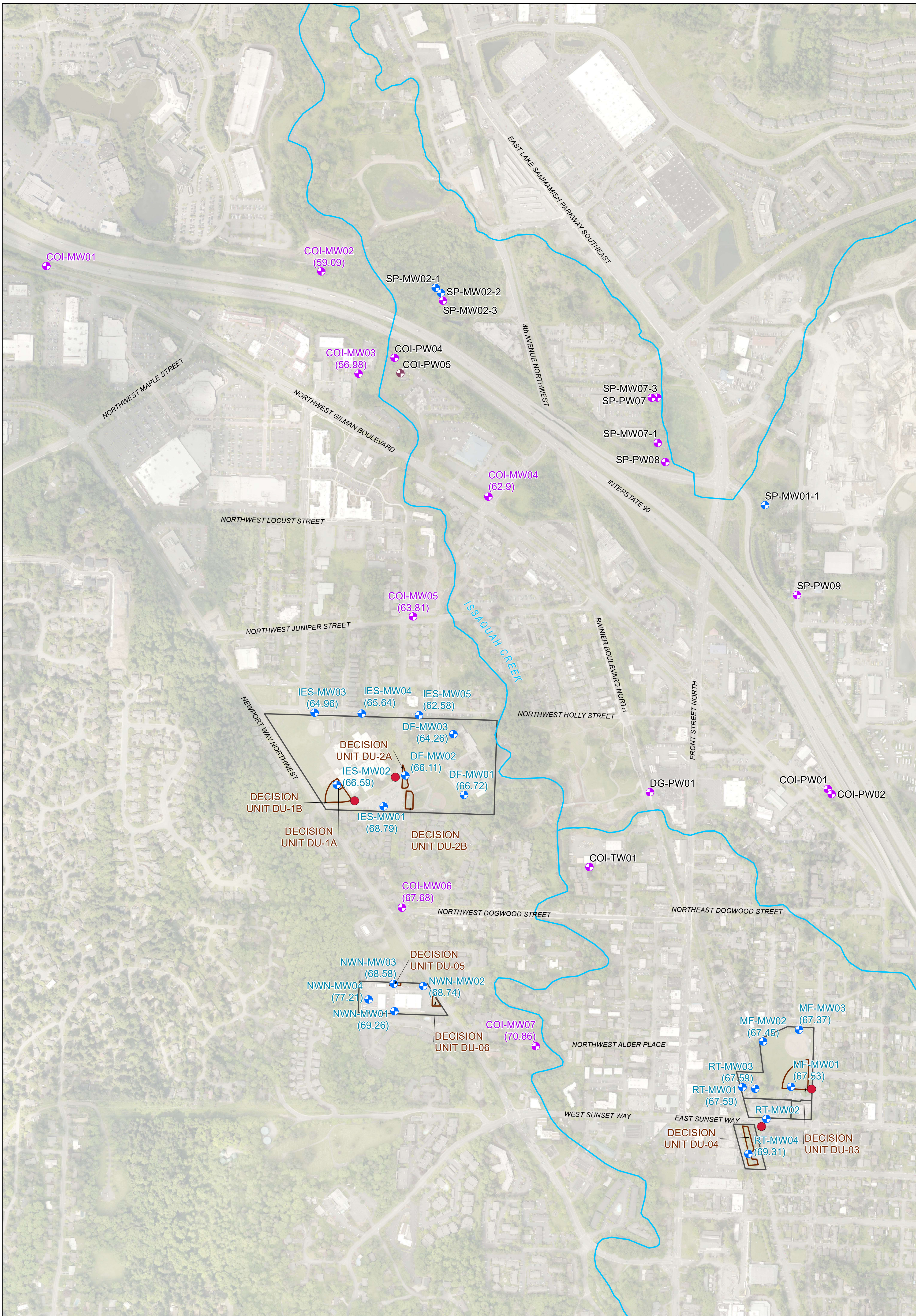

LEGEND

- SHALLOW MONITORING WELL
- INTERMEDIATE MONITORING WELL
- DEEP MONITORING WELL
- FIRE HYDRANT
- KING COUNTY PARCEL
- MIS DECISION UNIT

NOTES:

(68.79) = GROUNDWATER ELEVATION FOR SHALLOW MONITORING WELLS MEAN SEA LEVEL (MSL)

(70.86) = GROUNDWATER ELEVATION FOR REGIONAL INTERMEDIATE MONITORING WELLS LOWER VALLEY WELLS ARE SCREENED APPROXIMATELY 50 FEET DEEPER THAN THE OTHER WELLS

MIS = MULTI-INCREMENTAL SAMPLE

PFAS = PER- AND POLY-FLUOROALKYL SUBSTANCES

ELEVATIONS REPORTED IN FEET - NORTH AMERICAN VERTICAL DATUM OF 1988

N

0 300

SCALE IN FEET

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FIGURE 3

GROUNDWATER ELEVATIONS OCTOBER 2018
PFAS CHARACTERIZATION STUDY
LOWER ISSAQUAH VALLEY
ISSAQUAH, WASHINGTON

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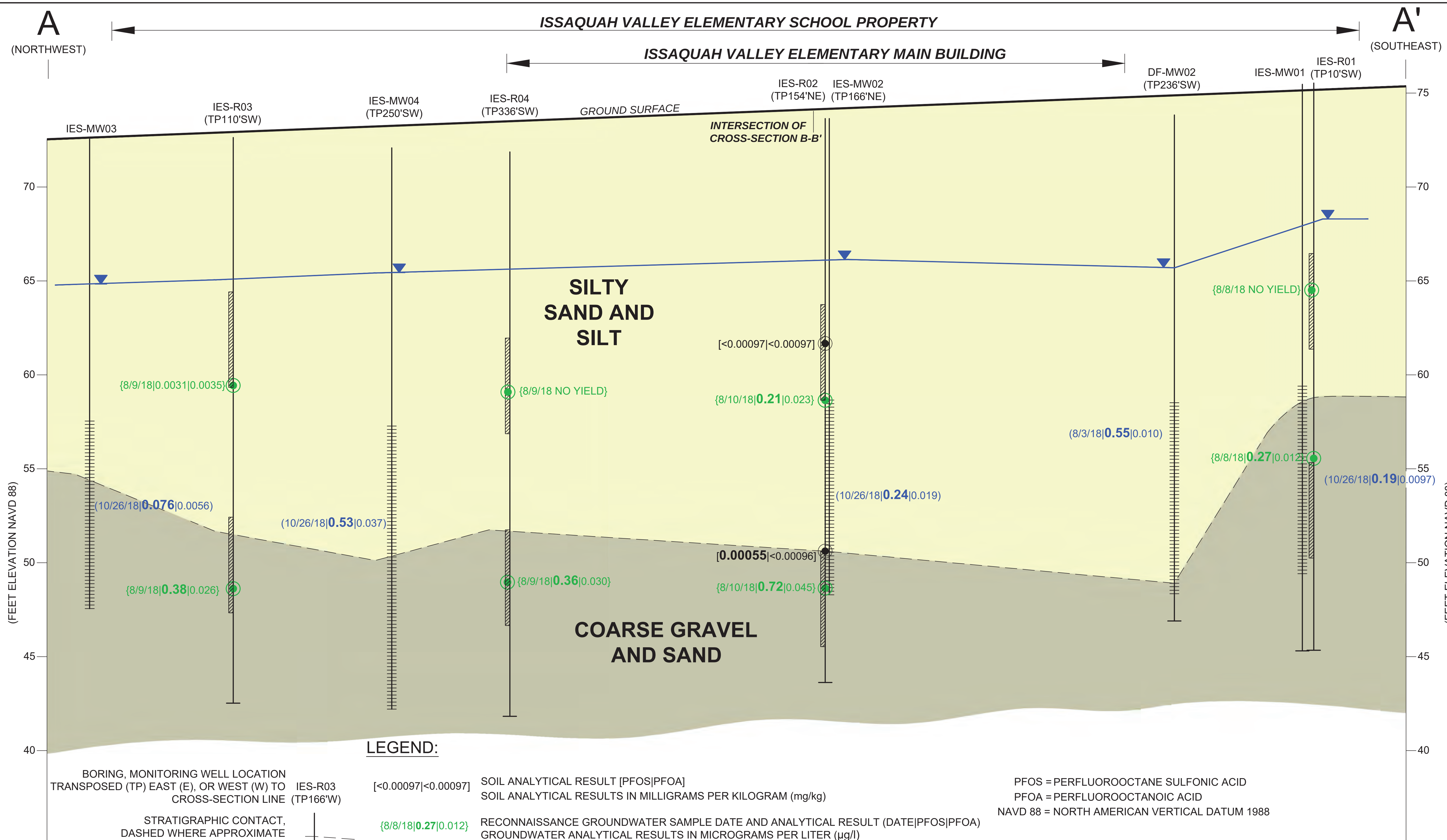

LEGEND:

BORING, MONITORING WELL LOCATION TRANSPOSED (TP) EAST (E), OR WEST (W) TO CROSS-SECTION LINE — IES-R03 (TP166'W)

STRATIGRAPHIC CONTACT, DASHED WHERE APPROXIMATE

[SOIL SAMPLE]

(RECONNAISSANCE GROUNDWATER SAMPLE)

GROUNDWATER ELEVATION

BLANK CASING

RECONNAISSANCE WELL SCREEN INTERVAL

WELL SCREEN INTERVAL

[<0.00097|<0.00097] SOIL ANALYTICAL RESULT [PFOS|PFOA]
SOIL ANALYTICAL RESULTS IN MILLIGRAMS PER KILOGRAM (mg/kg)

{8/8/18|**0.27**|0.012} RECONNAISSANCE GROUNDWATER SAMPLE DATE AND ANALYTICAL RESULT (DATE|PFOS|PFOA)
GROUNDWATER ANALYTICAL RESULTS IN MICROGRAMS PER LITER (µg/l)

(10/26/18|**0.076**|0.0056) GROUNDWATER SAMPLE DATE AND ANALYTICAL RESULT (DATE|PFOS|PFOA)
GROUNDWATER ANALYTICAL RESULTS IN µg/l

BOLD = INDICATES CONCENTRATIONS EXCEED WASHINGTON STATE INVESTIGATORY LEVEL

< = DENOTES ANALYTE NOT DETECTED AT OR EXCEEDING THE REPORTING LIMIT LISTED

CROSS-SECTION LOCATION SHOWN OF FIGURE 9

PFOS = PERFLUOROOCTANE SULFONIC ACID
PFOA = PERFLUOROOCTANOIC ACID
NAVD 88 = NORTH AMERICAN VERTICAL DATUM 1988

5' 0' 0' 60'

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FIGURE 4

CROSS-SECTION A-A'
PFAS CHARACTERIZATION STUDY
LOWER ISSAQUAH VALLEY
ISSAQUAH, WASHINGTON

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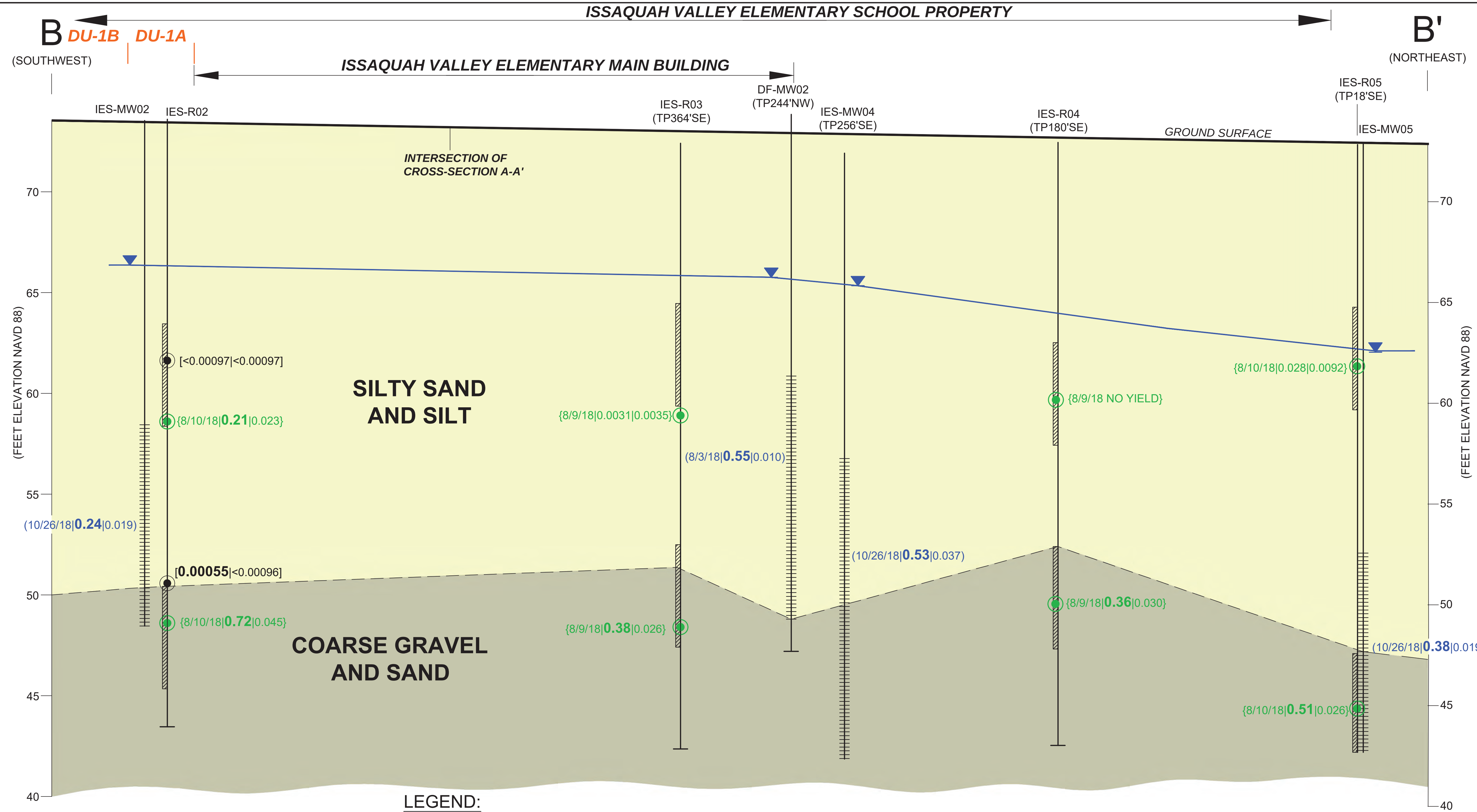

LEGEND:

BORING, MONITORING WELL LOCATION TRANSPOSED (TP) EAST (E), WEST (W), SOUTH (S), OR NORTH (N) TO CROSS-SECTION LINE — IES-R03 (TP384'SE)

STRATIGRAPHIC CONTACT, DASHED WHERE APPROXIMATE

[SOIL SAMPLE]

(RECONNAISSANCE GROUNDWATER SAMPLE)

GROUNDWATER ELEVATION

BLANK CASING

RECONNAISSANCE WELL SCREEN INTERVAL

WELL SCREEN INTERVAL

5'
0'
0'
60'

[<0.00097|<0.00097] SOIL ANALYTICAL RESULT [PFOS|PFOA]
SOIL ANALYTICAL RESULTS IN MILLIGRAMS PER KILOGRAM (mg/kg)

{8/8/18|**0.27**|0.012} RECONNAISSANCE GROUNDWATER SAMPLE DATE AND ANALYTICAL RESULT (DATE|PFOS|PFOA)
GROUNDWATER ANALYTICAL RESULTS IN MICROGRAMS PER LITER (µg/l)

(10/26/18|**0.076**|0.0056) GROUNDWATER SAMPLE DATE AND ANALYTICAL RESULT (DATE|PFOS|PFOA)
GROUNDWATER ANALYTICAL RESULTS IN µg/l

BOLD = INDICATES CONCENTRATIONS EXCEED WASHINGTON STATE INVESTIGATORY LEVEL

< = DENOTES ANALYTE NOT DETECTED AT OR EXCEEDING THE REPORTING LIMIT LISTED

DU-1A = MULTI-INCREMENTAL SOIL SAMPLE DECISION UNIT

CROSS-SECTION LOCATION SHOWN OF FIGURE 9

PFOS = PERFLUOROOCTANE SULFONIC ACID
PFOA = PERFLUOROOCTANOIC ACID
NAVD 88 = NORTH AMERICAN VERTICAL DATUM 1988

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FIGURE 5

CROSS-SECTION B-B'
PFAS CHARACTERIZATION STUDY
LOWER ISSAQUAH VALLEY
ISSAQUAH, WASHINGTON

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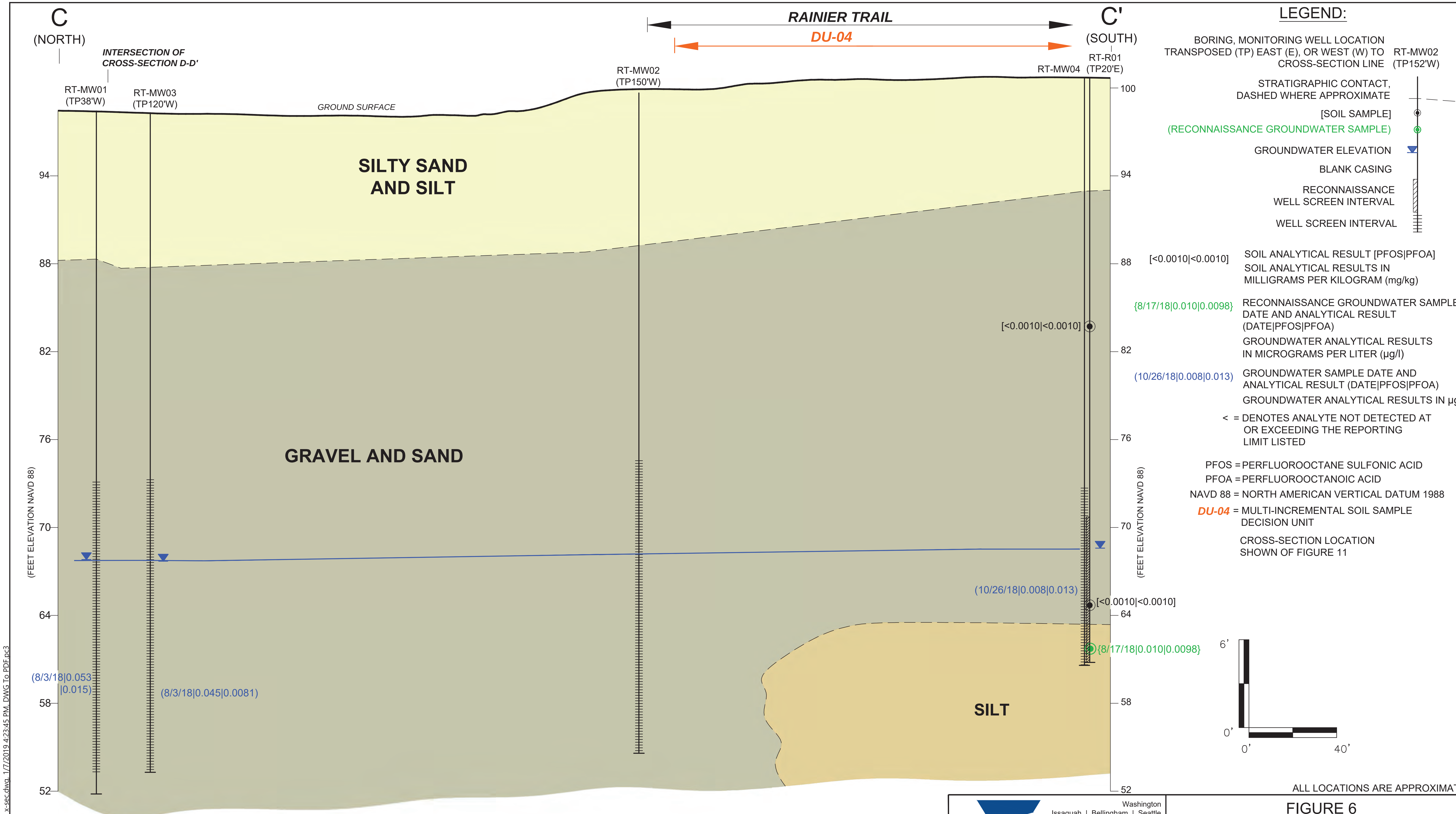

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FIGURE 6

CROSS-SECTION C-C'
PFAS CHARACTERIZATION STUDY
LOWER ISSAQUAH VALLEY
ISSAQUAH, WASHINGTON

FARALLON PN: 1754-002

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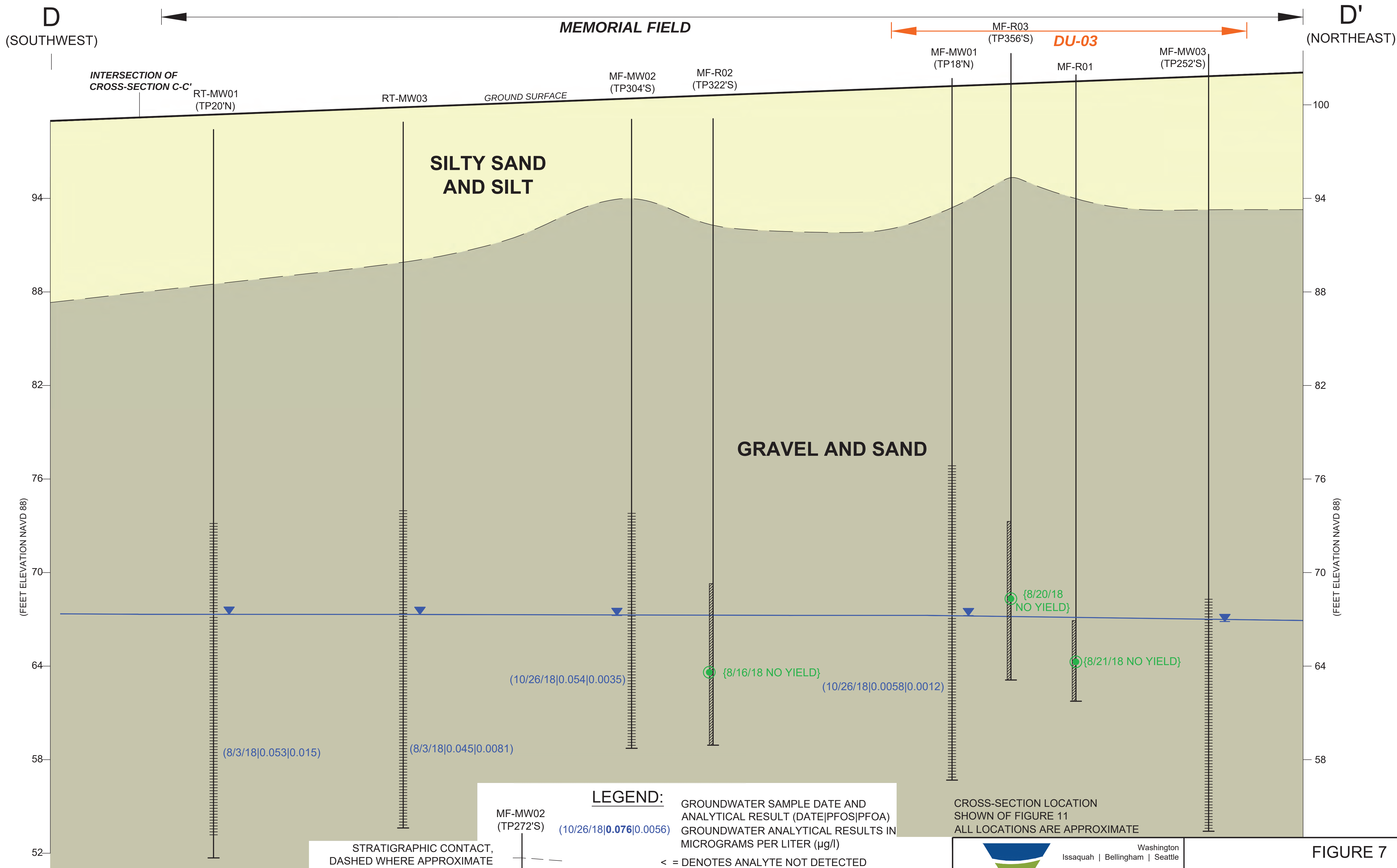

LEGEND:

MF-MW02 (TP272'S) — BORING, MONITORING WELL LOCATION TRANSPOSED (TP) NORTH (N), OR SOUTH (S) TO CROSS-SECTION LINE

(10/26/18|**0.076**|0.0056) GROUNDWATER SAMPLE DATE AND ANALYTICAL RESULT (DATE|PFOS|PFOA) GROUNDWATER ANALYTICAL RESULTS IN MICROGRAMS PER LITER (µg/l)

STRATIGRAPHIC CONTACT, DASHED WHERE APPROXIMATE

GROUNDWATER ELEVATION

BLANK CASING

(RECONNAISSANCE GROUNDWATER SAMPLE)

RECONNAISSANCE WELL SCREEN INTERVAL

WELL SCREEN INTERVAL

< = DENOTES ANALYTE NOT DETECTED AT OR EXCEEDING THE REPORTING LIMIT LISTED

PFOS = PERFLUOROOCTANE SULFONIC ACID

PFOA = PERFLUOROOCTANOIC ACID

NAVD 88 = NORTH AMERICAN VERTICAL DATUM 1988

DU-03 = MULTI-INCREMENTAL SOIL SAMPLE DECISION UNIT

CROSS-SECTION LOCATION SHOWN OF FIGURE 11
ALL LOCATIONS ARE APPROXIMATE

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FIGURE 7

CROSS-SECTION D-D'
PFAS CHARACTERIZATION STUDY
LOWER ISSAQUAH VALLEY
ISSAQUAH, WASHINGTON

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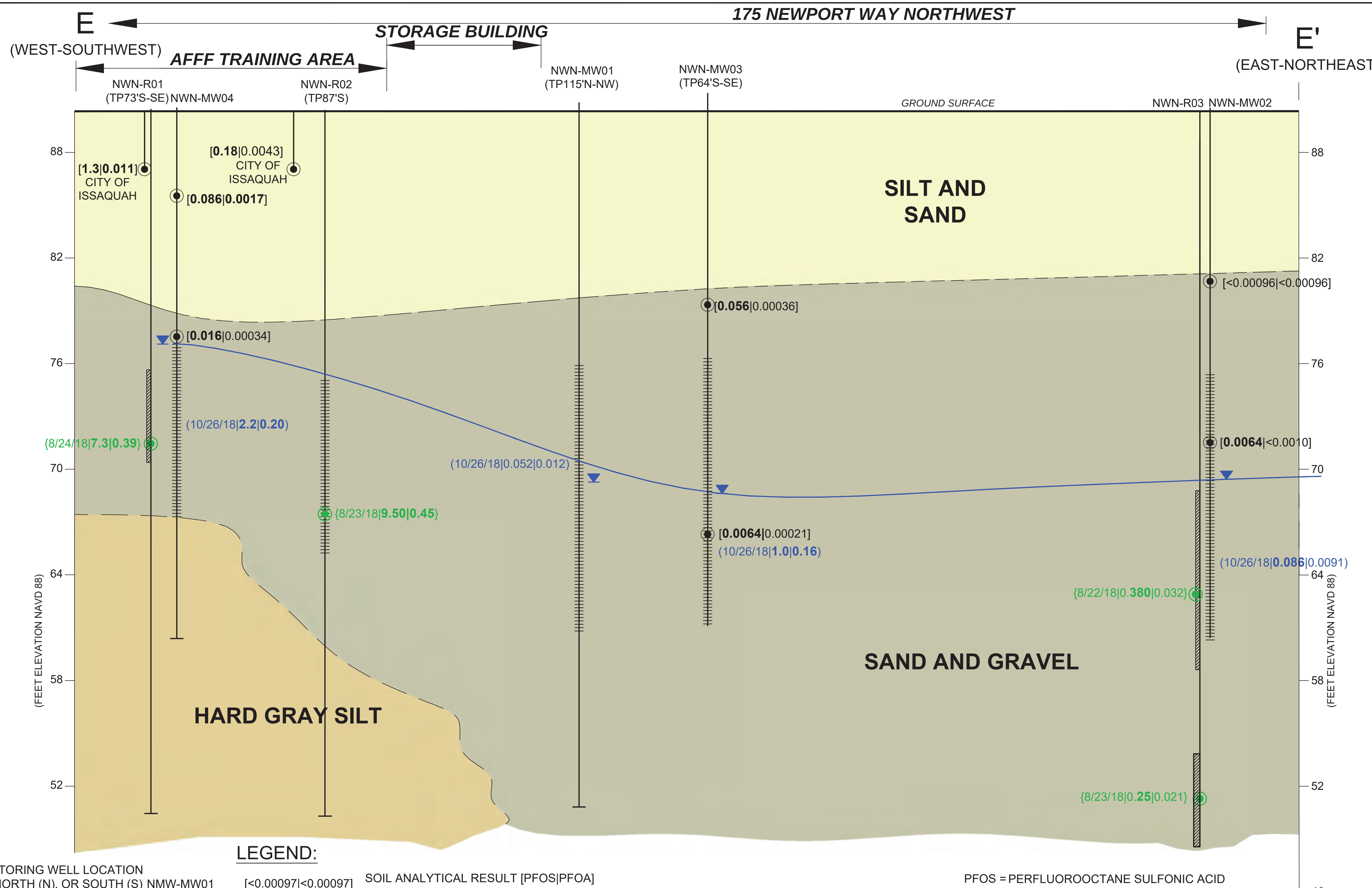

LEGEND:

BORING, MONITORING WELL LOCATION TRANSPOSED (TP) NORTH (N), OR SOUTH (S) TO CROSS-SECTION LINE — NMW-MW01 (TP115'N)

STRATIGRAPHIC CONTACT, DASHED WHERE APPROXIMATE

[SOIL SAMPLE]

(RECONNAISSANCE GROUNDWATER SAMPLE)

GROUNDWATER ELEVATION

BLANK CASING

RECONNAISSANCE WELL SCREEN INTERVAL

WELL SCREEN INTERVAL

[<0.00097|<0.00097] SOIL ANALYTICAL RESULT [PFOS|PFOA]
SOIL ANALYTICAL RESULTS IN MILLIGRAMS PER KILOGRAM (mg/kg)

{8/8/18|**0.27**|0.012} RECONNAISSANCE GROUNDWATER SAMPLE DATE AND ANALYTICAL RESULT (DATE|PFOS|PFOA)
GROUNDWATER ANALYTICAL RESULTS IN MICROGRAMS PER LITER (µg/l)

(10/26/18|**0.076**|0.0056) GROUNDWATER SAMPLE DATE AND ANALYTICAL RESULT (DATE|PFOS|PFOA)
GROUNDWATER ANALYTICAL RESULTS IN µg/l

BOLD = INDICATES CONCENTRATIONS EXCEED WASHINGTON STATE INVESTIGATORY LEVEL

< = DENOTES ANALYTE NOT DETECTED AT OR EXCEEDING THE REPORTING LIMIT LISTED

CROSS-SECTION LOCATION SHOWN OF FIGURE 13

PFOS = PERFLUOROOCTANE SULFONIC ACID
PFOA = PERFLUOROOCTANOIC ACID
NAVD 88 = NORTH AMERICAN VERTICAL DATUM 1988

6' 0' 0' 40'

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FIGURE 8

CROSS-SECTION E-E'
PFAS CHARACTERIZATION STUDY
LOWER ISSAQUAH VALLEY
ISSAQUAH, WASHINGTON

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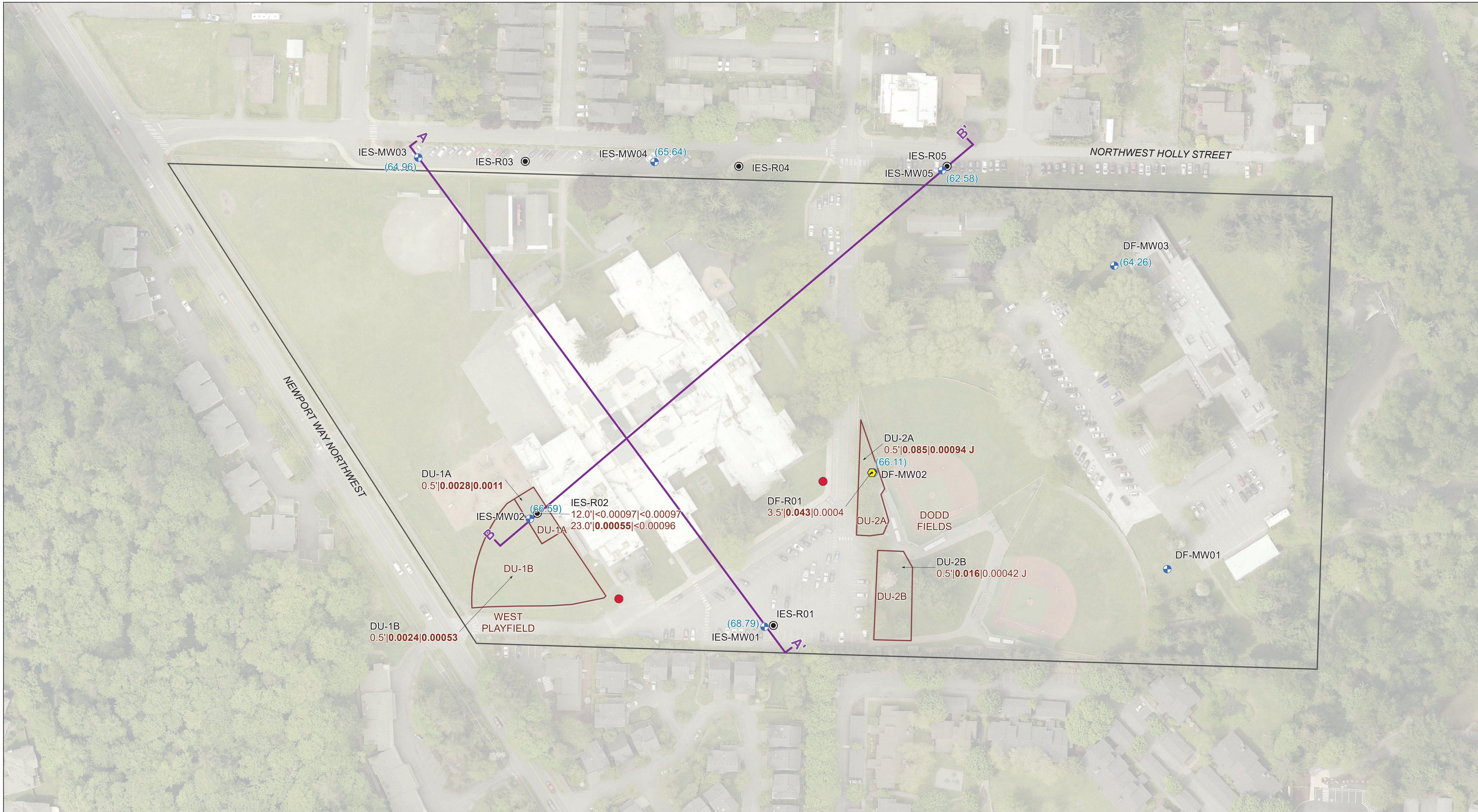

LEGEND

- BORING
- HAND AUGER SAMPLE
- A A' LINE OF CROSS-SECTION
- SHALLOW MONITORING WELL
- FIRE HYDRANT
- KING COUNTY PARCEL
- MIS DECISION UNIT
- (66.59) GROUNDWATER ELEVATION (10/26/2018) REPORTED IN FEET - NORTH AMERICAN VERTICAL DATUM OF 1988

NOTES:
SAMPLE RESULTS HIGHLIGHTED IN BROWN REPRESENT SOIL SAMPLES
DEPTH AND CONCENTRATIONS REPORTED AS:
SOIL SAMPLE DEPTH IN FEET BGS | PFOS | PFOA
ANALYTICAL RESULTS IN MILLIGRAMS PER KILOGRAM

1. ALL LOCATIONS ARE APPROXIMATE.
2. FIGURES WERE PRODUCED IN COLOR. GRAYSCALE COPIES MAY NOT REPRODUCE ALL ORIGINAL INFORMATION.

MIS = MULTI INCREMENTAL SAMPLE
PFAS = PER- AND POLY- FLUOROALKYL SUBSTANCES
PFOA = PERFLUOROOCTANOIC ACID
PFOS = PERFLUOROOCTANE SULFONIC ACID
BOLD = DENOTES CONCENTRATIONS EXCEEDING THE APPLICABLE WASHINGTON STATE DEPARTMENT OF ECOLOGY INVESTIGATORY LEVEL FOR PROTECTION OF GROUNDWATER FOR UNSATURATED SOIL
< = DENOTES ANALYTE NOT DETECTED AT OR EXCEEDING THE REPORTING LIMIT LISTED
BGS = BELOW GROUND SURFACE
J = RESULT AN ESTIMATE

N
0 60
SCALE IN FEET

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FIGURE 9
SOIL ANALYTICAL RESULTS
WEST PLAYFIELD AND DODD FIELDS PARK
PFAS CHARACTERIZATION STUDY
LOWER ISSAQUAH VALLEY
ISSAQUAH, WASHINGTON

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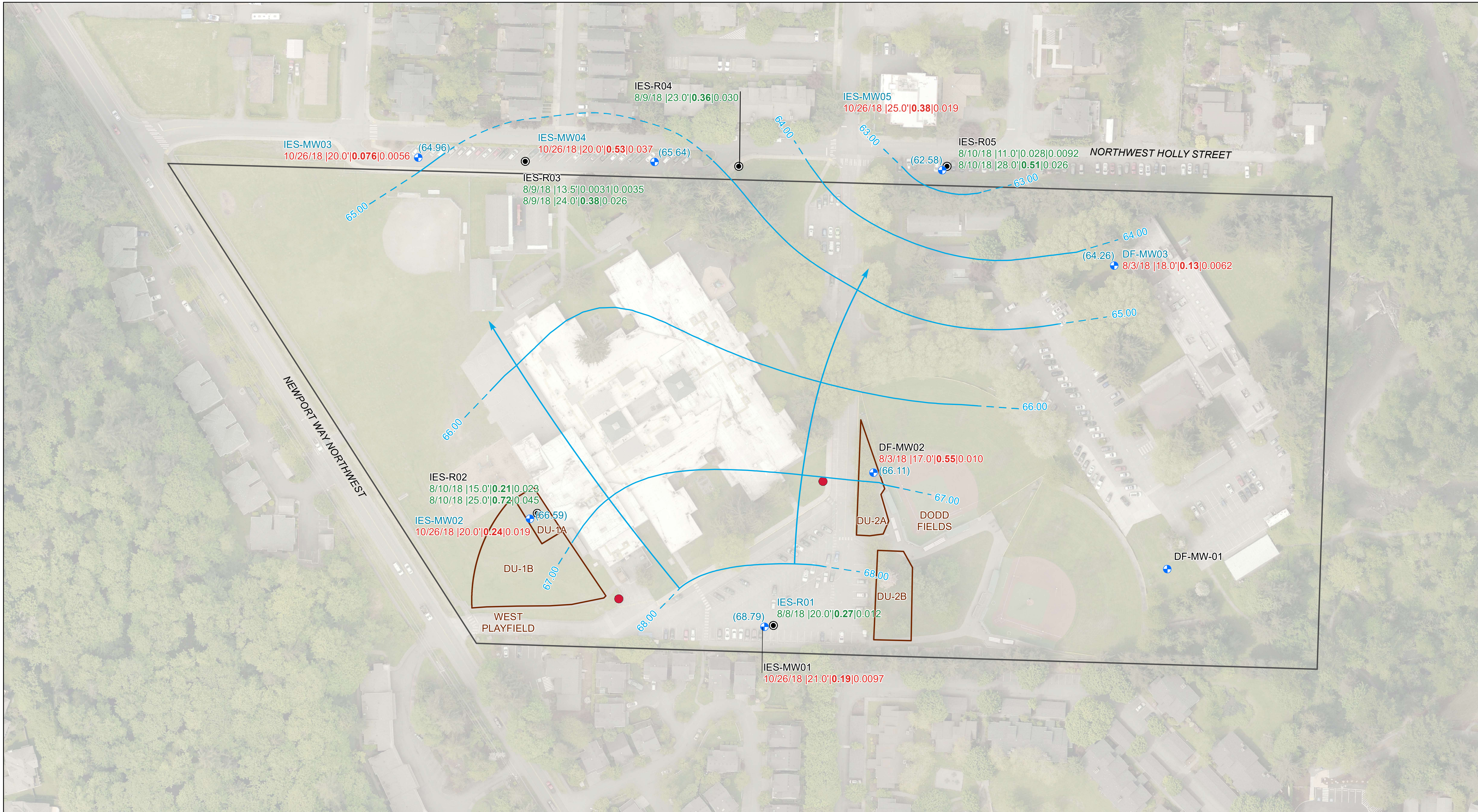

LEGEND

- BORING
- MONITORING WELL
- FIRE HYDRANT
- APPROXIMATE FLOW DIRECTION
- KING COUNTY PARCEL
- MIS DECISION UNIT
- (66.59) GROUNDWATER ELEVATION (10/26/2018) REPORTED IN FEET - NORTH AMERICAN VERTICAL DATUM OF 1988
- 66.00 APPROXIMATE GROUNDWATER ELEVATION CONTOUR (DASHED WHERE INFERRED)

NOTES:
SAMPLE RESULTS HIGHLIGHTED IN GREEN REPRESENT RECONNAISSANCE BORING TEMPORARY WELL GROUNDWATER RESULTS
SAMPLE RESULTS HIGHLIGHTED IN RED REPRESENT MONITORING WELL GROUNDWATER RESULTS
DEPTH AND CONCENTRATIONS REPORTED AS:
GROUNDWATER SAMPLE DATE | SAMPLE DEPTH IN FEET BGS | PFOS | PFOA ANALYTICAL RESULTS IN MICROGRAMS PER LITER

MIS = MULTI-INCREMENTAL SAMPLE
PFAS = PER- AND POLY- FLUOROALKYL SUBSTANCES
PFOA = PERFLUOROOCTANOIC ACID
PFOS = PERFLUOROOCTANE SULFONIC ACID
BOLD = DENOTES CONCENTRATIONS EXCEEDING THE APPLICABLE WASHINGTON STATE DEPARTMENT OF ECOLOGY INVESTIGATORY LEVEL OF 0.070 MICROGRAMS PER LITER
BGS = BELOW GROUND SURFACE

N
0 60
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FIGURE 10

GROUNDWATER ANALYTICAL RESULTS
WEST PLAYFIELD AND DODD FIELDS PARK
PFAS CHARACTERIZATION STUDY
LOWER ISSAQUAH VALLEY
ISSAQUAH, WASHINGTON

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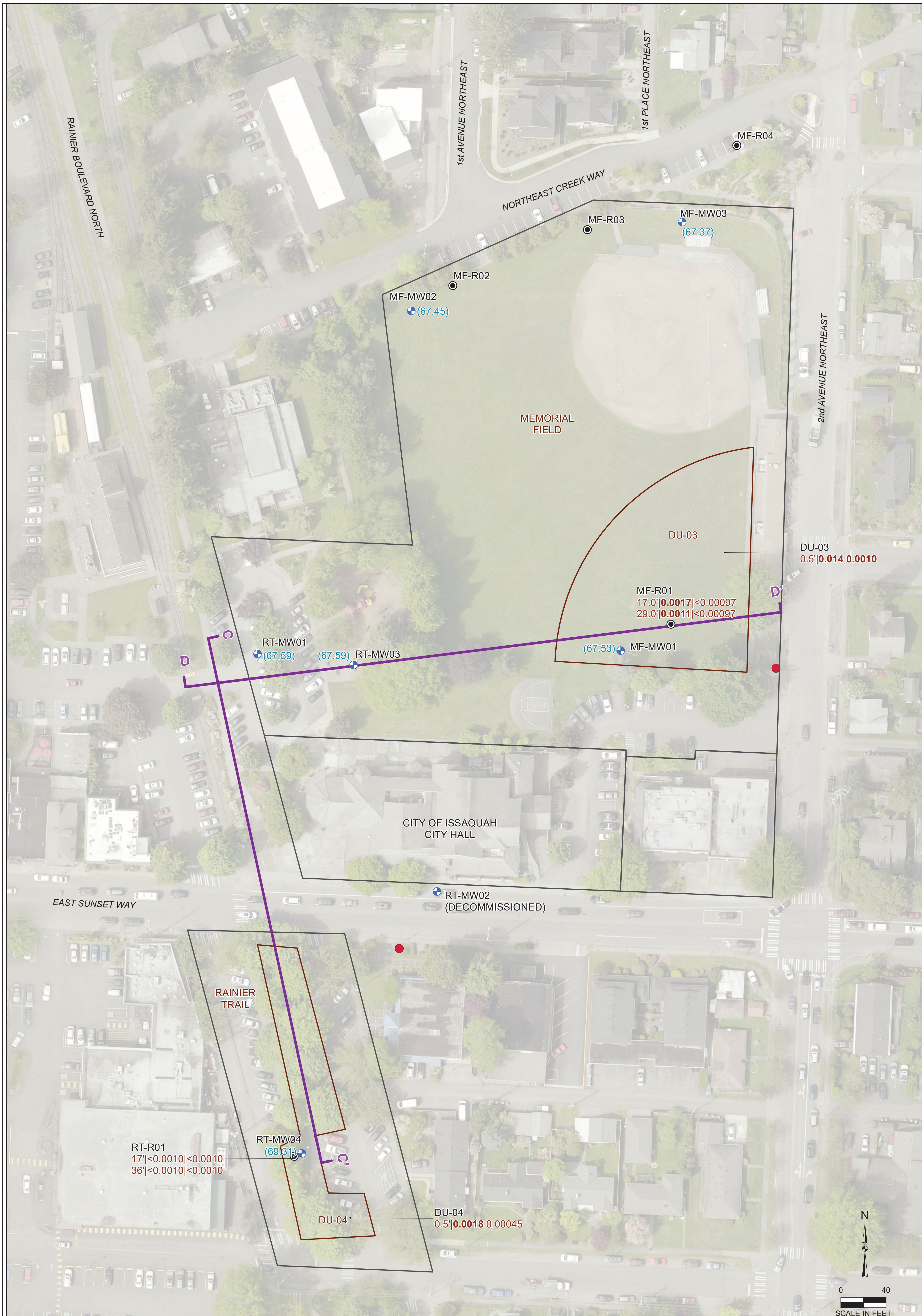

LEGEND

- BORING
- SHALLOW MONITORING WELL
- FIRE HYDRANT
- KING COUNTY PARCEL
- MIS DECISION UNIT
- C C' LINE OF CROSS-SECTION
- (66.59) GROUNDWATER ELEVATION (10/26/2018) REPORTED IN FEET - NORTH AMERICAN VERTICAL DATUM OF 1988

NOTES:

SAMPLE RESULTS HIGHLIGHTED IN BROWN REPRESENT SOIL SAMPLES

DEPTH AND CONCENTRATIONS REPORTED AS: SOIL SAMPLE DEPTH IN FEET BGS | PFOS | PFOA

ANALYTICAL RESULTS IN MILLIGRAMS PER KILOGRAM

MIS = MULTI-INCREMENTAL SAMPLE
PFAS = PER- AND POLY- FLUOROALKYL SUBSTANCES
PFOA = PERFLUOROOCTANOIC ACID
PFOS = PERFLUOROOCTANE SULFONIC ACID
BOLD = DENOTES CONCENTRATIONS EXCEEDING THE APPLICABLE WASHINGTON STATE DEPARTMENT OF ECOLOGY INVESTIGATORY LEVEL FOR PROTECTION OF GROUNDWATER FOR UNSATURATED SOIL
< = DENOTES ANALYTE NOT DETECTED AT OR EXCEEDING THE REPORTING LIMIT LISTED
BGS = BELOW GROUND SURFACE

ALL LOCATIONS ARE APPROXIMATE
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FIGURE 11

SOIL ANALYTICAL RESULTS
MEMORIAL FIELD AND RAINIER TRAIL AREA
PFAS CHARACTERIZATION STUDY
LOWER ISSAQUAH VALLEY
ISSAQUAH, WASHINGTON

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LEGEND

- BORING
- SHALLOW MONITORING WELL
- FIRE HYDRANT
- KING COUNTY PARCEL
- MIS DECISION UNIT
- (69.31) GROUNDWATER ELEVATION (10/26/2018) REPORTED IN FEET - NORTH AMERICAN VERTICAL DATUM OF 1988
- 69.00 APPROXIMATE GROUNDWATER ELEVATION CONTOUR (DASHED WHERE INFERRED)

NOTES:

SAMPLE RESULTS HIGHLIGHTED IN GREEN REPRESENT RECONNAISSANCE BORING TEMPORARY WELL GROUNDWATER RESULTS

SAMPLE RESULTS HIGHLIGHTED IN RED REPRESENT MONITORING WELL GROUNDWATER RESULTS

MIS = MULTI-INCREMENTAL SAMPLE
PFAS = PER- AND POLY- FLUOROALKYL SUBSTANCES
PFOA = PERFLUOROOCTANOIC ACID
PFOS = PERFLUOROOCTANE SULFONIC ACID
BOLD = DENOTE CONCENTRATIONS EXCEEDING THE APPLICABLE WASHINGTON STATE DEPARTMENT OF ECOLOGY INVESTIGATORY LEVEL OF 0.070 MICROGRAMS PER LITER
BGS = BELOW GROUND SURFACE

1. ALL LOCATIONS ARE APPROXIMATE.
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FIGURE 12

GROUNDWATER ANALYTICAL RESULTS
MEMORIAL FIELD AND RAINIER TRAIL AREA
PFAS CHARACTERIZATION STUDY
LOWER ISSAQUAH VALLEY
ISSAQUAH, WASHINGTON

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LEGEND

- BORING
- GEOSYNTEC SAMPLE
- SHALLOW MONITORING WELL
- KING COUNTY PARCEL
- MIS DECISION UNIT
- (66.59) GROUNDWATER ELEVATION (10/26/2018) REPORTED IN FEET - NORTH AMERICAN VERTICAL DATUM OF 1988
- E E' LINE OF CROSS-SECTION

NOTES:
SAMPLE RESULTS HIGHLIGHTED IN BROWN REPRESENT SOIL SAMPLES
DEPTH AND CONCENTRATIONS REPORTED AS:
SOIL SAMPLE DEPTH IN FEET BGS | PFOS | PFOA
ANALYTICAL RESULTS IN MILLIGRAMS PER KILOGRAM

MIS = MULTI-INCREMENTAL SAMPLE
PFAS = PER- AND POLY- AND FLUOROALKYL SUBSTANCES
PFOA = PERFLUOROOCTANOIC ACID
PFOS = PERFLUOROOCTANE SULFONIC ACID
AFFF = AQUEOUS FILM-FORMING FOAM

BOLD = DENOTES CONCENTRATIONS EXCEEDING THE APPLICABLE WASHINGTON STATE DEPARTMENT OF ECOLOGY INVESTIGATORY LEVEL FOR PROTECTION OF GROUNDWATER FOR UNSATURATED SOIL
< = DENOTES ANALYTE NOT DETECTED AT OR EXCEEDING THE REPORTING LIMIT LISTED
J = RESULT IS AN ESTIMATE
BGS = BELOW GROUND SURFACE

1. ALL LOCATIONS ARE APPROXIMATE.
2. FIGURES WERE PRODUCED IN COLOR. GRAYSCALE COPIES MAY NOT REPRODUCE ALL ORIGINAL INFORMATION.

0 20
SCALE IN FEET
N

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FIGURE 13
SOIL ANALYTICAL RESULTS
175 NEWPORT WAY NORTHWEST
PFAS CHARACTERIZATION STUDY
LOWER ISSAQUAH VALLEY
ISSAQUAH, WASHINGTON

FARALLON PN: 1754-002

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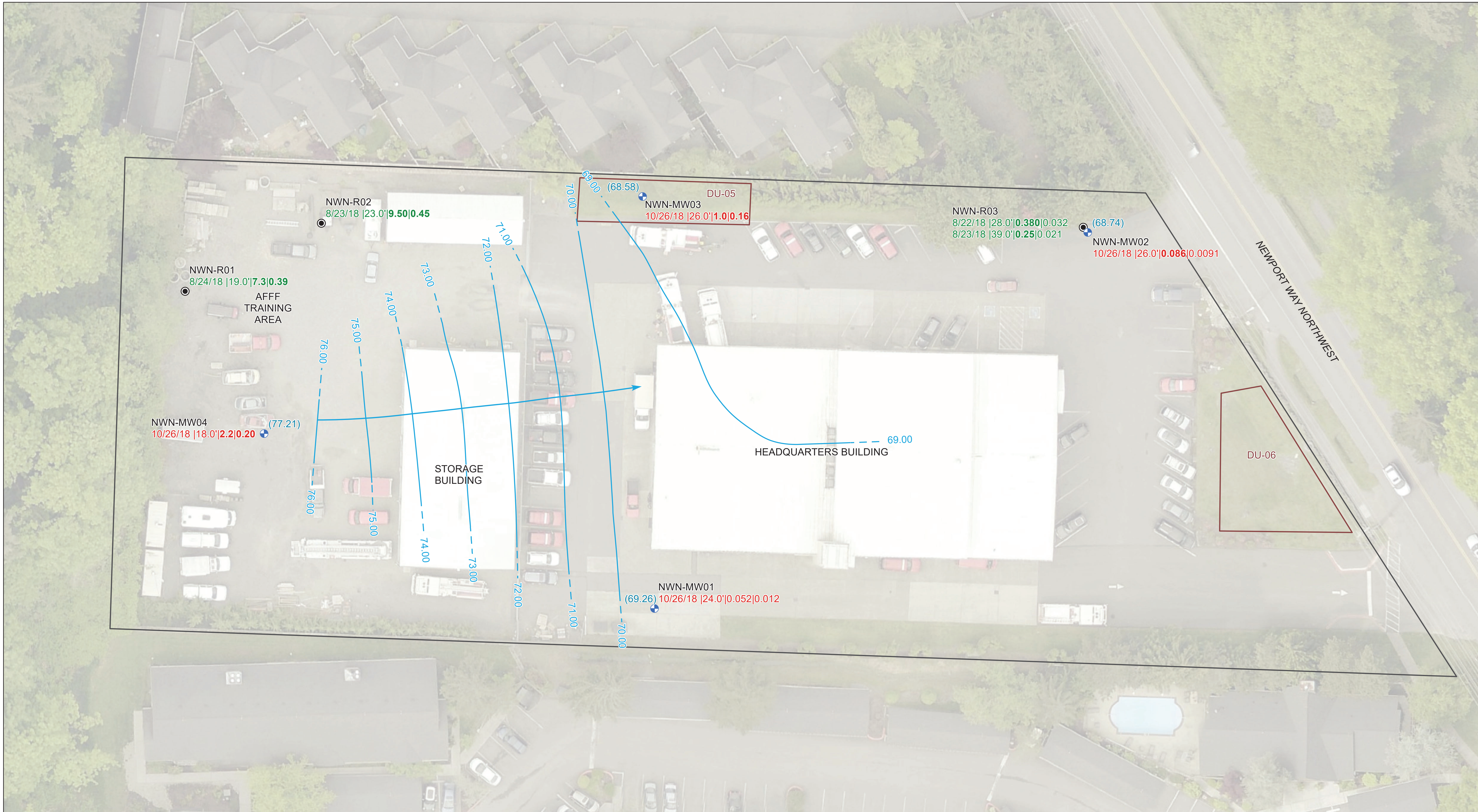

LEGEND

- BORING
- SHALLOW MONITORING WELL
- KING COUNTY PARCEL
- MIS DECISION UNIT

(66.59) GROUNDWATER ELEVATION (10/26/2018) REPORTED IN FEET - NORTH AMERICAN VERTICAL DATUM OF 1988

66.00 APPROXIMATE GROUNDWATER ELEVATION CONTOUR (DASHED WHERE INFERRED)

APPROXIMATE FLOW DIRECTION

NOTES:
SAMPLE RESULTS HIGHLIGHTED IN GREEN REPRESENT RECONNAISSANCE BORING TEMPORARY WELL GROUNDWATER RESULTS
SAMPLE RESULTS HIGHLIGHTED IN RED REPRESENT MONITORING WELL GROUNDWATER RESULTS
DEPTH AND CONCENTRATIONS REPORTED AS:
SAMPLE DATE | GROUNDWATER SAMPLE DEPTH IN FEET BGS | PFOS | PFOA
ANALYTICAL RESULTS IN MICROGRAMS PER LITER
1. ALL LOCATIONS ARE APPROXIMATE.
2. FIGURES WERE PRODUCED IN COLOR. GRAYSCALE COPIES MAY NOT REPRODUCE ALL ORIGINAL INFORMATION.

AFFF = AQUEOUS FILM-FORMING SOLUTION
MIS = MULTI-INCREMENTAL SAMPLE
PFAS = PER- AND POLY- FLUOROALKYL SUBSTANCES
PFOA = PERFLUOROOCTANOIC ACID
PFOS = PERFLUOROOCTANE SULFONIC ACID
BOLD = DENOTE CONCENTRATIONS EXCEEDING THE APPLICABLE WASHINGTON STATE DEPARTMENT OF ECOLOGY INVESTIGATORY LEVEL OF 0.070 MICROGRAMS PER LITER
< = DENOTES ANALYTE NOT DETECTED AT OR EXCEEDING THE REPORTING LIMIT LISTED
BGS = BELOW GROUND SURFACE

N

0 20
SCALE IN FEET

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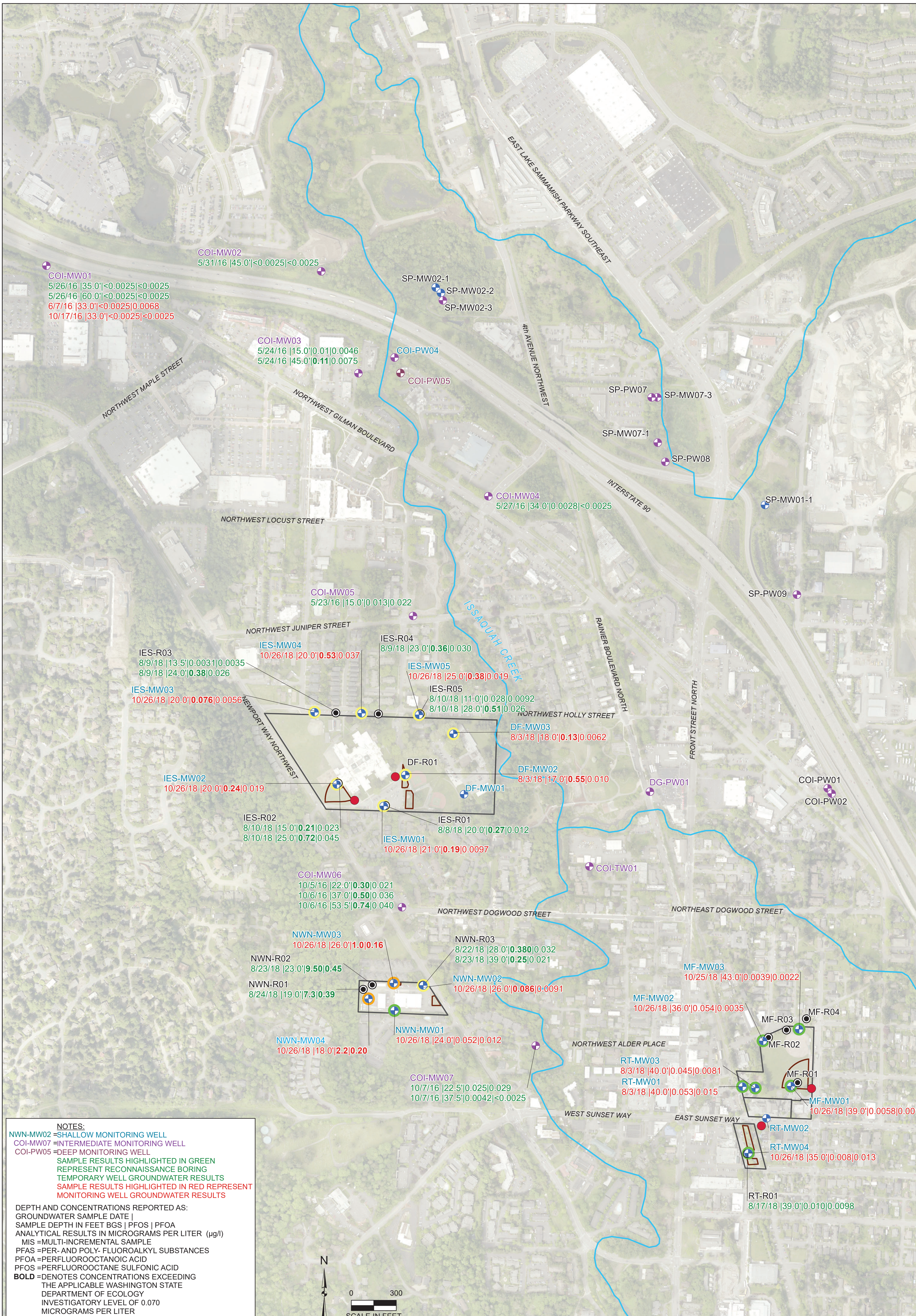
FIGURE 14

GROUNDWATER ANALYTICAL RESULTS
175 NEWPOERT WAY NORTHWEST
PFAS CHARACTERIZATION STUDY
LOWER ISSAQUAH VALLEY
ISSAQUAH, WASHINGTON

FARALLON PN: 1754-002

Drawn By: ebuer | Checked By: EB | Date: 3/22/2019 | Disc Reference:

Document Path: Q:\Projects\1754 EastsideFireRescue\1754-002 PFAS Characterization\Mapfiles\Summary_Rpt\Figure-14_GW_Analytical_NWN_w_contours.mxd



NOTES:

NWN-MW02 = SHALLOW MONITORING WELL
COI-MW07 = INTERMEDIATE MONITORING WELL
COI-PW05 = DEEP MONITORING WELL

SAMPLE RESULTS HIGHLIGHTED IN GREEN REPRESENT RECONNAISSANCE BORING TEMPORARY WELL GROUNDWATER RESULTS

SAMPLE RESULTS HIGHLIGHTED IN RED REPRESENT MONITORING WELL GROUNDWATER RESULTS

DEPTH AND CONCENTRATIONS REPORTED AS:
GROUNDWATER SAMPLE DATE |
SAMPLE DEPTH IN FEET BGS | PFOS | PFOA
ANALYTICAL RESULTS IN MICROGRAMS PER LITER (µg/l)

MIS = MULTI-INCREMENTAL SAMPLE
PFAS = PER- AND POLY- FLUOROALKYL SUBSTANCES
PFOA = PERFLUOROOCTANOIC ACID
PFOS = PERFLUOROOCTANE SULFONIC ACID
BOLD = DENOTES CONCENTRATIONS EXCEEDING THE APPLICABLE WASHINGTON STATE DEPARTMENT OF ECOLOGY INVESTIGATORY LEVEL OF 0.070 MICROGRAMS PER LITER
BGS = BELOW GROUND SURFACE

LEGEND

- BORING
- SHALLOW MONITORING WELL
- INTERMEDIATE MONITORING WELL
- DEEP MONITORING WELL
- SUM OF 2018 PFOA AND PFOS RESULTS LESS THAN OR EQUAL TO 0.070 µg/l
- SUM OF 2018 PFOA AND PFOS RESULTS BETWEEN 0.070 AND 0.70 µg/l
- SUM OF 2018 PFOA AND PFOS RESULTS GREATER THAN OR EQUAL TO 0.70 µg/l
- FIRE HYDRANT
- KING COUNTY PARCEL
- MIS DECISION UNIT

ALL LOCATIONS ARE APPROXIMATE.
FIGURES WERE PRODUCED IN COLOR. GRAYSCALE COPIES MAY NOT REPRODUCE ALL ORIGINAL INFORMATION.

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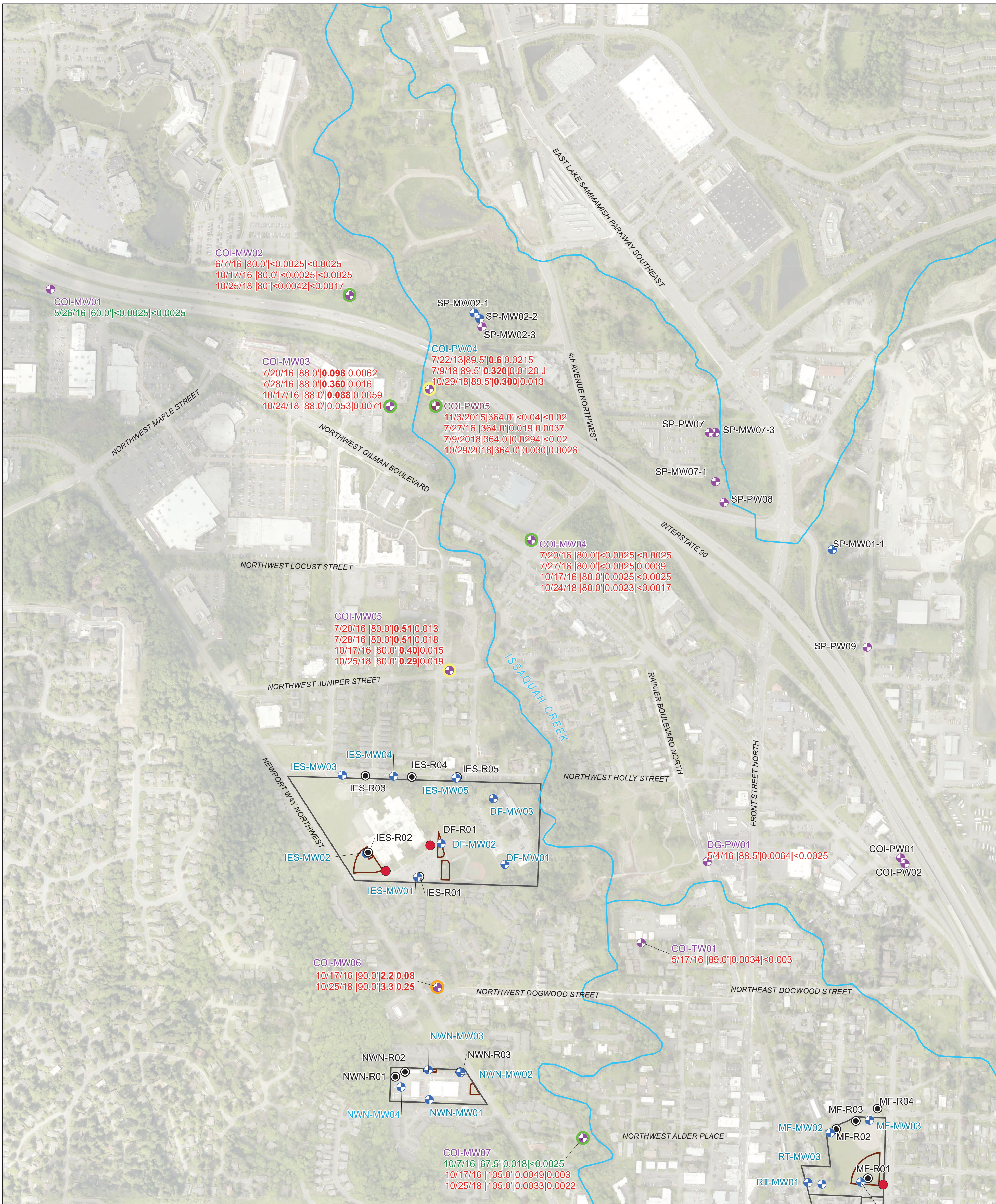
FIGURE 15

SHALLOW GROUNDWATER ANALYTICAL RESULTS
PFAS CHARACTERIZATION STUDY
SUMMARY REPORT
LOWER ISSAQUAH VALLEY
ISSAQUAH, WASHINGTON

FARALLON PN: 1754-002

Drawn By: jjones | Checked By: EB | Date: 3/21/2019 | Disc Reference:

Document Path: Q:\Projects\1754 EastsideFireRescue\1754-002 PFAS Characterization\Mapfiles\Summary_Rpt\Figure-15_GW_Analytical_ValleyWide_Shallow.mxd



NOTES:

NWN-MW02 = SHALLOW MONITORING WELL
COI-MW07 = INTERMEDIATE MONITORING WELL
COI-PW05 = DEEP MONITORING WELL
SAMPLE RESULTS HIGHLIGHTED IN GREEN REPRESENT RECONNAISSANCE BORING TEMPORARY WELL GROUNDWATER RESULTS
SAMPLE RESULTS HIGHLIGHTED IN RED REPRESENT MONITORING WELL GROUNDWATER RESULTS

DEPTH AND CONCENTRATIONS REPORTED AS:
GROUNDWATER SAMPLE DATE |
SAMPLE DEPTH IN FEET BGS | PFOS | PFOA
ANALYTICAL RESULTS IN MICROGRAMS PER LITER

MIS = MULTI-INCREMENTAL SAMPLE
PFAS = PER- AND POLY- FLUOROALKYL SUBSTANCES
PFOA = PERFLUOROOCTANOIC ACID
PFOS = PERFLUOROOCTANE SULFONIC ACID
BOLD = DENOTES CONCENTRATIONS EXCEEDING THE APPLICABLE WASHINGTON STATE DEPARTMENT OF ECOLOGY INVESTIGATORY LEVEL OF 0.070 MICROGRAMS PER LITER
BGS = BELOW GROUND SURFACE
J = RESULT AN ESTIMATE

LEGEND

- BORING
- SHALLOW MONITORING WELL
- INTERMEDIATE MONITORING WELL
- DEEP MONITORING WELL
- SUM OF 2018 PFOA AND PFOS RESULTS LESS THAN OR EQUAL TO 0.070 µg/l
- SUM OF 2018 PFOA AND PFOS RESULTS BETWEEN 0.070 AND 0.70 µg/l
- SUM OF 2018 PFOA AND PFOS RESULTS GREATER THAN OR EQUAL TO 0.70 µg/l
- FIRE HYDRANT
- KING COUNTY PARCEL
- MIS DECISION UNIT

ALL LOCATIONS ARE APPROXIMATE.
FIGURES WERE PRODUCED IN COLOR. GRAYSCALE COPIES MAY NOT REPRODUCE ALL ORIGINAL INFORMATION.

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FIGURE 16

INTERMEDIATE AND DEEP GROUNDWATER ANALYTICAL RESULTS
PFAS CHARACTERIZATION STUDY
SUMMARY REPORT
LOWER ISSAQUAH VALLEY
ISSAQUAH, WASHINGTON

FARALLON PN: 1754-002

Drawn By: jjones | Checked By: EB | Date: 3/21/2019 | Disc Reference:

Document Path: Q:\Projects\1754 EastsideFireRescue\1754-002 PFAS Characterization\Mapfiles\Summary_Rpt\Figure-16_GW_Analytical_ValleyWide_Intermediate.mxd

TABLES

PER- AND POLY-FLUOROALKYL SUBSTANCES
CHARACTERIZATION STUDY SUMMARY REPORT
Lower Issaquah Valley
Issaquah, Washington

Farallon PN: 1754-002

Table 1
Monitoring Well Construction
PFAS Characterization Study
Issaquah, Washington
Farallon PN: 1754-002

Well ID	Previous Monitoring Well ID	Well Owner	Ground Surface Elevation (feet NAVD88)	Top of Casing Elevation (feet NAVD88)	Top of Screen (feet bgs)	Bottom of Screen (feet bgs)	Screened Length (feet)	Screen Top Elevation (feet NAVD88)	Screen Bottom Elevation (feet NAVD88)
Water Production Wells									
COI-PW01	Well 1	City of Issaquah	NM	92.57	90	106	16	2.57	-13.43
COI-PW02	Well 2	City of Issaquah	NM	93.06	82	97	15	11.06	-3.94
COI-PW04	Well 4	City of Issaquah	NM	66.19	77	102	25	-10.81	-35.81
COI-PW05	Well 5	City of Issaquah	NM	67.16	323	405	82	-255.84	-337.84
SP-PW07	SPWSD Well 7	Sammamish Plateau	NM	70.19	82.6	146.9	64.3	-12.41	-76.71
SP-PW08	SPWSD Well 8	Sammamish Plateau	NM	73.94	105	179	74	-31.06	-105.06
SP-PW09	SPWSD Well 9	Sammamish Plateau	NM	77.65	194	219	25	-116.35	-141.35
DG-PW01	ABY249	Darigold	NM	85.29	81	96	15	4.29	-10.71
Resource Protection Monitoring Wells									
Issaquah Valley Elementary West Playfield Area of Interest									
IES-MW01	---	Issaquah School District	76.52	76.31	16	26	10	60.31	50.31
IES-MW02	---	Issaquah School District	74.43	73.74	15	25	10	58.74	48.74
IES-MW03	---	Issaquah School District	73.09	72.70	15	25	10	57.7	47.7
IES-MW04	---	Issaquah School District	72.97	72.43	15	30	15	57.43	42.43
Dodd Fields Park Area of Interest									
IES-MW05	---	Issaquah School District	72.75	72.76	20	30	10	52.76	42.76
DF-MW01	EB-1W	Issaquah School District	77.99	77.71	5	15	10	72.71	62.71
DF-MW02	EB-5W	Issaquah School District	74.57	74.21	15	25	10	59.21	49.21
DF-MW03	EB-3W	Issaquah School District	74.71	74.35	20	30	10	54.35	44.35
Rainier Trail Area of Interest									
RT-MW01	MW-01	City of Issaquah	99.13	98.67	25	45	20	73.67	53.67
RT-MW03	MW-02	City of Issaquah	99.39	99.06	25	45	20	74.06	54.06
RT-MW04	---	City of Issaquah	101.00	100.76	28	38	10	72.76	62.76
Memorial Field									
MF-MW01	---	City of Issaquah	102.88	102.57	16	26	10	86.57	76.57
MF-MW02	---	City of Issaquah	100.16	99.51	25	45	20	74.51	54.51
MF-MW03	---	City of Issaquah	104.36	104.17	35	50	15	69.17	54.17
175 Newport Way Northwest									
NWN-MW01	---	Easrside Fire & Rescue	90.93	90.69	15	30	15	75.69	60.69
NWN-MW02	---	Easrside Fire & Rescue	90.04	89.84	15	30	15	74.84	59.84
NWN-MW03	---	Easrside Fire & Rescue	91.60	91.35	15	30	15	76.35	61.35
NWN-MW04	---	Easrside Fire & Rescue	90.68	90.41	13	23	10	77.41	67.41

Table 1
Monitoring Well Construction
PFAS Characterization Study
Issaquah, Washington
Farallon PN: 1754-002

Well ID	Previous Monitoring Well ID	Well Owner	Ground Surface Elevation (feet NAVD88)	Top of Casing Elevation (feet NAVD88)	Top of Screen (feet bgs)	Bottom of Screen (feet bgs)	Screened Length (feet)	Screen Top Elevation (feet NAVD88)	Screen Bottom Elevation (feet NAVD88)
Lower Valley Wells									
COI-TW01	COI-MW1	City of Issaquah	NM	64.54	84	94	10	-19.46	-29.46
COI-TW03	COI-TW3	City of Issaquah	NM	81.8	NM	NM	NM	NM	NM
COI-MW01	MW01	City of Issaquah	58.36	58.4	28	38	10	30.4	20.4
COI-MW02	MW02	City of Issaquah	59.7	62.8	70	90	20	-7.2	-27.2
COI-MW03	MW03	City of Issaquah	63.16	62.9	78	98	20	-15.1	-35.1
COI-MW04	MW04	City of Issaquah	73.3	73.1	70	90	20	3.1	-16.9
COI-MW05	MW05	City of Issaquah	72.05	71.9	70	90	20	1.9	-18.1
COI-MW06	MW06	City of Issaquah	86.5	86.3	80	100	20	6.3	-13.7
COI-MW07	MW07	City of Issaquah	90.7	90.3	100	110	10	-9.7	-19.7
COI-PW05-OBS	COI Well5OBS	City of Issaquah	NM	NM	NM	NM	NM	NM	NM
SP-MW01-1	SPVT1-1	Sammamish Plateau	73.16	NM	28	38	10	45.16	35.16
SP-MW01-2	SPVT1-2	Sammamish Plateau	73.16	NM	70	80	10	3.16	-6.84
SP-MW01-3	SPVT1-3	Sammamish Plateau	73.16	NM	150	160	10	-76.84	-86.84
SP-MW02-1	SPVT2-1	Sammamish Plateau	59.35	59.4	19	24	5	40.35	35.35
SP-MW02-2	SPVT2-2	Sammamish Plateau	61.87	61.8	34	39	5	27.87	22.87
SP-MW02-3	SPVT2-3	Sammamish Plateau	62.14	62.0	74	79	5	-11.86	-16.86
SP-MW07-1	SP7-1	Sammamish Plateau	72.3	NM	35	58	23	37.3	14.3
SP-MW07-2	SP7-2	Sammamish Plateau	72.3	NM	135	220	85	-62.7	-147.7
SP-MW07-3	SP7-3	Sammamish Plateau	70.1	72.1	85	150	65	-14.9	-79.9

NOTES:
— denotes not applicable.

bgs = below ground surface
NAVD88 = North American Vertical Datum of 1988
NM = not measured
Sammamish Plateau = Sammamish Plateau Water and Sewer District

Table 2
Summary of Groundwater Elevation Data
PFAS Characterization Study
Issaquah, Washington
Farallon PN: 1754-002

Location	Date Measured	Well Head Elevation (feet)[1]	Depth to Water (feet)[2]	Groundwater Elevation (feet)[1]
Issaquah Valley Elementary West Playfield Area of Interest				
IES-MW01	10/26/2018	76.31	7.52	68.79
IES-MW02	10/26/2018	73.74	7.15	66.59
IES-MW03	10/26/2018	72.70	7.74	64.96
IES-MW04	10/26/2018	72.43	6.79	65.64
Dodd Fields Park Area of Interest				
IES-MW05	10/26/2018	72.26	9.68	62.58
DF-MW01	10/26/2018	77.71	10.99	66.72
DF-MW02	8/3/2018	74.21	10.05	64.16
	10/26/2018		8.10	66.11
DF-MW03	8/3/2018	74.35	10.09	64.26
Memorial Field Area of Interest				
MF-MW01	10/26/2018	102.57	35.04	67.53
MF-MW02	10/26/2018	99.51	32.06	67.45
MF-MW03	10/25/2018	104.17	36.80	67.37
Rainier Trail Area of Interest				
RT-MW01	8/3/2018	98.67	35.58	63.09
	10/26/2018		31.08	67.59
RT-MW03	8/3/2018	99.06	36.02	63.04
	10/26/2018		31.47	67.59
RT-MW04	10/26/2018	100.76	31.45	69.31

Table 2
Summary of Groundwater Elevation Data
PFAS Characterization Study
Issaquah, Washington
Farallon PN: 1754-002

Location	Date Measured	Well Head Elevation (feet)[1]	Depth to Water (feet)[2]	Groundwater Elevation (feet)[1]
175 Newport Way Northwest				
NWN-MW01	10/26/2018	90.69	21.43	69.26
NWN-MW02	10/26/2018	89.84	21.10	68.74
NWN-MW03	10/26/2018	91.35	22.77	68.58
NWN-MW04	10/26/2018	90.41	13.20	77.21
Lower Valley Issaquah Wells				
COI-MW02	10/26/2018	62.80	3.71	59.09
COI-MW03	10/24/2018	62.90	5.92	56.98
COI-MW04	10/24/2018	73.10	10.20	62.90
COI-MW05	10/25/2018	71.90	8.09	63.81
COI-MW06	10/25/2018	86.30	18.62	67.68
COI-MW07	10/25/2018	90.30	19.44	70.86

NOTES:
[1] Elevations reported in North American Vertical Datum of 1988.
[2] In feet below top of well casing.

Farallon = Farallon Consulting, L.L.C.

Table 3
AFFF Training Periods and Frequency for Areas of Interest
PFAS Characterization Study
Issaquah, Washington
Farallon PN: 1754-002

Area of Concern	Decision Unit	Approximate Start of Training	Approximate End of Training	Estimated Years of Use	Estimated Number of Training Events Annually [1]	Estimated Total Number of Training Events	Notes
Issaquah Valley Elementary West Playfield	DU-1A	Early 1970s	Early 1980s	10	2	20	Decision unit located at low point with drain in former training area.
	DU-1B	Early 1970s	Early 1980s	10	2	20	Decision unit comprises field area outside of DU-1A in former training area.
Dodd Fields Park	DU-2A	Early 1970s	Early 1980s	10	2	20	Decision unit delineated over primary suspected area for AFFF nozzle spray training.
	DU-2B	Early 1970s	Early 1980s	10	2	20	Decision unit suspected to receive AFFF nozzle training spray and washdown water.
Memorial Field	DU-03	Early 1980s	Mid-1990s	15	2	30	Decision unit comprises entire field where former training was performed.
Rainier Trail	DU-04	Early 1970s	Early 1980s	10	1	10	Decision unit comprises two landscaped areas within former training area on former rail grade.
175 Newport Way Northwest	DU-05	Early 1980s	Late 1990s	20	12	240	Decision unit comprises grass median where periodic former training was performed.
	DU-06	---	---	---	---	---	Stormwater retention basin, multi-incremental sampling performed to evaluate potential impacts associated with facility runoff.

NOTES:
— denotes not applicable.
[1] Approximately 1 to 3 buckets of AFFF concentrate solution were used per training event.

AFFF = aqueous film-forming foam

Table 4
Soil Analytical Results for Short-Chain PFAS
PFAS Characterization Study
Issaquah, Washington
Farallon PN: 1754-002

Sample Location	Sampled By	Sample Date	Sample Identification	Sample Type	Zone	Sample Depth (feet)[1]	Analytical Results (milligrams per kilogram)[1] Perfluorobutanoic Acid (PFBA)	Perfluorobutane Sulfonic Acid (PFBS)	Perfluorohexanoic Acid (PFHxA)	Perfluorohexane Sulfonic Acid (PFHxS)	Perfluoroheptanoic Acid (PFHpA)	Perfluoroheptane Sulfonic Acid (PFHpS)
2016 Hydrogeological Characterization Investigation												
175 Newport Way Northwest Area of Interest												
STSP01	Geosyntec	7/22/2016	COI-STSP01-20160722	Discrete	Unsaturated	2.2 - 2.3	---	< 0.0019	0.00058	< 0.0019	< 0.00072	---
STTA01	Geosyntec	7/22/2016	COI-STTA01-20160722	Discrete	Unsaturated	2.2 - 2.3	---	0.0089	0.03	0.08	0.0051	---
STTA02	Geosyntec	7/22/2016	COI-STTA02-20160722	Discrete	Unsaturated	3.8 - 3.9	---	0.0045	0.015	0.025	0.0021	---
	Geosyntec	7/22/2016	COI-STTA02-20160722-DUP	Discrete	Unsaturated	3.8 - 3.9	---	0.0054	0.019	0.029	0.0024	---
2018 Subsurface Investigation												
Issaquah Valley Elementary West Playfield Area of Interest												
DU-1A	Farallon	8/6/2018	DU-1A-COMPOSITE	MI	Unsaturated	0.0 - 0.5	0.00037	< 0.00082	0.00072	0.00022	< 0.00082	< 0.00082
DU-1B	Farallon	8/7/2018	DU-1B-COMPOSITE	MI	Unsaturated	0.0 - 0.5	< 0.00098	< 0.00098	0.00024 J	0.00017 J	< 0.00098	< 0.00098
IES-R02	Farallon	8/10/2018	IES-R02-180810-12	Discrete	Unsaturated	12.0	< 0.00097	< 0.00097	< 0.00097	< 0.00097	< 0.00097	< 0.00097
	Farallon	8/10/2018	IES-R02-180810-23	Discrete	Saturated	23.0	< 0.00096	< 0.00096	< 0.00096	0.0002	< 0.00096	< 0.00096
Dodd Fields Park Area of Interest												
DU-2A	Farallon	8/8/2018	DU-2A-COMPOSITE	MI	Unsaturated	0.0 - 0.5	0.0010	< 0.0010	0.00096 J	0.0024	0.00032 J	0.00055 J
DU-2B	Farallon	8/9/2018	DU-2B-COMPOSITE	MI	Unsaturated	0.0 - 0.5	< 0.00096	< 0.00096	0.00026 J	0.00086 J	< 0.00096	< 0.00096
DF-R01	Farallon	9/6/2018	DF-R01-180906-3.5	Discrete	Unsaturated	3.5	0.00044 J	< 0.0012	0.00049 J	0.0036	< 0.0012	< 0.0012
Rainier Trail Area of Interest												
DU-04	Farallon	8/13/2018	DU-04-COMPOSITE	MI	Unsaturated	0.0 - 0.5	0.00038 J	< 0.0010	0.00026 J	0.00024 J	< 0.0010	< 0.0010
RT-R01	Farallon	8/17/2018	RT-01-180817-17	Discrete	Unsaturated	17.0	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
	Farallon	8/17/2018	RT-01-180817-36	Discrete	Saturated	36.0	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Memorial Field Area of Interst												
DU-03	Farallon	8/10/2018	DU-03-COMPOSITE	MI	Unsaturated	0.0 - 0.5	0.00093 J	< 0.0010	0.00052 J	0.0020	0.00026 J	< 0.0010
MF-R01	Farallon	8/21/2018	MF-R01-180821-17.0	Discrete	Unsaturated	17.0	< 0.00097	< 0.00097	< 0.00097	0.00017 J	< 0.00097	< 0.00097
	Farallon	8/21/2018	MF-R01-180821-29.0	Discrete	Unsaturated	29.0	< 0.00097	< 0.00097	0.00050 J	0.00033 J	< 0.00097	< 0.00097
175 Newport Way Northwest Area of Interest												
DU-05	Farallon	8/14/2018	DU-05-COMPOSITE	MI	Unsaturated	0.0 - 0.5	0.00061 J	0.00019 J	0.00068 J	0.0039	< 0.0010	< 0.0010
DU-06	Farallon	8/15/2018	DU-06 COMPOSITE	MI	Unsaturated	0.0 - 0.5	0.00088 J	0.00021 J	0.0014	0.0049	0.00043 J	0.00042 J
NWN-MW02	Farallon	10/18/2018	NWN-MW02-181018-10	Discrete	Unsaturated	10.0	< 0.00096	< 0.00096	< 0.00096	< 0.00096	< 0.00096	< 0.00096
	Farallon	10/18/2018	NWN-MW02-181018-19	Discrete	Unsaturated	19.0	< 0.0010	< 0.0010	< 0.0010	0.00026 J	< 0.0010	< 0.0010
NWN-MW03	Farallon	10/18/2018	NWN-MW03-181018-12	Discrete	Unsaturated	12.0	< 0.0013	< 0.0013	0.00039 J	0.0036	< 0.0013	< 0.0013
	Farallon	10/18/2018	NWN-MW03-181018-25	Discrete	Unsaturated	25.0	< 0.0010	< 0.0010	0.00028 J	0.00045 J	< 0.0010	< 0.0010
NWN-MW04	Farallon	10/19/2018	NWN-MW04-181019-5	Discrete	Unsaturated	5.0	0.00068 J	0.00081 J	0.0039	0.0061	0.00060 J	0.00054 J
	Farallon	10/19/2018	NWN-MW04-181019-DUP	Discrete	Unsaturated	5.0	0.00044 J	0.00073 J	0.0025	0.0049	0.00050 J	0.00069 J
	Farallon	10/19/2018	NWN-MW04-181019-13	Discrete	Unsaturated	13.0	< 0.0012	< 0.0012	0.00027 J	0.00059 J	< 0.0012	< 0.0012
Investigatory Screening Levels							**NE**	**NE**	**NE**	**NE**	**NE**	**NE**

NOTES:
< denotes analyte not detected at or exceeding the reporting limit listed.
— denotes sample not analyzed.
[1]Depth in feet below ground surface.
[2]Samples collected in 2016 analyzed by U.S. Environmental Protection Agency (EPA) Method 537; samples collected in 2018 analyzed by EPA Method 537 Modified.

Farallon = Farallon Consulting, L.L.C.
Geosyntec = Geosyntec Consultants, Inc.
J = result is an estimate
MI = multi-incremental
NE = not established
PFAS = per- and poly-fluoroalkyl substances

Table 5
Soil Analytical Results for Long-Chain PFAS
PFAS Characterization Study
Issaquah, Washington
Farallon PN: 1754-002

							Analytical Results (milligrams per kilogram)[1]							
Sample Location	**Sampled By**	**Sample Date**	**Sample Identification**	**Sample Type**	**Zone**	**Sample Depth (feet)[1]**	**Perfluorooctanoic Acid (PFOA)**	**Perfluorooctane Sulfonic Acid (PFOS)**	**Sum of PFOA and PFOS**	**Perfluorononanoic Acid (PFNA)**	**Perfluorodecanoic Acid (PFDA)**	**Perfluorodecane Sulfonic Acid (PFDS)**	**Perfluoroundecanoic Acid (PFUnDA)**	**Perfluorododecanoic Acid (PFDoDA)**
2016 Hydrogeological Characterization Investigation														
175 Newport Way Northwest Area of Interest														
STSP01	Geosyntec	7/22/2016	COI-STSP01-20160722	Discrete	Unsaturated	2.2 - 2.3	< 0.00072	**0.023**	0.023	0.00077	0.0012	---	0.001	< 0.00096
STTA01	Geosyntec	7/22/2016	COI-STTA01-20160722	Discrete	Unsaturated	2.2 - 2.3	**0.011**	**1.3**	1.311	0.0097	< 0.00054	---	0.0028	< 0.0011
STTA02	Geosyntec	7/22/2016	COI-STTA02-20160722	Discrete	Unsaturated	3.8 - 3.9	**0.0043**	**0.18**	0.1843	0.033	0.0039	---	0.036	< 0.0011
	Geosyntec	7/22/2016	COI-STTA02-20160722-DUP	Discrete	Unsaturated	3.8 - 3.9	**0.0052**	**0.25**	0.2552	0.043	0.0045	---	0.063	< 0.0012
2018 Subsurface Investigation														
Issaquah Valley Elementary School West Playfield Area of Interest														
DU-1A	Farallon	8/6/2018	DU-1A-COMPOSITE	MI	Unsaturated	0.0 - 0.5	**0.0011**	**0.0028**	0.0039	0.00034	0.0015	0.00091	0.0003	0.00034
DU-1B	Farallon	8/7/2018	DU-1B-COMPOSITE	MI	Unsaturated	0.0 - 0.5	**0.00053**	**0.0024**	0.00293	< 0.00098	0.0005	0.0013	0.00032	< 0.00098
IES-R02	Farallon	8/10/2018	IES-R02-180810-12	Discrete	Unsaturated	12.0	< 0.00097	< 0.00097	< 0.00194	< 0.00097	< 0.00097	< 0.00097	< 0.00097	< 0.00097
	Farallon	8/10/2018	IES-R02-180810-23	Discrete	Saturated	23.0	< 0.00096	**0.00055**	0.00055	< 0.00096	< 0.00096	< 0.00096	< 0.00096	< 0.00096
Dodd Fields Park Area of Interest														
DU-2A	Farallon	8/8/2018	DU-2A-COMPOSITE	MI	Unsaturated	0.0 - 0.5	**0.00094** J	**0.085**	0.08594	0.0011	0.00082 J	< 0.0010	0.012	0.00064 J
DU-2B	Farallon	8/9/2018	DU-2B-COMPOSITE	MI	Unsaturated	0.0 - 0.5	0.00042 J	**0.016**	0.01642	< 0.00096	0.00028 J	< 0.00096	0.0037	< 0.00096
DF-R01	Farallon	9/6/2018	DF-R01-180906-3.5	Discrete	Unsaturated	3.5	0.00040 J	**0.043**	0.0434	0.0072	0.00037 J	0.00022 J	0.021	< 0.0012
Rainier Trail Area of Interest														
DU-04	Farallon	8/13/2018	DU-04-COMPOSITE	MI	Unsaturated	0.0 - 0.5	**0.00045** J	**0.0018**	0.00225	< 0.0010	0.00076 J	0.00031 J	< 0.0010	< 0.0010
RT-R01	Farallon	8/17/2018	RT-01-180817-17	Discrete	Unsaturated	17.0	< 0.0010	< 0.0010	< 0.0020	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
	Farallon	8/17/2018	RT-01-180817-36	Discrete	Saturated	36.0	< 0.0010	< 0.0010	< 0.0020	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Memorial Field Area of Interst														
DU-03	Farallon	8/10/2018	DU-03-COMPOSITE	MI	Unsaturated	0.0 - 0.5	**0.0010**	**0.014**	0.015	0.0018	0.00079 J	< 0.0010	0.033	0.00083 J
MF-R01	Farallon	8/21/2018	MF-R01-180821-17.0	Discrete	Unsaturated	17.0	< 0.00097	**0.0017**	0.0017	0.00033 J	< 0.00097	< 0.00097	0.0011	< 0.00097
	Farallon	8/21/2018	MF-R01-180821-29.0	Discrete	Unsaturated	29.0	< 0.00097	**0.0011**	0.0011	< 0.00097	< 0.00097	< 0.00097	< 0.00097	< 0.00097
175 Newport Way Northwest Area of Interest														
DU-05	Farallon	8/14/2018	DU-05-COMPOSITE	MI	Unsaturated	0.0 - 0.5	**0.00077** J	**0.024**	0.02477	0.00057 J	0.00039 J	0.00087 J	0.00069 J	< 0.0010
DU-06	Farallon	8/15/2018	DU-06 COMPOSITE	MI	Unsaturated	0.0 - 0.5	**0.0015**	**0.026**	0.0275	0.00063 J	0.00093 J	0.0019	0.0023	0.0010
NWN-MW02	Farallon	10/18/2018	NWN-MW02-181018-10	Discrete	Unsaturated	10.0	< 0.00096	< 0.00096	< 0.00192	< 0.00096	< 0.00096	< 0.00096	< 0.00096	< 0.00096
	Farallon	10/18/2018	NWN-MW02-181018-19	Discrete	Unsaturated	19.0	< 0.0010	**0.0064**	0.0064	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
NWN-MW03	Farallon	10/18/2018	NWN-MW03-181018-12	Discrete	Unsaturated	12.0	0.00036 J	**0.056**	0.05636	< 0.0013	< 0.0013	< 0.0013	< 0.0013	< 0.0013
	Farallon	10/18/2018	NWN-MW03-181018-25	Discrete	Unsaturated	25.0	0.00021 J	**0.0064**	0.00661	0.00023 J	< 0.0010	< 0.0010	0.0012	< 0.0010
NWN-MW04	Farallon	10/19/2018	NWN-MW04-181019-5	Discrete	Unsaturated	5.0	**0.0017**	**0.086**	0.0877	0.0025	< 0.0013	< 0.0013	0.0023	< 0.0013
	Farallon	10/19/2018	NWN-MW04-181019-DUP	Discrete	Unsaturated	5.0	**0.0015**	**0.088**	0.0895	0.0019	< 0.0014	< 0.0014	0.0019	< 0.0014
	Farallon	10/19/2018	NWN-MW04-181019-13	Discrete	Unsaturated	13.0	0.00034 J	**0.016**	0.01634	0.00048 J	< 0.0012	0.00029 J	0.0039	< 0.0012
Investigatory Screening Levels: Human Contact - Industrial							**70**	**70**	**70**	**NE**	**NE**	**NE**	**NE**	**NE**
Investigatory Screening Levels: Human Contact - Unrestricted							**1.6**	**1.6**	**1.6**	**NE**	**NE**	**NE**	**NE**	**NE**
Investigatory Screening Levels: Leaching from Unsaturated Zone							**0.00044**	**0.00088**	**---**	**NE**	**NE**	**NE**	**NE**	**NE**
Investigatory Screening Levels: Leaching from Saturated Zone							**0.000028**	**0.000046**	**---**	**NE**	**NE**	**NE**	**NE**	**NE**

NOTES:

Results in **bold** denote concentrations exceeding applicable Washington State Department of Ecology Investigatory Levels.

< denotes analyte not detected at or exceeding the reporting limit listed.

— denotes sample not analyzed.

[1]Depth in feet below ground surface.

[2]Analyzed by U.S. Environmental Protection Agency Method 537 Modified.

Farallon = Farallon Consulting, L.L.C.

Geosyntec = Geosyntec Consultants, Inc.

J = result is an estimate

MI = multi-incremental

NE = not established

PFAS = per- and poly-fluoroalkyl substances

Table 6
Reconnaissance Groundwater Analytical Results for Short-Chain PFAS
PFAS Characterization Study
Issaquah, Washington
Farallon PN: 1754-002

Sample Location	Sampled By	Sample Date	Sample Identification	Sample Depth (feet)[1]	Analytical Results (micrograms per liter)[1]					
					Perfluorobutanoic Acid (PFBA)	Perfluorobutane Sulfonic Acid (PFBS)	Perfluorohexanoic Acid (PFHxA)	Perfluorohexane Sulfonic Acid (PFHxS)	Perfluoroheptanoic Acid (PFHpA)	Perfluoroheptane Sulfonic Acid (PFHpS)
Lower Issaquah Valley										
2016 Hydrogeological Characterization Investigation										
COI-MW01	Geosyntec	5/26/2016	MW01_30 TO 40_20160526	30 - 40	---	< 0.0025	< 0.0025	< 0.0025	< 0.0025	---
	Geosyntec	5/26/2016	MW01_55 TO 65_20160526	55 - 65	---	< 0.0025	< 0.0025	< 0.0025	< 0.0025	---
COI-MW02	Geosyntec	5/31/2016	MW02_40TO50_20160531	40 - 50	---	0.0073	0.0051	0.0077	< 0.0025	---
COI-MW03	Geosyntec	5/24/2016	MW03_10 TO 20_20160524	10 - 20	---	0.019	0.012	0.031	0.0051	---
	Geosyntec	5/24/2016	MW03_40 TO 50_20160524	40 - 50	---	0.036	0.021	0.08	0.0086	---
COI-MW04	Geosyntec	5/27/2016	MW04_29 TO 39_20160527	29 - 39	---	0.0051	< 0.0025	0.0084	< 0.0025	---
COI-MW05	Geosyntec	5/23/2016	MW05_10 TO 20_20160523	10 - 20	---	0.03	0.036	0.039	0.016	---
COI-MW06	Geosyntec	10/5/2016	COI-MW06-20161005-19.5-24.5	19.5 - 24.5	---	0.03	0.061	0.14	0.026	---
	Geosyntec	10/6/2016	COI-MW06-20161006-34.5-39.5	34.5 - 39.5	---	0.052	0.1	0.24	0.044	---
	Geosyntec	10/6/2016	COI-MW06-20161006-51-56	51 - 56	---	0.073	0.13	0.3	0.05	---
COI-MW07	Geosyntec	10/7/2016	COI-MW07-20161007-20-25	20 - 25	---	0.0044	0.011	0.0094	0.0076	---
	Geosyntec	10/7/2016	COI-MW07-20161007-35-40	35 - 40	---	< 0.0025	< 0.0025	< 0.0025	< 0.0025	---
	Geosyntec	10/7/2016	COI-MW07-20161007-65-70	65 - 70	---	< 0.0025	< 0.0025	0.0037	< 0.0025	---
2018 Subsurface Investigation										
Issaquah Valley Elementary West Playfield Area of Interest										
IES-R01	Farallon	8/8/2018	IES-R01-180808	20.0	0.0091	0.025	0.036	0.11	0.012	0.0045
IES-R02	Farallon	8/10/2018	IES-R02-180810 (1140)	15.0	< 0.0093	0.02	0.041	0.13	0.02	0.0048
	Farallon	8/10/2018	IES-R02-180810 (1305)	25.0	0.031	0.068	0.15	0.36	0.054	0.012
IES-R03	Farallon	8/9/2018	IES-R03-180809 (0925)	13.5	< 0.0091	< 0.0045	0.0025 J	0.0022 J	< 0.0045	< 0.0045
	Farallon	8/9/2018	IES-R03-180809 (1110)	24.0	0.024	0.051	0.088	0.23	0.037	0.0053
IES-R04	Farallon	8/9/2018	IES-R04-180809	23.0	< 0.012	0.033	0.082	0.20	0.029	0.0097
Dodd Fields Park Area of Interest										
IES-R05	Farallon	8/10/2018	IES-R05-180810 (0825)	11.0	< 0.0091	0.01	0.0080	0.017	0.0028 J	0.0017
	Farallon	8/10/2018	IES-R05-180810 (0940)	28.0	0.013	0.039	0.053	0.20	0.029	0.011
Rainier Trail Area of Interest										
RT-R01	Farallon	8/17/2018	RT-01-180817-39	39.0	0.0033 J	0.0026 J	0.0046	0.0030 J	0.0024 J	< 0.0043
175 Newport Way Northwest Area of Interest										
NWN-R01	Farallon	8/24/2018	NWN_R01_180824_19	19.0	0.25	0.31	0.89	2.3	0.24	0.15
	Farallon	8/24/2018	NWN_R01_180824_19_DUPLICATE	19.0	0.23	0.31	0.84	1.8	0.24	0.18
NWN-R02	Farallon	8/23/2018	NMW-R02-180823-23	23.0	0.24	0.30	0.82	1.90	0.24	0.18
NWN-R03	Farallon	8/22/2018	NMW-R03-180822-28	28.0	0.010	0.018	0.044	0.180	0.024	0.0032 J
	Farallon	8/23/2018	NMW-R03-180823-39	39.0	0.0090 J	0.011	0.035	0.120	0.016	0.0025 J
Investigatory Screening Levels					**NE**	**NE**	**NE**	**NE**	**NE**	**NE**

NOTES:
< denotes analyte not detected at or exceeding the reporting limit listed.
— denotes sample not analyzed.
[1]Depth in feet below ground surface.
[2]Samples collected in 2016 analyzed by U.S. Environmental Protection Agency (EPA) Method 537; samples collected in 2018 analyzed by EPA Method 537 Modified.

Farallon = Farallon Consulting, L.L.C.
Geosyntec = Geosyntec Consultants, Inc.
J = result is an estimate
NE = not established
PFAS = per- and poly-fluoroalkyl substances

Table 7
Reconnaissance Groundwater Analytical Results for Long-Chain PFAS
PFAS Characterization Study
Issaquah, Washington
Farallon PN: 1754-002

Sample Location	Sampled By	Sample Date	Sample Identification	Sample Depth (feet)[1]	Analytical Results (micrograms per liter)[1]							
					Perfluorooctanoic Acid (PFOA)	Perfluorooctane Sulfonic Acid (PFOS)	Sum of PFOA and PFOS	Perfluorononanoic Acid (PFNA)	Perfluorodecanoic Acid (PFDA)	Perfluorodecane Sulfonic Acid (PFDS)	Perfluoroundecanoic Acid (PFUnDA)	Perfluorododecanoic Acid (PFDoDA)
Lower Issaquah Valley												
2016 Hydrogeological Characterization Investigation												
COI-MW01	Geosyntec	5/26/2016	MW01_30 TO 40_20160526	30 - 40	< 0.0025	< 0.0025	< 0.0050	< 0.0025	< 0.0025	---	< 0.0025	< 0.0025
	Geosyntec	5/26/2016	MW01_55 TO 65_20160526	55 - 65	< 0.0025	< 0.0025	< 0.0050	< 0.0025	< 0.0025	---	< 0.0025	< 0.0025
COI-MW02	Geosyntec	5/31/2016	MW02_40TO50_20160531	40 - 50	< 0.0025	< 0.0025	< 0.0050	< 0.0025	< 0.0025	---	< 0.0025	< 0.0025
COI-MW03	Geosyntec	5/24/2016	MW03_10 TO 20_20160524	10 - 20	0.0046	0.01	0.0146	0.0027	< 0.0025	---	< 0.0025	< 0.0025
	Geosyntec	5/24/2016	MW03_40 TO 50_20160524	40 - 50	0.0075	**0.11**	**0.1175**	0.0091	< 0.0025	---	< 0.0025	< 0.0025
COI-MW04	Geosyntec	5/27/2016	MW04_29 TO 39_20160527	29 - 39	< 0.0025	0.0028	0.0028	< 0.0025	< 0.0025	---	< 0.0025	< 0.0025
COI-MW05	Geosyntec	5/23/2016	MW05_10 TO 20_20160523	10 - 20	0.022	0.013	0.035	0.0084	< 0.0025	---	< 0.0025	< 0.0025
COI-MW06	Geosyntec	10/5/2016	COI-MW06-20161005-19.5-24.5	19.5 - 24.5	0.021	**0.30**	**0.321**	0.0069	< 0.0025	---	< 0.0025	< 0.0025
	Geosyntec	10/6/2016	COI-MW06-20161006-34.5-39.5	34.5 - 39.5	0.036	**0.50**	**0.536**	0.021	< 0.0025	---	0.0062	< 0.0025
	Geosyntec	10/6/2016	COI-MW06-20161006-51-56	51 - 56	0.04	**0.74**	**0.78**	0.022	< 0.0025	---	0.019	< 0.0025
COI-MW07	Geosyntec	10/7/2016	COI-MW07-20161007-20-25	20 - 25	0.029	0.025	0.054	< 0.0025	< 0.0025	---	< 0.0025	< 0.0025
	Geosyntec	10/7/2016	COI-MW07-20161007-35-40	35 - 40	< 0.0025	0.0042	0.0042	< 0.0025	< 0.0025	---	< 0.0025	< 0.0025
	Geosyntec	10/7/2016	COI-MW07-20161007-65-70	65 - 70	< 0.0025	0.018	0.018	< 0.0025	< 0.0025	---	< 0.0025	< 0.0025
2018 Subsurface Investigation												
Issaquah Valley Elementary West Playfield Area of Interest												
IES-R01	Farallon	8/8/2018	IES-R01-180808	20.0	0.012	**0.27**	**0.282**	0.011	< 0.0045	< 0.0045	< 0.0045	< 0.0045
IES-R02	Farallon	8/10/2018	IES-R02-180810 (1140)	15.0	0.023	**0.21**	**0.233**	0.0088	0.0013 J	< 0.0046	< 0.0046	< 0.0046
	Farallon	8/10/2018	IES-R02-180810 (1305)	25.0	0.045	**0.72**	**0.765**	0.026	0.0027 J	< 0.0048	0.0070	< 0.0048
IES-R03	Farallon	8/9/2018	IES-R03-180809 (0925)	13.5	0.0035	0.0031 J	0.0066	< 0.0045	< 0.0045	< 0.0045	0.00051 J	< 0.0045
	Farallon	8/9/2018	IES-R03-180809 (1110)	24.0	0.026	**0.38**	**0.406**	0.012	0.0021 J	< 0.0049	0.00033 J	< 0.0049
IES-R04	Farallon	8/9/2018	IES-R04-180809	23.0	0.03	**0.36**	**0.39**	0.034	0.0021 J	< 0.0061	0.017	< 0.0061
Dodd Fields Park Area of Interest												
IES-R05	Farallon	8/10/2018	IES-R05-180810 (0825)	11.0	0.0092	0.028	0.0372	0.0012 J	< 0.0045	< 0.0045	< 0.0045	< 0.0045
	Farallon	8/10/2018	IES-R05-180810 (0940)	28.0	0.026	**0.51**	**0.536**	0.04	0.0022 J	< 0.0045	0.02	< 0.0045
Rainier Trail Area of Interest												
RT-R01	Farallon	8/17/2018	RT-01-180817-39	39.0	0.0098	0.010	0.0198	0.0021 J	< 0.0043	< 0.0043	< 0.0043	< 0.0043
175 Newport Way Northwest Area of Interest												
NWN-R01	Farallon	8/24/2018	NWN_R01_180824_19	19.0	**0.39**	**7.3**	**7.69**	0.078	0.02	< 0.01	0.039	0.0015 J
	Farallon	8/24/2018	NWN_R01_180824_19_DUPLICATE	19.0	**0.39**	**6.8**	**7.19**	0.091	0.02	< 0.01	0.04	0.0011 J
NWN-R02	Farallon	8/23/2018	NMW-R02-180823-23	23.0	**0.45**	**9.50**	**9.95**	0.24	0.04	< 0.01	0.20	< 0.01
NWN-R03	Farallon	8/22/2018	NMW-R03-180822-28	28.0	0.032	**0.380**	**0.412**	0.015	0.0095	< 0.0043	0.013	< 0.0043
	Farallon	8/23/2018	NMW-R03-180823-39	39.0	0.021	**0.25**	**0.271**	0.015	0.011	< 0.0045	0.019	< 0.0045
Investigatory Screening Levels					**0.070**	**0.070**	**0.070**	**NE**	**NE**	**NE**	**NE**	**NE**

NOTES:

Results in **bold** denote concentrations exceeding applicable Washington State Department of Ecology Investigatory Levels.

< denotes analyte not detected at or exceeding the reporting limit listed.

— denotes sample not analyzed.

[1]Depth in feet below ground surface.

[2]Samples collected in 2016 analyzed by U.S. Environmental Protection Agency (EPA) Method 537; samples collected in 2018 analyzed by EPA Method 537 Modified.

Farallon = Farallon Consulting, L.L.C.
Geosyntec = Geosyntec Consultants, Inc.
J = result is an estimate
NE = not established
PFAS = per- and poly-fluoroalkyl substances

Table 8
Groundwater Analytical Results for Short-Chain PFAS
PFAS Characterization Study
Issaquah, Washington
Farallon PN: 1754-002

Sample Location	Sampled By	Sample Date	Sample Identification	Sample Depth (feet)[1]	Analytical Results (micrograms per liter)[1]					
					Perfluorobutanoic Acid (PFBA)	Perfluorobutane Sulfonic Acid (PFBS)	Perfluorohexanoic Acid (PFHxA)	Perfluorohexane Sulfonic Acid (PFHxS)	Perfluoroheptanoic Acid (PFHpA)	Perfluoroheptane Sulfonic Acid (PFHpS)
2016 Hydrogeological Characterization Investigation										
Lower Issaquah Valley										
COI-TW01	Geosyntec	5/17/2016	COI-MW1-051716	84-94	---	< 0.003	< 0.003	< 0.003	< 0.003	---
COI-TW03	Geosyntec	5/17/2016	COI-TW3-051716	Unknown	---	< 0.003	< 0.003	< 0.003	< 0.003	---
COI-MW01	Geosyntec	6/7/2016	COI-MW01-060716	28.0 - 38.0	---	< 0.0025	< 0.0025	< 0.0025	< 0.0025	---
	Geosyntec	10/17/2016	COI-MW01-20161017		---	< 0.0025	< 0.0025	< 0.0025	< 0.0025	---
COI-MW02	Geosyntec	6/7/2016	COI-MW02-060716	70.0 - 90.0	---	< 0.0025	< 0.0025	< 0.0025	< 0.0025	---
	Geosyntec	10/17/2016	COI-MW02-2016017		---	0.008	< 0.0025	0.005	< 0.0025	---
	Farallon	10/25/2018	C01-MW02-181025	80.0	< 0.0083	0.0049	< 0.0042	0.0026 J	< 0.0042	< 0.0042
COI-MW03	Geosyntec	6/7/2016	COI-MW03-060716	78.0 - 98.0	---	0.092	0.065	0.28	0.029	---
	Geosyntec	6/7/2016	COI-MW03-060716-DUP		---	0.094	0.067	0.30	0.029	---
	Geosyntec	6/21/2016	COI-MW03-20160621		---	0.062	0.033	0.17	0.014	---
	Geosyntec	6/21/2016	COI-MW03-20160621-DUP		---	0.059	0.033	0.17	0.015	---
	Geosyntec	6/28/2016	COI-MW03-20160628		---	0.049	0.031	0.11	0.014	---
	Geosyntec	6/28/2016	COI-MW03-20160628-DUP		---	0.047	0.026	0.097	0.011	---
	Geosyntec	7/6/2016	COI-MW03-20160716		---	0.025	0.015	0.062	0.0063	---
	Geosyntec	7/6/2016	COI-MW03-20160716-DUP		---	0.026	0.014	0.062	0.0062	---
	Geosyntec	7/13/2016	COI-MW03-20160713		---	0.031	0.016	0.075	0.0071	---
	Geosyntec	7/13/2016	COI-MW03-20160713 DUP		---	0.029	0.014	0.070	0.0064	---
	Geosyntec	7/20/2016	COI-MW03-20160720		---	0.032	0.017	0.080	0.0071	---
	Geosyntec	7/20/2016	COI-MW03-20160720-DUP		---	0.033	0.017	0.074	0.0073	---
	Geosyntec	7/28/2016	COI-MW03-20160728		---	0.071	0.039	0.17	0.017	---
	Geosyntec	7/28/2016	COI-MW03-20160728-DUP		---	0.072	0.035	0.16	0.015	---
	Geosyntec	10/17/2016	COI-MW03-2016017		---	0.032	0.018	0.067	0.0071	---
	Geosyntec	10/17/2016	COI-MW03-20161017-DUP		---	0.033	0.018	0.070	0.0069	---
	Farallon	10/24/2018	C01-MW03-181024	88.0	0.0087	0.039	0.025	0.048	0.0083	0.0017 J
COI-MW04	Geosyntec	6/7/2016	COI-MW04-060716	70.0 - 90.0	---	< 0.0025	< 0.0025	< 0.0025	< 0.0025	---
	Geosyntec	6/21/2016	COI-MW04-20160621		---	< 0.0025	< 0.0025	< 0.0025	< 0.0025	---
	Geosyntec	6/28/2016	COI-MW04-20160628		---	< 0.0025	< 0.0025	< 0.0025	< 0.0025	---
	Geosyntec	7/6/2016	COI-MW04-20160716		---	< 0.0025	< 0.0025	< 0.0025	< 0.0025	---
	Geosyntec	7/13/2016	COI-MW04-20160713		---	< 0.0025	< 0.0025	< 0.0025	< 0.0025	---
	Geosyntec	7/20/2016	COI-MW04-20160720		---	< 0.0025	< 0.0025	< 0.0025	< 0.0025	---
	Geosyntec	7/27/2016	COI-MW04-20160727		---	< 0.0025	< 0.0025	< 0.0025	< 0.0025	---
	Geosyntec	10/17/2016	COI-MW04-20161017		---	< 0.0025	< 0.0025	< 0.0025	< 0.0025	---
	Farallon	10/24/2018	C01-MW04-101024	80.0	< 0.0083	0.0017 J	< 0.0042	0.0034 J	< 0.0042	< 0.0042
Investigatory Screening Levels					**NE**	**NE**	**NE**	**NE**	**NE**	**NE**

Table 8
Groundwater Analytical Results for Short-Chain PFAS
PFAS Characterization Study
Issaquah, Washington
Farallon PN: 1754-002

Sample Location	Sampled By	Sample Date	Sample Identification	Sample Depth (feet)[1]	Analytical Results (micrograms per liter)[1] Perfluorobutanoic Acid (PFBA)	Perfluorobutane Sulfonic Acid (PFBS)	Perfluorohexanoic Acid (PFHxA)	Perfluorohexane Sulfonic Acid (PFHxS)	Perfluoroheptanoic Acid (PFHpA)	Perfluoroheptane Sulfonic Acid (PFHpS)
COI-MW05	Geosyntec	6/7/2016	COI-MW05-060716	70.0 - 90.0	---	0.057	0.04	0.16	0.018	---
	Geosyntec	6/21/2016	COI-MW05-20160621		---	0.054	0.042	0.17	0.019	---
	Geosyntec	6/28/2016	COI-MW05-20160628		---	0.07	0.056	0.18	0.027	---
	Geosyntec	7/6/2016	COI-MW05-20160716		---	0.056	0.039	0.17	0.017	---
	Geosyntec	7/13/2016	COI-MW05-20160713		---	0.058	0.054	0.21	0.025	---
	Geosyntec	7/20/2016	COI-MW05-20160720		---	0.052	0.04	0.18	0.019	---
	Geosyntec	7/28/2016	COI-MW05-20160728		---	0.066	0.049	0.18	0.023	---
	Geosyntec	10/17/2016	COI-MW05-20161017		---	0.061	0.048	0.17	0.021	---
	Farallon	10/25/2018	C01-MW05-181025	80.0	0.022	0.050	0.080	0.14	0.030	0.0044
COI-MW06	Geosyntec	10/17/2016	COI-MW06-20161017	80.0 - 100.0	---	0.096	0.22	0.49	0.073	---
	Farallon	10/25/2018	C01-MW06-181025	90.0	0.15	0.23	0.60	1.1	0.17	0.068
COI-MW07	Geosyntec	10/17/2016	COI-MW07-20161017	100.0 - 110.0	---	< 0.0025	< 0.0025	0.0049	< 0.0025	---
	Farallon	10/25/2018	C01-MW07-181025	105.0	< 0.0083	0.00097 J	0.0011 J	0.0031 J	< 0.0042	< 0.0042
COI-PW04	Farallon	7/22/2013	WELL #4-1	89.5	---	---	---	0.241	0.0258	---
	Farallon	7/9/2018	WELL 4 RAW WATER-27	89.5	---	< 0.09	---	0.113	0.0104	---
	Farallon	10/29/2018	Well #4	89.5	---	0.035	---	0.037	0.012	---
COI-PW05	Geosyntec	7/6/2016	COI-WELL 5-20160716	323-405	---	0.0064	0.006	0.022	< 0.0025	---
	Geosyntec	7/13/2016	COI-WELL5-20160713		---	0.0081	0.0072	0.026	0.0031	---
	Geosyntec	7/27/2016	COI-WELL5-20160727		---	0.0041	0.003	0.014	< 0.0025	---
COI-PW05-OBS	Geosyntec	7/6/2016	COI-WELL 50BS-20160716	330 - 450	---	< 0.0025	< 0.0025	< 0.0025	< 0.0025	---
DG-PW01	Geosyntec	5/4/2016	DARIGOLD-ABY249-050416	81-96	---	0.0032	< 0.0025	0.0088	< 0.0025	---
	Geosyntec	5/4/2016	DARIGOLD-ABY249-050416-DUP		---	0.0032	< 0.0025	0.0085	< 0.0025	---
2018 Subsurface Investigation										
Issaquah Valley Elementary West Playfield Area of Interest										
IES-MW01	Farallon	10/26/2018	1ES-MW05-181026	21.0	0.0072 J	0.019	0.018	0.062	0.0079	0.0037 J
IES-MW02	Farallon	10/26/2018	1ES-MW03-181026	20.0	0.021	0.050	0.062	0.190	0.027	0.0043
IES-MW03	Farallon	10/26/2018	1ES-MW01-181026	20.0	0.0056 J	0.015	0.016	0.065	0.0071	0.0014 J
IES-MW04	Farallon	10/26/2018	1ES-MW02-181026	20.0	0.029	0.055	0.100	0.26	0.036	0.010
Investigatory Screening Levels					**NE**	**NE**	**NE**	**NE**	**NE**	**NE**

Table 8
Groundwater Analytical Results for Short-Chain PFAS
PFAS Characterization Study
Issaquah, Washington
Farallon PN: 1754-002

Sample Location	Sampled By	Sample Date	Sample Identification	Sample Depth (feet)[1]	Analytical Results (micrograms per liter)[1]					
					Perfluorobutanoic Acid (PFBA)	Perfluorobutane Sulfonic Acid (PFBS)	Perfluorohexanoic Acid (PFHxA)	Perfluorohexane Sulfonic Acid (PFHxS)	Perfluoroheptanoic Acid (PFHpA)	Perfluoroheptane Sulfonic Acid (PFHpS)
Dodd Fields Park Area of Interest										
IES-MW05	Farallon	10/26/2018	1ES-MW04-181026	25.0	0.012	0.022	0.034	0.12	0.016	0.0070
DF-MW02	Farallon	8/3/2018	DF-MW02-180803	17.0	0.0044 J	0.022	0.012	0.23	0.0040 J	0.0077
	Farallon	8/3/2018	QA/QC-01-180803		0.0042 J	0.020	0.011	0.20	0.0033 J	0.0058
DF-MW03	Farallon	8/3/2018	DF-MW03-180803	18.0	0.0048 J	0.0079	0.012	0.033	0.0062	0.0028 J
Memorial Field Area of Interest										
MF-MW01	Farallon	10/26/2018	MF-MW01-181026	39.0	< 0.0081	0.0031 J	< 0.0040	0.0052	< 0.0040	< 0.0040
MF-MW02	Farallon	10/26/2018	MF-MW02-181026	36.0	< 0.0082	0.0091	0.0031 J	0.032	< 0.0041	0.00090 J
MF-MW03	Farallon	10/25/2018	MF-MW03-181025	43.0	< 0.0083	< 0.0042	0.0012 J	0.0015 J	< 0.0042	< 0.0042
Rainier Trail Area of Interest										
RT-MW01	Farallon	8/3/2018	RT-MW01-180803	40.0	0.0076 J	0.013	0.014	0.032	0.0091	0.00098 J
RT-MW03	Farallon	8/3/2018	RT-MW03-180803	40.0	< 0.0082	0.0082	0.0059	0.029	0.0026 J	< 0.0041
RT-MW04	Farallon	10/26/2018	RT-MW04-181026	35.0	0.0035 J	0.0024 J	0.0061	0.0026 J	0.0034 J	< 0.0042
175 Newport Way Northwest Area of Interest										
NWN-MW01	Farallon	10/26/2018	NWN-MW01-181026	24.0	0.0078 J	0.0072	0.023	0.013	0.0069	< 0.0042
NWN-MW02	Farallon	10/26/2018	NWN-MW02-181026	26.0	0.0066 J	0.012	0.0097	0.14	0.0061	0.0021 J
NWN-MW03	Farallon	10/26/2018	NWN-MW03-181026	26.0	0.17	0.061	0.55	0.26	0.17	0.013
NWN-MW04	Farallon	10/26/2018	NWN-MW04-181026	13.0 - 23.0	0.17	0.14	0.67	0.61	0.16	0.043
	Farallon	10/26/2018	NWN-MW04-181026-DUP		0.17	0.13	0.67	0.65	0.17	0.038
Investigatory Screening Levels					**NE**	**NE**	**NE**	**NE**	**NE**	**NE**

NOTES:

< denotes analyte not detected at or exceeding the reporting limit listed.

— denotes sample not analyzed.

[1]Depth in feet below ground surface.

[2]Samples collected in 2016 analyzed by U.S. Environmental Protection Agency (EPA) Method 537; samples collected in 2018 analyzed by EPA Method 537 Modified.

Farallon = Farallon Consulting, L.L.C.

Geosyntec = Geosyntec Consultants, Inc.

J = result is an estimate

NE = not established

PFAS = per- and poly-fluoroalkyl substances

Table 9
Groundwater Analytical Results for Long-Chain PFAS
PFAS Characterization Study
Issaquah, Washington
Farallon PN: 1754-002

Sample Location	Sampled By	Sample Date	Sample Identification	Sample Depth (feet)[1]	Analytical Results (micrograms per liter)[1] Perfluorooctanoic Acid (PFOA)	Perfluorooctane Sulfonic Acid (PFOS)	Sum of PFOA and PFOS	Perfluorononanoic Acid (PFNA)	Perfluorodecanoic Acid (PFDA)	Perfluorodecane Sulfonic Acid (PFDS)	Perfluoroundecanoic Acid (PFUnDA)	Perfluorododecanoic Acid (PFDoDA)
2016 Hydrogeological Characterization Investigation												
Lower Issaquah Valley												
COI-TW01	Geosyntec	5/17/2016	COI-MW1-051716	84-94	< 0.003	0.0034	0.0034	< 0.003	< 0.003	---	< 0.003	< 0.003
COI-TW03	Geosyntec	5/17/2016	COI-TW3-051716	Unknown	< 0.003	< 0.003	< 0.006	< 0.003	< 0.003	---	< 0.003	< 0.003
COI-MW01	Geosyntec	6/7/2016	COI-MW01-060716	28.0 - 38.0	0.0068	< 0.0025	0.0068	< 0.0025	< 0.0025	---	< 0.0025	< 0.0025
	Geosyntec	10/17/2016	COI-MW01-20161017		< 0.0025	< 0.0025	< 0.0050	< 0.0025	< 0.0025	---	< 0.0025	< 0.0025
COI-MW02	Geosyntec	6/7/2016	COI-MW02-060716	70.0 - 90.0	< 0.0025	< 0.0025	< 0.0050	< 0.0025	< 0.0025	---	< 0.0025	< 0.0025
	Geosyntec	10/17/2016	COI-MW02-2016017		< 0.0025	< 0.0025	< 0.0050	< 0.0025	< 0.0025	---	< 0.0025	< 0.0025
	Farallon	10/25/2018	C01-MW02-181025	80.0	< 0.0017	< 0.0042	< 0.0059	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0042
COI-MW03	Geosyntec	6/7/2016	COI-MW03-060716	78.0 - 98.0	0.029	**0.44**	**0.47**	0.051	< 0.0025	---	< 0.0025	< 0.0025
	Geosyntec	6/7/2016	COI-MW03-060716-DUP		0.030	**0.46**	**0.49**	0.051	< 0.0025	---	< 0.0025	< 0.0025
	Geosyntec	6/21/2016	COI-MW03-20160621		0.020	**0.26**	**0.28**	0.016	< 0.0025	---	< 0.0025	< 0.0025
	Geosyntec	6/21/2016	COI-MW03-20160621-DUP		0.019	**0.26**	**0.28**	0.018	< 0.0025	---	< 0.0025	< 0.0025
	Geosyntec	6/28/2016	COI-MW03-20160628		0.012	**0.17**	**0.18**	0.016	< 0.0025	---	< 0.0025	< 0.0025
	Geosyntec	6/28/2016	COI-MW03-20160628-DUP		0.012	**0.15**	**0.16**	0.013	< 0.0025	---	< 0.0025	< 0.0025
	Geosyntec	7/6/2016	COI-MW03-20160716		0.0051 J	**0.100**	**0.11**	0.0061	< 0.0025	---	< 0.0025	< 0.0025
	Geosyntec	7/6/2016	COI-MW03-20160716-DUP		0.0071 J	**0.100**	**0.11**	0.0056	< 0.0025	---	< 0.0025	< 0.0025
	Geosyntec	7/13/2016	COI-MW03-20160713		0.006	**0.088**	**0.09**	0.0063	< 0.0025	---	< 0.0025	< 0.0025
	Geosyntec	7/13/2016	COI-MW03-20160713 DUP		0.0053	**0.100**	**0.11**	0.0055	< 0.0025	---	< 0.0025	< 0.0025
	Geosyntec	7/20/2016	COI-MW03-20160720		0.0062	**0.098**	**0.10**	0.0063	< 0.0025	---	< 0.0025	< 0.0025
	Geosyntec	7/20/2016	COI-MW03-20160720-DUP		0.0063	**0.100**	**0.11**	0.0071	< 0.0025	---	< 0.0025	< 0.0025
	Geosyntec	7/28/2016	COI-MW03-20160728		0.016	**0.360**	**0.38**	0.025	< 0.0025	---	< 0.0025	< 0.0025
	Geosyntec	7/28/2016	COI-MW03-20160728-DUP		0.015	**0.330**	**0.35**	0.022	< 0.0025	---	< 0.0025	< 0.0025
	Geosyntec	10/17/2016	COI-MW03-2016017		0.0059	**0.088**	**0.094**	0.0055	< 0.0025	---	< 0.0025	< 0.0025
	Geosyntec	10/17/2016	COI-MW03-20161017-DUP		0.0061	**0.099**	**0.11**	0.0056	< 0.0025	---	< 0.0025	< 0.0025
	Farallon	10/24/2018	C01-MW03-181024	88.0	0.0071	0.053	0.0601	0.0048	< 0.0042	< 0.0042	< 0.0042	< 0.0042
COI-MW04	Geosyntec	6/7/2016	COI-MW04-060716	70.0 - 90.0	< 0.0025	0.003	0.003	< 0.0025	< 0.0025	---	< 0.0025	< 0.0025
	Geosyntec	6/21/2016	COI-MW04-20160621		< 0.0025	< 0.0025	< 0.0050	< 0.0025	< 0.0025	---	< 0.0025	< 0.0025
	Geosyntec	6/28/2016	COI-MW04-20160628		< 0.0025	< 0.0025	< 0.0050	< 0.0025	< 0.0025	---	< 0.0025	< 0.0025
	Geosyntec	7/6/2016	COI-MW04-20160716		< 0.0025	< 0.0025	< 0.0050	< 0.0025	< 0.0025	---	< 0.0025	< 0.0025
	Geosyntec	7/13/2016	COI-MW04-20160713		< 0.0025	< 0.0025	< 0.0050	< 0.0025	< 0.0025	---	< 0.0025	< 0.0025
	Geosyntec	7/20/2016	COI-MW04-20160720		< 0.0025	< 0.0025	< 0.0050	< 0.0025	< 0.0025	---	< 0.0025	< 0.0025
	Geosyntec	7/27/2016	COI-MW04-20160727		0.0039	< 0.0025	0.0039	< 0.0025	< 0.0025	---	< 0.0025	< 0.0025
	Geosyntec	10/17/2016	COI-MW04-20161017		< 0.0025	0.0025	0.0025	< 0.0025	< 0.0025	---	< 0.0025	< 0.0025
	Farallon	10/24/2018	C01-MW04-101024	80.0	< 0.0017	0.0023 J	0.0023	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0042
COI-MW05	Geosyntec	6/7/2016	COI-MW05-060716	70.0 - 90.0	0.017	**0.39**	**0.41**	0.0086	< 0.0025	---	< 0.0025	< 0.0025
	Geosyntec	6/21/2016	COI-MW05-20160621		0.013	**0.49**	**0.50**	0.008	< 0.0025	---	< 0.0025	< 0.0025
	Geosyntec	6/28/2016	COI-MW05-20160628		0.017	**0.50**	**0.52**	0.01	< 0.0025	---	< 0.0025	< 0.0025
	Geosyntec	7/6/2016	COI-MW05-20160716		0.011	**0.48**	**0.49**	0.0075	< 0.0025	---	< 0.0025	< 0.0025
	Geosyntec	7/13/2016	COI-MW05-20160713		0.018	**0.44**	**0.46**	0.012	< 0.0025	---	< 0.0025	< 0.0025
	Geosyntec	7/20/2016	COI-MW05-20160720		0.013	**0.51**	**0.52**	0.0093	< 0.0025	---	< 0.0025	< 0.0025
	Geosyntec	7/28/2016	COI-MW05-20160728		0.018	**0.51**	**0.53**	0.0087	< 0.0025	---	< 0.0025	< 0.0025
	Geosyntec	10/17/2016	COI-MW05-20161017		0.015	**0.40**	**0.42**	0.0079	< 0.0025	---	< 0.0025	< 0.0025
	Farallon	10/25/2018	C01-MW05-181025	80.0	0.019	**0.29**	**0.31**	0.011	0.00073 J	< 0.0042	< 0.0042	< 0.0042
COI-MW06	Geosyntec	10/17/2016	COI-MW06-20161017	80.0 - 100.0	**0.08**	**2.2**	**2.3**	0.053	0.0029	---	0.016	< 0.0025
	Farallon	10/25/2018	C01-MW06-181025	90.0	**0.25**	**3.3**	**3.6**	0.15	0.0065	< 0.0042	0.035	< 0.0042
Investigatory Screening Levels					**0.070**	**0.070**	**0.070**	**NE**	**NE**	**NE**	**NE**	**NE**

Table 9
Groundwater Analytical Results for Long-Chain PFAS
PFAS Characterization Study
Issaquah, Washington
Farallon PN: 1754-002

Sample Location	Sampled By	Sample Date	Sample Identification	Sample Depth (feet)[1]	Analytical Results (micrograms per liter)[1]							
					Perfluorooctanoic Acid (PFOA)	Perfluorooctane Sulfonic Acid (PFOS)	Sum of PFOA and PFOS	Perfluorononanoic Acid (PFNA)	Perfluorodecanoic Acid (PFDA)	Perfluorodecane Sulfonic Acid (PFDS)	Perfluoroundecanoic Acid (PFUnDA)	Perfluorododecanoic Acid (PFDoDA)
COI-MW07	Geosyntec	10/17/2016	COI-MW07-20161017	100.0 - 110.0	0.003	0.0049	0.0079	< 0.0025	< 0.0025	---	< 0.0025	< 0.0025
	Farallon	10/25/2018	C01-MW07-181025	105.0	0.0022	0.0033 J	0.0055	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0042
COI-PW04	Farallon	7/22/2013	WELL #4-1	89.5	0.0215	**0.6**	**0.6215**	0.028	---	---	---	---
	Farallon	7/9/2018	WELL 4 RAW WATER-27	89.5	0.0120 J	**0.320**	**0.332**	0.0137 J	---	---	---	---
	Farallon	10/29/2018	Well #4	89.5	0.013	**0.300**	**0.313**	0.017	---	---	---	---
COI-PW05	Geosyntec	7/6/2016	COI-WELL 5-20160716	323-405	0.0028	0.032	0.0348	0.0035	< 0.0025	---	< 0.0025	< 0.0025
	Geosyntec	7/13/2016	COI-WELL5-20160713		0.0031	0.032	0.0351	0.0043	< 0.0025	---	< 0.0025	< 0.0025
	Geosyntec	7/27/2016	COI-WELL5-20160727		0.0037	0.019	0.0227	< 0.0025	< 0.0025	---	< 0.0025	< 0.0025
COI-PW05-OBS	Geosyntec	7/6/2016	COI-WELL 50BS-20160716	330 - 450	< 0.0025	< 0.0025	< 0.0050	< 0.0025	< 0.0025	---	< 0.0025	< 0.0025
DG-PW01	Geosyntec	5/4/2016	DARIGOLD-ABY249-050416	81-96	< 0.0025	0.0064	0.0064	< 0.0025	< 0.0025	---	< 0.0025	< 0.0025
	Geosyntec	5/4/2016	DARIGOLD-ABY249-050416-DUP		< 0.0025	0.007	0.007	< 0.0025	< 0.0025	---	< 0.0025	< 0.0025
2018 Subsurface Investigation												
Issaquah Valley Elementary West Playfield Area of Interest												
IES-MW01	Farallon	10/26/2018	IES-MW05-181026	21.0	0.0097	**0.19**	**0.20**	0.0077	< 0.0041	< 0.0041	< 0.0041	< 0.0041
IES-MW02	Farallon	10/26/2018	IES-MW03-181026	20.0	0.019	**0.24**	**0.26**	0.0065	0.00065 J	< 0.0042	< 0.0042	< 0.0042
IES-MW03	Farallon	10/26/2018	IES-MW01-181026	20.0	0.0056	**0.076**	**0.082**	0.0014 J	< 0.0042	< 0.0042	< 0.0042	< 0.0042
IES-MW04	Farallon	10/26/2018	IES-MW02-181026	20.0	0.037	**0.53**	**0.57**	0.022	0.0012 J	< 0.0042	0.0023 J	< 0.0042
Dodd Fields Park Area of Interest												
IES-MW05	Farallon	10/26/2018	IES-MW04-181026	25.0	0.019	**0.38**	**0.40**	0.033	0.0012 J	< 0.0042	0.0098	< 0.0042
DF-MW02	Farallon	8/3/2018	DF-MW02-180803	17.0	0.010	**0.55**	**0.56**	0.025	0.0020 J	< 0.0041	0.0068	< 0.0041
	Farallon	8/3/2018	QA/QC-01-180803		0.0093	**0.52**	**0.53**	0.025	0.0016 J	< 0.0041	0.0059	< 0.0041
DF-MW03	Farallon	8/3/2018	DF-MW03-180803	18.0	0.0062	**0.13**	**0.14**	0.0092	0.00073 J	< 0.0041	0.0016 J	< 0.0041
Memorial Field Area of Interest												
MF-MW01	Farallon	10/26/2018	MF-MW01-181026	39.0	0.0012 J	0.0058	0.0070	0.0036 J	< 0.0040	< 0.0040	0.0023 J	< 0.0040
MF-MW02	Farallon	10/26/2018	MF-MW02-181026	36.0	0.0035	0.054	0.0575	0.026	0.00059 J	< 0.0041	0.0061	< 0.0041
MF-MW03	Farallon	10/25/2018	MF-MW03-181025	43.0	0.0022	0.0039 J	0.0061	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0042
Rainier Trail Area of Interest												
RT-MW01	Farallon	8/3/2018	RT-MW01-180803	40.0	0.015	0.053	0.068	0.0045	0.0065	< 0.0044	0.00040 J	< 0.0044
RT-MW03	Farallon	8/3/2018	RT-MW03-180803	40.0	0.0081	0.045	0.0531	0.0015 J	< 0.0041	< 0.0041	0.0083	< 0.0041
RT-MW04	Farallon	10/26/2018	RT-MW04-181026	35.0	0.013	0.0080	0.021	0.0019 J	< 0.0042	< 0.0042	< 0.0042	< 0.0042
175 Newport Way Northwest Area of Interest												
NWN-MW01	Farallon	10/26/2018	NWN-MW01-181026	24.0	0.012 J	0.052	0.064	0.0030 J	0.00094 J	< 0.0042	< 0.0042	< 0.0042
NWN-MW02	Farallon	10/26/2018	NWN-MW02-181026	26.0	0.0091	**0.086**	**0.095**	0.0043	0.0029 J	< 0.0042	0.0027 J	< 0.0042
NWN-MW03	Farallon	10/26/2018	NWN-MW03-181026	26.0	**0.16**	**1.0**	**1.2**	0.13	0.0081	< 0.0042	0.057	< 0.0042
NWN-MW04	Farallon	10/26/2018	NWN-MW04-181026	13.0 - 23.0	**0.20**	**2.2**	**2.4**	0.057	0.017	< 0.0042	0.062	< 0.0042
NWN-MW04	Farallon	10/26/2018	NWN-MW04-181026-DUP		**0.21**	**2.4**	**2.6**	0.057	0.016	< 0.0042	0.061	< 0.0042
Investigatory Screening Levels					**0.070**	**0.070**	**0.070**	**NE**	**NE**	**NE**	**NE**	**NE**

NOTES:

Results in **bold** denote concentrations exceeding applicable Washington State Department of Ecology Investigatory Levels.

< denotes analyte not detected at or exceeding the reporting limit listed.

— denotes sample not analyzed.

[1]Depth in feet below ground surface.

[2]Samples collected in 2016 analyzed by U.S. Environmental Protection Agency (EPA) Method 537; samples collected in 2018 analyzed by EPA Method 537 Modified.

Farallon = Farallon Consulting, L.L.C.

Geosyntec = Geosyntec Consultants, Inc.

J = result is an estimate

NE = not established

PFAS = per- and poly-fluoroalkyl substances

Table 10
Field QC Sample Analytical Results for Short-Chain PFAS
PFAS Characterization Study
Issaquah, Washington
Farallon PN: 1754-002

Sample Type	Sampled By	Sample Date	Sample Identification	Analytical Results (micrograms per liter)[1] Perfluorobutanoic Acid (PFBA)	Perfluorobutane Sulfonic Acid (PFBS)	Perfluorohexanoic Acid (PFHxA)	Perfluorohexane Sulfonic Acid (PFHxS)	Perfluoroheptanoic Acid (PFHpA)	Perfluoroheptane Sulfonic Acid (PFHpS)
Field Blank Samples									
Field Blank	Farallon	8/15/2018	FIELD_BLANK_180815	< 0.0086	< 0.0043	< 0.0043	< 0.0043	< 0.0043	< 0.0043
Rinsate Blank Samples									
Rinsate Blank	Farallon	8/6/2018	RINSATE_BLANK_180806	< 0.0085	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0042
Rinsate Blank	Farallon	8/8/2018	RINSATE_BLANK_180808	< 0.0082	< 0.0041	< 0.0041	< 0.0041	< 0.0041	< 0.0041
Rinsate Blank	Farallon	8/15/2018	RINSATE_BLANK_180815	< 0.0082	< 0.0041	< 0.0041	< 0.0041	< 0.0041	< 0.0041
Rinsate Blank	Farallon	8/23/2018	RINSATE-BLANK-BAGS-180823	< 0.0085	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0042
Rinsate Blank	Farallon	8/23/2018	RINSATE-BLANK-GLOVES-180823	< 0.0085	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0042
Rinsate Blank	Farallon	8/23/2018	RINSATE-BLANK-TUBING-180823	< 0.0085	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0042
Rinsate Blank	Farallon	8/24/2018	RINSATE_BLANK_CORE_BARREL_180824	< 0.0091	< 0.0045	< 0.0045	< 0.0045	< 0.0045	< 0.0045
Trip Blank Samples									
Trip Blank	Farallon	8/3/2018	TRIP_BLANK_180803	< 0.0083	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0042
Trip Blank	Farallon	8/6/2018	TRIP_BLANK_180806	< 0.017	< 0.0083	< 0.0083	< 0.0083	< 0.0083	< 0.0083
Trip Blank	Farallon	8/7/2018	TRIP BLANK-180807	< 0.016	< 0.0081	0.0016 J	< 0.0081	< 0.0081	< 0.0081
Trip Blank	Farallon	8/8/2018	TRIP_BLANK_180808	< 0.017	< 0.0083	< 0.0083	< 0.0083	< 0.0083	< 0.0083
Trip Blank	Farallon	8/9/2018	TRIP_BLANK_180809	< 0.016	< 0.0081	0.0022 J	< 0.0081	< 0.0081	< 0.0081
Trip Blank	Farallon	8/10/2018	TRIP_BLANK_180810	< 0.0088	< 0.0044	< 0.0044	< 0.0044	< 0.0044	< 0.0044
Trip Blank	Farallon	8/13/2018	TRIP-BLANK-180813	< 0.0086	< 0.0043	< 0.0043	< 0.0043	< 0.0043	< 0.0043
Trip Blank	Farallon	8/14/2018	TRIP-BLANK-180814	< 0.0083	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0042
Trip Blank	Farallon	8/15/2018	TRIP_BLANK_180815	< 0.0082	< 0.0041	< 0.0041	< 0.0041	< 0.0041	< 0.0041
Trip Blank	Farallon	8/16/2018	TRIP_BLANK_180816	< 0.0085	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0042
Trip Blank	Farallon	8/21/2018	TRIP BLANK-180821	< 0.0083	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0042
Trip Blank	Farallon	8/24/2018	TRIP_BLANK_180824	< 0.0086	< 0.0043	< 0.0043	< 0.0043	< 0.0043	< 0.0043
Trip Blank	Farallon	10/24/2018	TRIP-BLANK-181024	< 0.0083	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0042
Investigatory Screening Levels				**NE**	**NE**	**NE**	**NE**	**NE**	**NE**

NOTES:
< denotes analyte not detected at or exceeding the reporting limit listed.
[1]Analyzed by U.S. Environmental Protection Agency Method 537 Modified.

Farallon = Farallon Consulting, L.L.C.
J = result is an estimate
NE = not established
PFAS = per- and poly-fluoroalkyl substances
QC = quality control

Table 11
Field QC Sample Analytical Results for Long-Chain PFAS
PFAS Characterization Study
Issaquah, Washington
Farallon PN: 1754-002

Sample Type	Sampled By	Sample Date	Sample Identification	Analytical Results (micrograms per liter)[1]						
				Perfluorooctanoic Acid (PFOA)	Perfluorooctane Sulfonic Acid (PFOS)	Perfluorononanoic Acid (PFNA)	Perfluorodecanoic Acid (PFDA)	Perfluorodecane Sulfonic Acid (PFDS)	Perfluoroundecanoic Acid (PFUnDA)	Perfluorododecanoic Acid (PFDoDA)
Field Blank Samples										
Field Blank	Farallon	8/15/2018	FIELD_BLANK_180815	< 0.0017	< 0.0043	< 0.0043	< 0.0043	< 0.0043	< 0.0043	< 0.0043
Rinsate Blank Samples										
Rinsate Blank	Farallon	8/6/2018	RINSATE_BLANK_180806	< 0.0017	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0042
Rinsate Blank	Farallon	8/8/2018	RINSATE_BLANK_180808	< 0.0016	< 0.0041	< 0.0041	< 0.0041	< 0.0041	0.00035 J	< 0.0041
Rinsate Blank	Farallon	8/15/2018	RINSATE_BLANK_180815	< 0.0016	< 0.0041	< 0.0041	< 0.0041	< 0.0041	< 0.0041	< 0.0041
Rinsate Blank	Farallon	8/23/2018	RINSATE-BLANK-BAGS-180823	< 0.0017	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0042
Rinsate Blank	Farallon	8/23/2018	RINSATE-BLANK-GLOVES-180823	< 0.0017	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0042
Rinsate Blank	Farallon	8/23/2018	RINSATE-BLANK-TUBING-180823	< 0.0017	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0042
Rinsate Blank	Farallon	8/24/2018	RINSATE_BLANK_CORE_BARREL_180824	< 0.0018	< 0.0045	< 0.0045	< 0.0045	< 0.0045	< 0.0045	< 0.0045
Trip Blank Samples										
Trip Blank	Farallon	8/3/2018	TRIP_BLANK_180803	< 0.0017	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0042
Trip Blank	Farallon	8/6/2018	TRIP_BLANK_180806	< 0.0033	< 0.0083	< 0.0083	< 0.0083	< 0.0083	< 0.0083	< 0.0083
Trip Blank	Farallon	8/7/2018	TRIP BLANK-180807	< 0.0032	< 0.0081	< 0.0081	< 0.0081	< 0.0081	< 0.0081	< 0.0081
Trip Blank	Farallon	8/8/2018	TRIP_BLANK_180808	< 0.0033	< 0.0083	< 0.0083	< 0.0083	< 0.0083	< 0.0083	< 0.0083
Trip Blank	Farallon	8/9/2018	TRIP_BLANK_180809	0.00085 J	< 0.0081	< 0.0081	< 0.0081	< 0.0081	0.00054 J	< 0.0081
Trip Blank	Farallon	8/10/2018	TRIP_BLANK_180810	< 0.0018	< 0.0044	< 0.0044	< 0.0044	< 0.0044	< 0.0044	< 0.0044
Trip Blank	Farallon	8/13/2018	TRIP-BLANK-180813	< 0.0017	< 0.0043	< 0.0043	< 0.0043	< 0.0043	< 0.0043	< 0.0043
Trip Blank	Farallon	8/14/2018	TRIP-BLANK-180814	< 0.0017	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0042
Trip Blank	Farallon	8/15/2018	TRIP_BLANK_180815	< 0.0016	< 0.0041	< 0.0041	< 0.0041	< 0.0041	< 0.0041	< 0.0041
Trip Blank	Farallon	8/16/2018	TRIP_BLANK_180816	< 0.0017	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0042
Trip Blank	Farallon	8/21/2018	TRIP BLANK-180821	< 0.0017	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0042
Trip Blank	Farallon	8/24/2018	TRIP_BLANK_180824	< 0.0017	< 0.0043	< 0.0043	< 0.0043	< 0.0043	< 0.0043	< 0.0043
Trip Blank	Farallon	10/24/2018	TRIP-BLANK-181024	< 0.0017	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0042	< 0.0042
Investigatory Screening Levels				**0.070**	**0.070**	**NE**	**NE**	**NE**	**NE**	**NE**

NOTES:

< denotes analyte not detected at or above the reporting limit listed.

[1]Analyzed by U.S. Environmental Protection Agency Method 537 Modified.

Farallon = Farallon Consulting, L.L.C.
J = result is an estimate
NE = not established
PFAS = per- and poly-fluoroalkyl substances
QC = quality control