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June 14, 2022

Andrew Rardin
Airport Environmental & Wildlife Manager
Paine Field Snohomish County Airport
3220 100th Street Southwest, Suite A
Everett, Washington, 98204
(andrew.rardin@snoco.org)

Re: Opinion pursuant to WAC 173-340-515(5) on Remedial Action for the following Hazardous Waste Site:

- **Site Name:** TECT Aerospace Everett
- **Site Address:** 2933 109th Street Southwest, Everett, WA, 98204
- **Facility/Site No.:** 17392
- **Cleanup Site ID No.:** 12071
- **VCP Project No.:** NW3328

Dear Andrew Rardin:

The Washington State Department of Ecology (Ecology) received your request for an opinion on cleanup work planned at the former TECT Aerospace Everett facility (Site). This letter provides our opinion. We are providing this opinion under the authority of the Model Toxics Control Act (MTCA), Chapter 70A.305 RCW.

Issue Presented and Opinion

Does the proposed Work Plan *Addendum No. 2 – Phase III Remedial Investigation/Feasibility Study Workplan (November 2021 WP)* meet the stated objectives with respect to Site data gaps?

NO. Ecology has determined that additional work is necessary to sufficiently characterize soil and groundwater contamination per MTCA requirements.

Description of the Site

This opinion applies only to the Site described below. The Site is defined by the nature and extent of contamination associated with the following releases:

- Diesel (TPH-D-) and oil (TPH-O)- range total petroleum hydrocarbons, benzene, chromium,

tetrachloroethene (PCE), trichloroethene (TCE), cis-1,2-dichloroethene (DCE), and vinyl chloride into the soil.

- Gasoline-range TPH (TPH-G); TPH-D; TPH-O; benzene; PCE; TCE; cis-1,2-DCE; vinyl chloride; 1,1,1-trichloroethane, (TCA); 1,4-dioxane; and arsenic into the groundwater.

- Benzene, TCE, and vinyl chloride into the soil gas.

Enclosure A includes a detailed description and diagrams of the Site, as currently known to Ecology.

Please note a parcel of real property can be affected by multiple sites. At this time, we have no information that the parcels associated with this Site are affected by other sites.

Basis for the Opinion

This opinion is based on the information contained in the documents listed in **Enclosure B**.
A number of these documents are accessible in electronic form from the Site web page[1]. The complete records are kept in the Central Files of the Northwest Regional Office of Ecology (NWRO) for review by appointment only. Visit our Public Records Request page[2] to submit a public records request or get more information about the process. If you require assistance with this process, you may contact the Public Records Officer at publicrecordsofficer@ecy.wa.gov or 360-407-6040.

This opinion is void if any of the information contained in those documents is materially false or misleading.

Analysis and Opinion

Based on a review of the *November 2021 WP*, Ecology has determined:

- **Remaining Soil Data Gaps**

  Ecology concurs with your use of standard Method B cleanup levels as screening levels for identifying Site contaminants of concern (COCs) in soil. The Site meets the definition of an Industrial property as defined in WAC-173-340-200 and WAC-173-340-745(1)(a)(i), therefore Method C cleanup levels may be considered at the Site once it has been fully characterized.

  Based on results presented in the *Interim Remedial Investigation Data Report*, dated December 31, 2019 (*2019 Interim RI Report)*, soil with concentrations of PCE; TCE; cis 1,2-DCE; and vinyl chloride (collectively CVOCs) exceeding Site screening levels are present to the east of buildings C-19, C-21, and C-23, and to the north, west, and south of the former Building C-29/Fuel Farm area (see **Enclosure A**). The vertical extent of soil contaminated with CVOCs has not been constrained in the former Building C-29/Fuel Farm area.

[1] https://apps.ecology.wa.gov/cleanupsearch/site/12071
[2] https://ecology.wa.gov/publicrecords

Ecology concurs with your planned locations of shallow soil borings to constrain the boundaries of soil contaminated with CVOCs at the Site (see **Enclosure A, Figure 9**). Proposed boring locations are well situated to constrain the limits of soil contaminated with CVOCs to the east of Buildings C-19, C-21, and C-23 and to the west and south of the former Building C-29/Fuel Farm area. Vertical delineation of contaminated soil in the former Building C-29/Fuel Farm area will be accomplished with a boring planned in the area with the highest concentrations of CVOCs.

Based on results from RISB-13, additional boring(s) are needed to the west and south of building C-22 to constrain the lateral and vertical extent of soil contaminated with total chromium. As discussed below, groundwater with concentrations of arsenic above screening levels also exists in this area.

- **Remaining Groundwater Data Gaps**

Ecology concurs with your use of standard Method B cleanup levels as screening levels for groundwater at the Site. Groundwater at the Site should be considered potable in accordance with the criteria in WAC 173-340-720(2).

Based on results presented in the *2019 Interim RI Report*, shallow groundwater with concentrations of CVOCs exceeding Site screening levels is present to the east of buildings C-19, C-21, and C-23 and to the north, west, and south of the former fuel farm and former building C-29. The lateral extent of deep groundwater containing CVOCs above Site screening levels has not been constrained to the north and west of the former Building C-29/Fuel Farm area.

Ecology concurs with your planned locations of borings to constrain the limits of TPH, CVOCs, and arsenic contamination in shallow groundwater at the Site. Proposed sample locations to the east of building C-19, C-21, and C-23 and to the north, west, and south of the former Building C-29/Fuel Farm areas are well situated to constrain the lateral extent of contaminated shallow groundwater (see **Enclosure A, Figure 9**).

The planned locations of deep groundwater monitoring wells are well situated to constrain downgradient migration of CVOCs. Depending on the results of the shallow groundwater investigation to the southwest of the former Building C-29/Fuel Farm area, it may be necessary to install an additional upgradient deep groundwater monitoring well to constrain the limits of CVOC contamination in regional groundwater.

Additional groundwater samples are needed to the southwest of building C-22 to constrain the extent of arsenic contamination in groundwater. Due to the increased turbidity common in grab groundwater samples, submitting filtered and unfiltered samples for analysis of total and dissolved arsenic is recommended.

Additional analyses are needed from wells and borings planned for analysis of TPH-D and –O. Groundwater samples analyzed for these compounds should be analyzed for carcinogenic polycyclic aromatic hydrocarbons (cPAHs) and naphthalene according to Table 830-1 of the

MTCA regulation and Table 7.2, page 104, in the *Guidance for the Remediation of Petroleum Contaminated Sites*[3], Ecology Publication No. 10-09-057. Also, please note on page 98 of the guidance that diesel and oil fractions of TPH in soil and groundwater should be added together and compared to the respective Method A cleanup levels.

- **Vapor Intrusion**

  Ecology concurs with your use of standard Method B cleanup levels as screening levels for identifying contaminants in soil gas and indoor air. Please note that Ecology no longer differentiates between shallow and deep soil gas, please continue using shallow soil gas screening levels regardless of depth of soil gas sample.

  Based on indoor air data presented in *Site Investigation Report, Building C-19 Indoor Air Evaluation and Monitoring Report* dated December 15, 2021, Ecology concurs that vapor intrusion is not an exposure pathway at building C-19. The benzene concentration in indoor air samples exceeded the Method B cleanup level in one location, after the benzene concentration measured in the ambient air sample was subtracted from indoor air sample concentrations. Due to the lack of concentrations of benzene above Method C screening levels in soil gas below the building, the use of the building for aircraft manufacturing, and the proximity to an active runway, concentrations of benzene above the cleanup level in indoor air are not likely a result of vapor intrusion. Other analytes were not detected above Method B cleanup levels.

  Indoor air samples collected from Building C-23 contained TCE above the Method B cleanup level, but below Method C cleanup levels for industrial use. Ecology concurs that additional sampling in Building C-23 is not needed at this time. The Site meets the definition of an industrial property in WAC-173-340-200 and WAC-173-340-745(1)(a)(i), therefore Method C cleanup levels are appropriate for indoor air at the Site.

  Depending on the results from shallow groundwater investigations in the former Building C-29/Fuel Farm area, additional sub-slab and/or indoor air sampling may be necessary in the office wing of Aviation Technical Services, located to the west of this area. Soil gas results from this area presented in the *2019 Interim RI Report* contained vinyl chloride above Method B screening levels in one location.

- **Remedial Investigation Report**

  The outline of the planned Remedial Investigation (RI) report presented in the September 2018 *Draft Remedial Investigation/Feasibility Study Work Plan (September 2018 RIWP)* appears to meet the criteria in WAC 173-340-350 (7). In addition to the content and figures mentioned in the *September 2018 RIWP*, the completed RI report should also include the following:

  - A summary table and discussion of contaminant screening levels by media (soil, soil gas/air, and groundwater);

[3] https://apps.ecology.wa.gov/publications/SummaryPages/1009057.html

- A description of points of compliance for each media;

- A table containing well construction details for all permanent monitoring wells on the Site, including top-of-casing elevations surveyed to the North American Vertical Datum of 1988 (NAVD88), screen intervals, total depth, well diameter, and recent and historic depth to water measurements; and

- Laboratory reports for soil, groundwater, and soil gas analyses conducted during Phases I, II, and III of RI investigations.

- Ecology appreciates your evaluation of the need for a Terrestrial Ecological Evaluation (TEE) detailed in the *September 2018 RIWP*. A properly completed TEE form[4] is required per WAC 173-340-7490 to determine if cleanup levels that are protective of terrestrial species are applicable to the Site. If the Site does not qualify for an exclusion, then the process outlined in WAC 173-340-7490 must be followed to determine protective cleanup levels for the Site.

Limitations of the Opinion

1. Opinion does not settle liability with the state.

Liable persons are strictly liable, jointly and severally, for all remedial action costs and for all natural resource damages resulting from the release or releases of hazardous substances at the Site. This opinion **does not**:

- Resolve or alter a person's liability to the state.
- Protect liable persons from contribution claims by third parties.

To settle liability with the state and obtain protection from contribution claims, a person must enter into a consent decree with Ecology under RCW 70A.305.040(4)[5].

2. Opinion does not constitute a determination of substantial equivalence.

To recover remedial action costs from other liable persons under MTCA, one must demonstrate that the action is the substantial equivalent of an Ecology-conducted or Ecology-supervised action. This opinion does not determine whether the action you performed is substantially equivalent. Courts make that determination. *See* RCW 70A.305.080[6] and WAC 173-340-545[7].

3. State is immune from liability.

[4] https://fortress.wa.gov/ecy/publications/SummaryPages/ECY090300.html
[5] https://app.leg.wa.gov/rcw/default.aspx?cite=70A.305.040
[6] https://app.leg.wa.gov/rcw/default.aspx?cite=70A.305.080
[7] https://app.leg.wa.gov/wac/default.aspx?cite=173-340-545

The state, Ecology, and its officers and employees are immune from all liability, and no cause of action of any nature may arise from any act or omission in providing this opinion. *See* RCW 70A.305.170(6)[8].

Contact Information

Thank you for choosing to clean up the Site under the Voluntary Cleanup Program (VCP). After you have addressed our concerns, you may request another review of your cleanup. Please do not hesitate to request additional services as your cleanup progresses. We look forward to working with you.

For more information about the VCP and the cleanup process, please visit our web site: www.ecy.wa.gov/vcp. If you have any questions about this opinion, please contact me by phone at (206) 459-6287 or e-mail at David.Unruh@ecy.wa.gov.

Sincerely,

David Unruh
NWRO Toxics Cleanup Program

Enclosures (2): A – Description and Diagrams of the Site
B – Basis for the Opinion: List of Documents

cc: Gerald Ninteman, Landau Associates (jninteman@landauinc.com)
Sonia Fernandez, VCP Coordinator (sonia.fernandez@ecy.wa.gov)

[8] https://app.leg.wa.gov/rcw/default.aspx?cite=70A.305.170

Enclosure A

Description and Diagrams of the Site

Site Description

This enclosure provides Ecology's understanding and interpretation of Site conditions and forms the basis for the opinions expressed in this letter.

Site: The Site is defined as releases of the following at 2933 109th Street Southwest in Everett, Snohomish County, Washington (Property, **Figure 1**):

- Diesel (TPH-D-) and oil (TPH-O)- range total petroleum hydrocarbons, benzene, chromium, tetrachloroethene (PCE), trichloroethene (TCE), cis-1,2-dichloroethene (DCE), and vinyl chloride into the soil.
- Gasoline-range TPH (TPH-G); TPH-D; TPH-O; benzene; PCE; TCE; cis-1,2-DCE; vinyl chloride; 1,1,1-trichloroethane, (TCA); 1,4-dioxane; and arsenic into the groundwater.
- Benzene, TCE, and vinyl chloride into the soil gas.

The Property consists of one irregularly-shaped 39.17-acre parcel with the Snohomish County parcel numbers 28042200400100, 28042200400101, 28042200400102, 28042200400104, 28042200400105, and 28042200400107. The Property is located east of 36th Place W, north of 112th Street SW, and west of Minuteman Drive. The property is located approximately 0.5 miles south of 100th Street SW.

According to MTCA, the Site is defined as all areas where contamination has come to be located. Currently the Site boundary is not fully delineated.

Area and Property Description: The Property is located in a mixed commercial and industrial area. The Property is currently developed with 10 irregularly-shaped multi-story, multi-tenant commercial and light industrial buildings (**Figure 2**).

The current uses of surrounding properties include:

- Aircraft storage and runways are located to the north;
- Aerospace manufacturing facilities and parking lots are located to the south;
- Airport runways immediately east of the Property, and a recycling facility and transfer station located further east; and
- Airport runways located to the west of the Property.

Property History and Current Use: The Property was first developed as an airport by Snohomish County in 1936. It was leased by the County to the US Army Air Corps from 1940 to 1948. The current layout of the airport was established by 1942.

Building C-19 was initially developed with barracks associated with military operations at the Site. Building C-19 was constructed in 1979 and was used for aerospace manufacturing from its construction to 2014. A metal fabrication company and a sign company currently occupy the building.

The construction of the buildings C-20, C-21, C-22, and C-23 began in the 1950s. An oil shed was added to the east side of Building C-23 in 1978, and an annex was added to the north side in 1987. These buildings have been used for aerospace manufacturing since their construction. Manufacturing processes included metal fabrication, welding, and painting. Buildings C-20, C-21, and C-22 are currently unoccupied; Building C-23 is still currently in use for aerospace manufacturing.

Building C-29 was constructed for chemical storage before 1947. It was used for metal fabrication from 1965 to 1996, and was demolished in 1996. The former fuel farm was developed beginning in the 1940s for storage and dispensing of aviation fuels until 1996. Records suggest at least three underground storage tanks (USTs) remain in place.

Sources of Contamination: The sources of chlorinated volatile organic compound (CVOC) contamination (including tetrachloroethene (PCE), trichloroethene (TCE), cis-1,2-dichloroethene (DCE), vinyl chloride, and 1,1,2-trichloroethane in soil, groundwater, and soil gas) include: releases from the degreaser collection vault located in the southwest corner of Building C-19; a sump and drainage trench in the Building C-20, C-21, and C-22 complex; and chemical storage in former Building C-29.

Total petroleum hydrocarbon (TPH) and benzene contamination in soil, groundwater, and soil gas originated from cutting and lubricating oil storage and use at all buildings on Site, and aviation fuel storage at the former fuel farm in the northwest portion of the Site beginning in 1993.

Arsenic and chromium contamination to soil and groundwater at the Site is interpreted to be the result of metal fabrication operations at the Site since its initial development. Metals were first detected in soil and groundwater samples in 1999. Site features described above are shown on **Figure 2**.

Physiographic Setting: The Site is located within the Puget Sound Lowland Physiographic Province, a north-south trending structural and topographic depression that is bordered on its west side by the Olympic Mountains, and to the east by the Cascade Mountain foothills. The Puget Sound Lowland is underlain by Tertiary volcanic and sedimentary bedrock, and has been filled to the present day land surface with Pleistocene-aged glacial and nonglacial sediments.

The Site is located on the western side of an upland plain between Puget Sound and the Snohomish River, known as the Intercity Plateau. The Site is situated at an elevation of approximately 600 feet above mean sea level (amsl). The land surface at the property is generally flat. Approximately 3 miles west of the Site, the land surface slopes downward toward the Puget Sound.

Surface/Storm Water System: The nearest surface water bodies are wetlands located approximately one-half mile southwest of the Site. Stormwater drains via sheet flow to catch basins and is discharged to the City of Everett stormwater system.

Ecological Setting: Properties to the north, south, east, and west are zoned for commercial and

light industrial use. Land surfaces on the Property are mostly covered with buildings and asphalt or concrete pavement, with some small landscaped areas covered with grass, trees, and bushes.

Geology: The geologic map of the region[1] indicates that the Site is underlain by Vashon Till (Qvt), which is a dense layer of unsorted sand, gravel, and boulders in a matrix of silt and clay. Underneath the Vashon Till is Vashon Advance Outwash, a thick layer of stratified sand and gravel. Vashon Advance Outwash is exposed to the west of the Site in Big Gulch.

Soils observed in borings advanced at the Site consist of 2 to 7 feet of loose fill soils underlain by dense, gray sand with silt to silty sands, to the maximum exploration depth of 93 feet below ground surface (bgs), interpreted to be glacial till. These soils are underlain by dense, light brown to gray-brown sands to sandy silts to the maximum exploration depth of 152 feet bgs, interpreted to be glacial advance outwash.

Groundwater: From 1994 to 2018, 14 permanent monitoring wells were installed to monitor shallow, perched groundwater at the Site. Wells are installed with screened intervals from 4 to 9 feet bgs (RIGW-55) to a maximum of 14.5 to 24.5 feet bgs (MW1). Monitoring well locations and screen intervals are displayed on **Figure 3**.

Depth to water in the perched groundwater system ranges from 1 to 15 feet bgs and appears to be seasonal, as some wells at the Site only contain water during the wet season. Groundwater flow in the vicinity of Building C-19 appears to be to the south-southeast. Current information on groundwater flow direction in the perched groundwater system is not available.

In 2000 three deep groundwater monitoring wells (DW1 through DW3) were installed at the Site, and screened from 137-147 feet bgs (DW1 and DW2) and 133-143 feet bgs (DW3). In 2018 and 2019, four additional deep groundwater monitoring wells were installed (RIDW-1 through RIDW-4), with screened intervals at approximately 135 to 150 feet bgs (**Figure 3**). Groundwater was encountered in deep wells at the Site at an elevations ranging from 467.84 feet above the North American Vertical Datum of 1988 (NAVD88; RIDW-1) to 467.47 feet NAVD88 (DW2). Groundwater flow in the deep aquifer is oriented north-northwest (**Figure 4**).

Water Supply: Drinking water is supplied to the Property by water mains operated by the City of Everett. Water for the City is sourced from the Spada Reservoir, located approximately 30 miles east of the Site. The Site is located approximately 3 miles north of the closest 10-year wellhead protection zone of a water supply well.

Release and Extent of Soil and Ground Water Contamination: Table A-1 summarizes previous investigations and remedial actions. Detail views of investigation areas are referenced in the table and provided in **Figures 5 through 8**. Locations of borings and monitoring wells proposed in the November 2021 Work Plan are shown in **Figure 9**.

[1] https://ngmdb.usgs.gov/Prodesc/proddesc_7184.htm

TABLE A-1

Study Area	Date	Investigations	Screening Level Exceedances
Building C-19, Figure 5	1993	**Phase 1 ESA** – Manufacturing operations including a 1,1,1 TCA storage tank, dip tank, oil drum storage. Water soluble cutting fluids. Degreaser pit (15x40x8 ft) in southern corner of the building. A sump in SE corner collected spilled 1,1,1-TCA. Groundwater also reportedly seeped into the sump. TCE was also potentially used on the Site.	N/A
	1994, 1995	**Degreaser preliminary investigation** – 1994: Two test pits advanced below the base of the slab in the area of the degreaser pit. Grab groundwater samples were collected from water seeping into open test pits. 1995: 13 additional samples from 0.5 ft to 2.5 ft bgs.	• Concentrations of TCE were detected above Method A in soil • TCE, 1,1,1-TCA, 1,1-DCE, VC above Method A in GW
	1999	**C-19 and C-29 Preliminary investigation** – Groundwater samples were collected from three wells installed in 1996 (SCPWD-2 to -4). Shallow groundwater was encountered at 2.5 to 7 feet bgs.	• TCE above Method A in all wells • PCE above Method A in SCPWD-3 • VC above Method A in SCPWD-2, -3
	2000	**Deep aquifer investigation** – Deep monitoring well DW1 installed SW of Building C-19. Deep aquifer groundwater was encountered at 133 feet bgs.	• TCE above Method A in DW1.
	2005	**Shallow soil and perched GW investigation** – 20 shallow soil borings (GP1 to GP20) installed near building C-19.	• TCE was not detected above 5 ft bgs, no surface release. • Concentrations of TCE above Method A were detected in groundwater in five of 20 borings.
	2005 to 2010	**Petroleum-contaminated soil investigation** – 2005-6: Soil samples collected below slab, depth not specified in summary. Between 2005 and 2010, 121 soil samples from 65 locations were collected. 3 grab GW samples were collected from the south end of the building, and one from the east end.	• TPH-D, TPH-O were detected above Method A in southern and central portion of building in soil. • PAHs detected above Method B in locations with TPH exceedances. • TPH not detected in GW

Study Area	Date	Investigations	Screening Level Exceedances
Building C-19, Figure 5	2011	**Petroleum-contaminated soil removal** – Shallow contaminated soil was removed from "Bays 1, 2, and 3" (northern, central, and southern areas of Building C-19 respectively). A total of 88 confirmation soil samples were collected from excavation extents. Ecology issued an NFA for the portion of the property contaminated with TPH (VCP NW2552, CSID 3808).	• TPH-D and TPH-O not detected above Method A in any confirmation samples.
	2019	**Phase I RI Investigation** – 13 shallow soil borings were advanced across the Site for collection of soil, groundwater, and/or soil gas samples. Groundwater samples were collected from existing monitoring wells SCPWD-2 through -4. Two new deep aquifer groundwater monitoring wells (RIDW-1 and -2) were also installed. **Phase II RI Investigation** – Three shallow soil borings were advanced across the Site for collection of soil, groundwater, and soil gas samples.	• TPH was not detected above Method B in any of the 5 soil samples submitted for analysis. • CVOCs were detected in soil above Method B in 5 out of the 16 borings sampled from depths of 7 to 25 feet bgs. • Benzene was detected in groundwater above Method B in one boring to the northeast of the building. • Concentrations of CVOCs in groundwater exceeded Method B cleanup levels in 12 out of 15 groundwater samples. The highest concentrations of CVOCs occurred in samples collected southwest of the building. • TCE exceeded Method B screening levels in 2 of 4 soil gas samples collected from within the building footprint.
Building C-19, Figure 5	2021	**Indoor air sampling and monitoring well installation –** Conducted a building survey, collected four air samples, and one sub-slab soil gas sample to evaluate TCE vapor intrusion risk. Two shallow groundwater monitoring wells were installed in the parking lot southwest of former Building C-29 to monitor concentrations of VOCs in groundwater.	• Benzene was detected above Method B screening levels in one of three indoor air samples (IA-02) after background correction. 1,2-DCA was also detected above Method B in the same sample. • Soil and groundwater samples were not collected during installation of RIGW-1 and -2.

Study Area	Date	Investigations	Screening Level Exceedances
Buildings C-20, -21, -22, -23, Figure 6, Figure 7	1993	**Phase I ESA** – Manufacturing included metal fabrication operations (C-21), molten lead and alloy tanks (C-22), metal stretching machine and sump (C-22), glycol quench tank (C-21). The stretching machine and sump were located in the SW corner of C-22, and collected used cutting oil. Groundwater reportedly seeped into the sump. Two USTs were removed from the N side of C-22 in 1989 with limited documentation. A drainage trench connected to the stormwater drainage system ran from C-22 to -20 to a detention pond.	N/A
	2017	**Building C-23 Phase I ESA** – Manufacturing included metal fabricating, waste storage, chemical storage, empty drum storage, and metal chip processing. 2,000-gallon waste antifreeze, 300-gallon evaporator, and 500-gallon sludge ASTs were located to the west of the building. A sump located in a shed to the east of the building collected liquid drained from the metal chips during processing. Degraded concrete in the area of the sump was observed during the investigation. At least one out-of-use heating oil UST is located southwest of the building, not decommissioned at the time of ESA.	N/A

Study Area	Date	Investigations	Screening Level Exceedances
Buildings C-20, -21, -22, -23, Figure 6, Figure 7	2017	**Phase II ESA** – A total of 28 explorations (LAI-01 to -28), advanced by hand auger and direct-push drilling rig were installed on this portion of the property. 25 soil gas samples were collected were also collected from select borings. In response to the soil gas results, six indoor air samples were collected at Building C-23. Short-term (8 hr) and long-term (21 day) integrated samples were collected.	• TPH-D and –O were detected above Method A in 9 of 21 samples. • TCE was detected in 4 of 17 samples collected from 3 locations at depths from 8 to 15 feet bgs. • TCE was detected in soil gas above Method B screening levels in 13 locations. • Vinyl chloride, chloroform, 1,1-dichloroethane, 1,3-butadiene, and benzene were detected above Method B screening levels for soil gas in 21 of 25 locations. • Short-term and long-term indoor air samples exceeded Method B for TCE, but were under Method C.
	2019	**Phase I RI Investigation** – 19 shallow soil borings were advanced across the Site for collection of soil, groundwater, and/or soil gas samples. One new deep aquifer groundwater monitoring well (RIDW-3) was also installed. **Phase II RI Investigation** – Two shallow soil borings were advanced across the Site for collection of soil samples. A grab groundwater sample was collected from RISB-60. One new deep aquifer groundwater monitoring well (RIDW-4) was installed	• TPH-D/O were detected in soil above Method B in two borings, RISB-28 located in the hammer shop in building C-21, and RISB-22 to the southwest of building C-20. Samples from 11 feet bgs in RISB-28 and 6.5 feet in RISB-22 were below Method B. • CVOCs were detected in soil above Method B in 14 of 22 borings from 2 feet to 25 feet bgs, located in the northeast and southern half of the C-20 through -22 building complex. • Total chromium was detected above Method B in soil at RISB-13 on the western edge of building C-22.

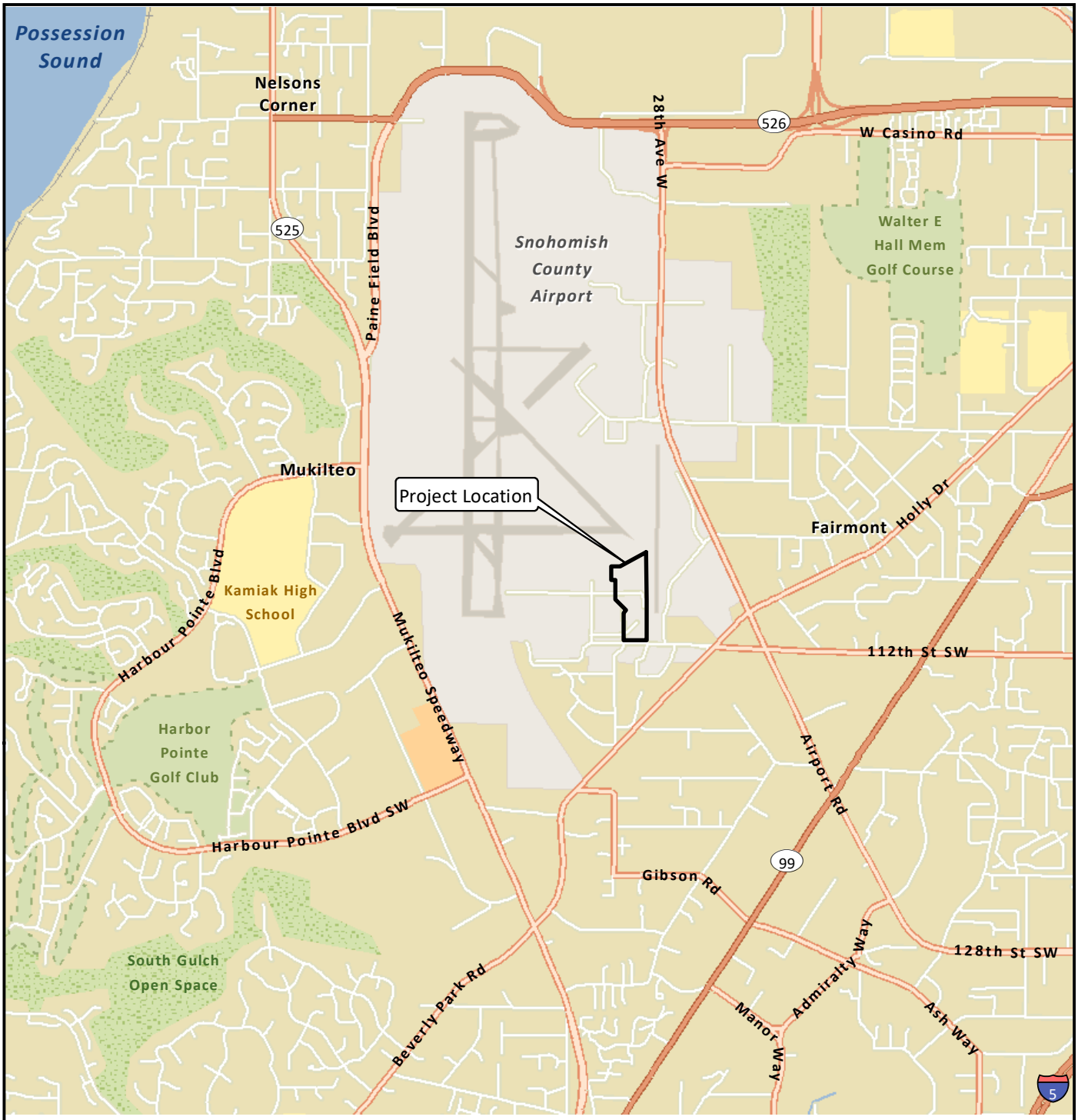
Study Area	Date	Investigations	Screening Level Exceedances
Buildings C-20, -21, -22, -23, Figure 6, Figure 7	2019	**Phase I RI Investigation** – 19 shallow soil borings were advanced across the Site for collection of soil, groundwater, and/or soil gas samples. One new deep aquifer groundwater monitoring well (RIDW-3) was also installed. **Phase II RI Investigation** – Two shallow soil borings were advanced across the Site for collection of soil samples. A grab groundwater sample was collected from RISB-60. One new deep aquifer groundwater monitoring well (RIDW-4) was installed.	• CVOCs were detected in soil above Method B in 14 of 22 borings from 2 feet to 25 feet bgs, located in the northeast and southern half of the C-20 through -22 building complex. • Total chromium was detected above Method B in soil at RISB-13 on the western edge of building C-22. • TPH was detected above Method B in groundwater in 8 of 18 samples, located in the central portion of the C-20 to -22 complex. Benzene was not detected above Method B in any of the samples. • CVOCs were detected in groundwater above Method B in 16 of 18 samples. Samples with concentrations below Method B are located to the northwest of the C-20 to -22 complex. • Arsenic was detected above Method B in groundwater in RISB-49. • CVOCs were detected above Method B in all 3 soil gas samples collected. Benzene was detected above screening levels in RISG-19.

Study Area	Date	Investigations	Screening Level Exceedances
Building C-23, Figure 7	2019	**Phase I RI Investigation** – 15 shallow soil borings were advanced across the Site for collection of soil, groundwater, and/or soil gas samples. One new deep aquifer groundwater monitoring well (RIDW-3) was also installed. **Phase II RI Investigation** – Three shallow soil borings were advanced across the Site for collection of soil samples.	• TPH were detected above Method B in soil at a depth of 2-3 feet bgs in RISB-53. No other borings contained TPH above screening levels. • CVOCs were detected above Method B in soils from 10 of 24 borings at depths ranging from 5.5 to 20 feet bgs. • Total chromium concentrations in soil exceeded Method B at 9-10 feet in RISB-48. No other locations contained metals above Method B. Groundwater samples contained TPH above Method B in 5 of 18 samples collected from the northwest and south of the C-23 building complex. • Concentrations of CVOCs in groundwater above Method B were present in 14 of 18 samples collected. Groundwater samples with concentrations below Method B were collected from the north and east of the C-23 building complex. • Arsenic concentrations exceeded Method B in groundwater in 2 of 6 samples analyzed, located west of the C-23 building complex. • TCE and vinyl chloride concentrations above Method B were detected in soil gas in one sub-slab soil gas sample in the northern portion of the machine shop and one soil gas sample to the southwest of building C-23.

Study Area	Date	Investigations	Screening Level Exceedances
Former Building C-29 / East Fuel Farm, Figure 8	1992	**UST removal** – One 12,000 gallon aviation fuel UST was removed along with 100 cubic yards of contaminated soil. Another 12,000 gallon tank was also planned for removal, but could not be located.	• Confirmation soil samples were below Method A for TPH
	1993	**Phase I ESA** – Building C-29 was described as two interconnected buildings used for chemical storage. One contained approximately 100 petroleum lubricant storage drums. Spillage was noted, but the slab appeared to be in good condition. The other building contained several hundred small containers (2 gallons or less) of paints and similar compounds	N/A
	1994	**Subsurface investigation** – Included a geophysical survey to identify remaining USTs, shallow borings, and groundwater sampling. Ten borings were advanced, four of which were completed as monitoring wells (MW-1 through MW-4). Perched groundwater was found in these 4 borings at depths of 15 to 22 feet bgs.	• Gasoline- and jet fuel-range TPH were detected in soil above Method A. • Jet-A-range TPH, BTEX, and chromium were detected in groundwater above Method A.
	1996	**Building demolition** – After the discovery of contaminated water below the building foundation following demolition, eight test pits and 4 soil borings were advanced, two of which were completed as monitoring wells.	• TCE was detected above Method A in soil • CVOCs were detected above Method A/B in groundwater. • Chromium was detected in groundwater above Method A in one location below the building footprint.
	1999	**Preliminary Investigation** – Eight groundwater samples were collected from existing monitoring wells (C29-MW1 and –MW2, SCPDW-1, HMB1, MW-1 to -4). Groundwater was encountered from 1.25 to 8.25 feet bgs.	• TCE was detected above Method A in 7 of 8 wells. • Cis-1,2-DCE was detected above Method B in 3 of 8 wells. • VC was detected above Method A in 6 of 8 wells.

Study Area	Date	Investigations	Screening Level Exceedances
	2000	**Deep groundwater investigation** – Monitoring well DW2 was installed, deep groundwater was encountered at 134 feet bgs.	• CVOCs and 1,2 dichloropropane (DCP) were detected in groundwater above respective Method A and B cleanup levels.
	2002	**Additional groundwater investigation** – a round of groundwater samples were collected from MW-1 through -4, and from deep aquifer monitoring well DW2.	• TPH-G and -D were detected above Method A in MW-4. Samples from other wells were below. • Benzene was detected above Method A in MW-1 through MW-4. • TPH and BTEX were not detected in DW2.
Former Building C-29 / East Fuel Farm, Figure 8	2019	**Phase I RI Investigation** – Eight shallow soil borings were advanced for collection of soil, groundwater, and/or soil gas samples. One new deep aquifer groundwater monitoring well (RIDW-3) was also installed. **Phase II RI Investigation** – Eight shallow soil borings were advanced, and four grab groundwater samples collected. One deep groundwater monitoring well (RIDW-4) was installed.	• The benzene concentration in soil collected from RISB-42 at 11.5 feet bgs was above Method B. Soils from the remaining 14 borings did not exceed Method B for benzene or TPH. • Concentrations of CVOCs above Method B were present in soil in 14 of 16 borings. • Chromium was detected above Method B in one sample collected from 9-10 feet bgs in RISB-48. Metals were not detected above Method B in the two other samples analyzed. • TPH were detected above Method B in groundwater in 15 of 24 samples collected from temporary and permanent monitoring wells.

Study Area	Date	Investigations	Screening Level Exceedances
Former Building C-29 / East Fuel Farm, Figure 8	2019	**Phase I RI Investigation** – Eight shallow soil borings were advanced for collection of soil, groundwater, and/or soil gas samples. One new deep aquifer groundwater monitoring well (RIDW-3) was also installed. **Phase II RI Investigation** – Eight shallow soil borings were advanced, and four grab groundwater samples collected. One deep groundwater monitoring well (RIDW-4) was installed.	• CVOCs were detected above Method B in groundwater in 23 of 24 samples collected from temporary and permanent wells, including deep monitoring well RIDW-4. • Arsenic was detected above Method B in groundwater in 10 of 18 temporary and permanent monitoring wells. • Vinyl chloride was detected above Method B screening levels in soil gas in two samples collected from RISB-42 and RISG-102.
Deep Aquifer, Figure 4	2000	**Deep aquifer investigation** – Three deep monitoring wells were installed to the southwest of building C-19 (DW1), north of former building C-29 (DW2), and northeast of building C-19 (DW3). Groundwater was encountered at approximately 132 to 134 feet bgs.	• TCE was detected above the Method B protection of groundwater cleanup level in one soil sample collected from DW2. • TCE was detected above Method A in a sample collected from DW1. • CVOCs and 1,2-DCP were detected above their respective Method A and B cleanup levels in the sample collected from DW2. • VOCs were not detected above detection limits in the soil or groundwater samples collected from DW3.
	2019	**Phase I and II RI Investigation** – Deep groundwater monitoring well installation and locations are described above. During this phase of investigation, new wells were installed, developed, and surveyed. Groundwater samples were collected from existing (DW1 to DW3) and new (RIGW-1 to -4) deep aquifer monitoring wells.	• Concentrations of CVOCs exceeded Method B in four of seven groundwater samples collected from the deep aquifer. Contamination is bounded upgradient, to the west of the Site by wells RIDW-1 through -3.



Enclosure A Figure 1

N

0 0.5 1

Miles

Data Source: Esri.

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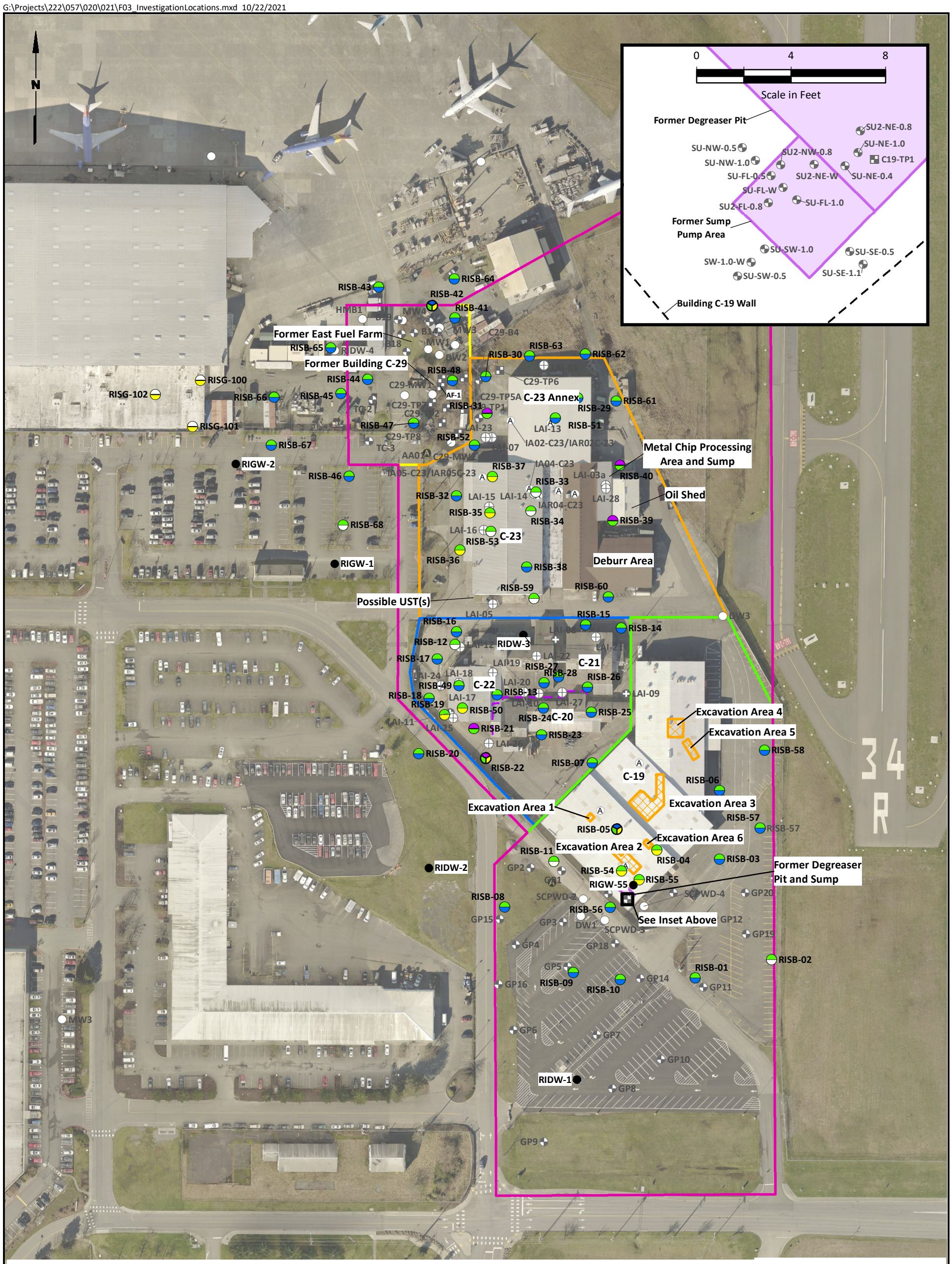
LANDAU ASSOCIATES

TECT Aerospace Leasehold Everett, Washington	**Vicinity Map**	Figure 1

G:\Projects\222\057\020\021\F03_InvestigationLocations.mxd 10/22/2021



Legend

RI Sampling Location

- RI Soil Sampling Location
- RI Soil Gas Sampling Location
- RI Groundwater Sampling Location
- RI Soil, Soil Gas, and Groundwater Sampling Location
- RI Soil and Groundwater Grab Sampling Location from Saturated Vapor Implant
- RI Monitoring Well Location

Pre-RI Sampling Location

- Ambient Air Sampling Location
- Soil Boring Location
- Indoor Air Sampling Location
- Monitoring Well Location (Sampled During RI)
- Soil and Soil Gas Sampling Location
- Soil Gas Sampling Location
- Test Pit

- Previous Remedial Action Areas
- Deep Aquifer Area of Concern
- Building C-19 Area of Concern
- Building C-20, C-21, C-22 Complex Area of Concern
- Building C-23 and C-23 Annex Area of Concern
- Former Building C-29/Former East Fuel Farm Area of Concern

Enclosure A Figure 2

Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Data Sources: AGI 1999; Landau Associates 2006; King County GIS.

0 140 280

Scale in Feet

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Pre-RI and Phase I/II RI Site-Wide Investigation Locations

Figure 3

G:\Projects\222\057\010\014\RI\Interim RI Report\F12SitewideGWDioxaneTCA.mxd 12/29/2019

Legend

Color Coding Key

- Concentration Exceeded Site Screening Levels for One or More Analytes
- One or More Analytes were Detected, but did not Exceed Site Screening Levels
- Analysis was Conducted, but Results were not detected above Laboratory Reporting Limits
- Analysis was not Conducted at this Location

Sampling Locations

- Ambient Air Sampling Location
- Indoor Air Sampling Location
- Monitoring Well Location
- Soil Boring Location
- Soil and Soil Gas Sampling Location
- Soil Gas Sampling Location
- Test Pit

Enclosure A Figure 3

Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Screening Levels (SLs) and Data Box Key for RI Locations Only			
Location		1,1,1-TCA (µg/L)	1,4-Dioxane (µg/L)
Screen Depth (ft)	Date		
		200	0.44

Data Sources: AGI 1999; Landau Associates 2006; King County GIS.

0 120 240

Scale in Feet

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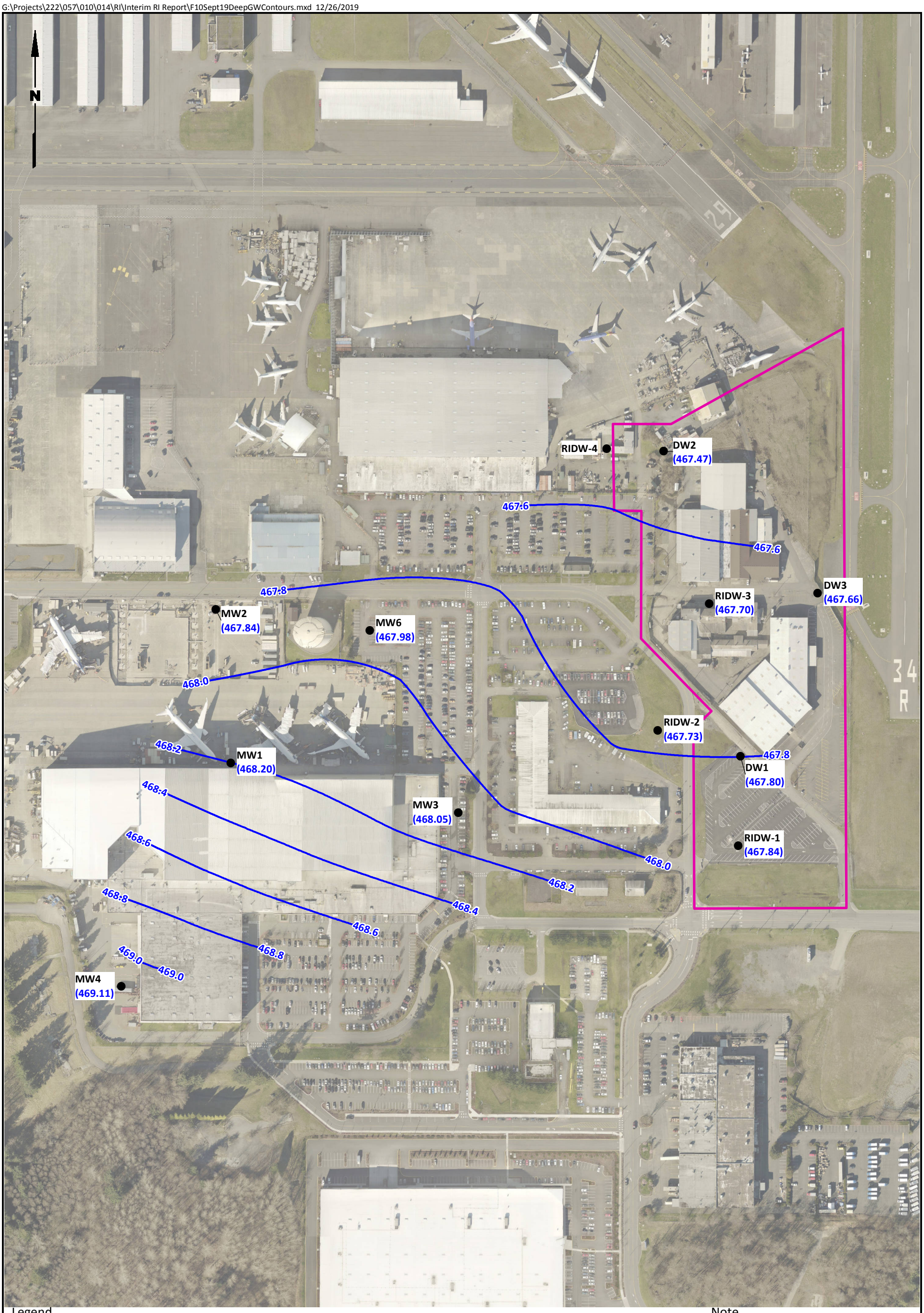
1,1,1-TCA and 1,4-Dioxane in Groundwater

Figure 12

G:\Projects\222\057\010\014\RI\Interim RI Report\F10Sept19DeepGWContours.mxd 12/26/2019



Legend

- Deep Aquifer Monitoring Well
- Groundwater Contours
- Deep Aquifer Investigation Area

0 250 500

Scale in Feet

Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Data Sources: AGI 1999; Landau Associates 2006; King County GIS.

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Enclosure A Figure 4

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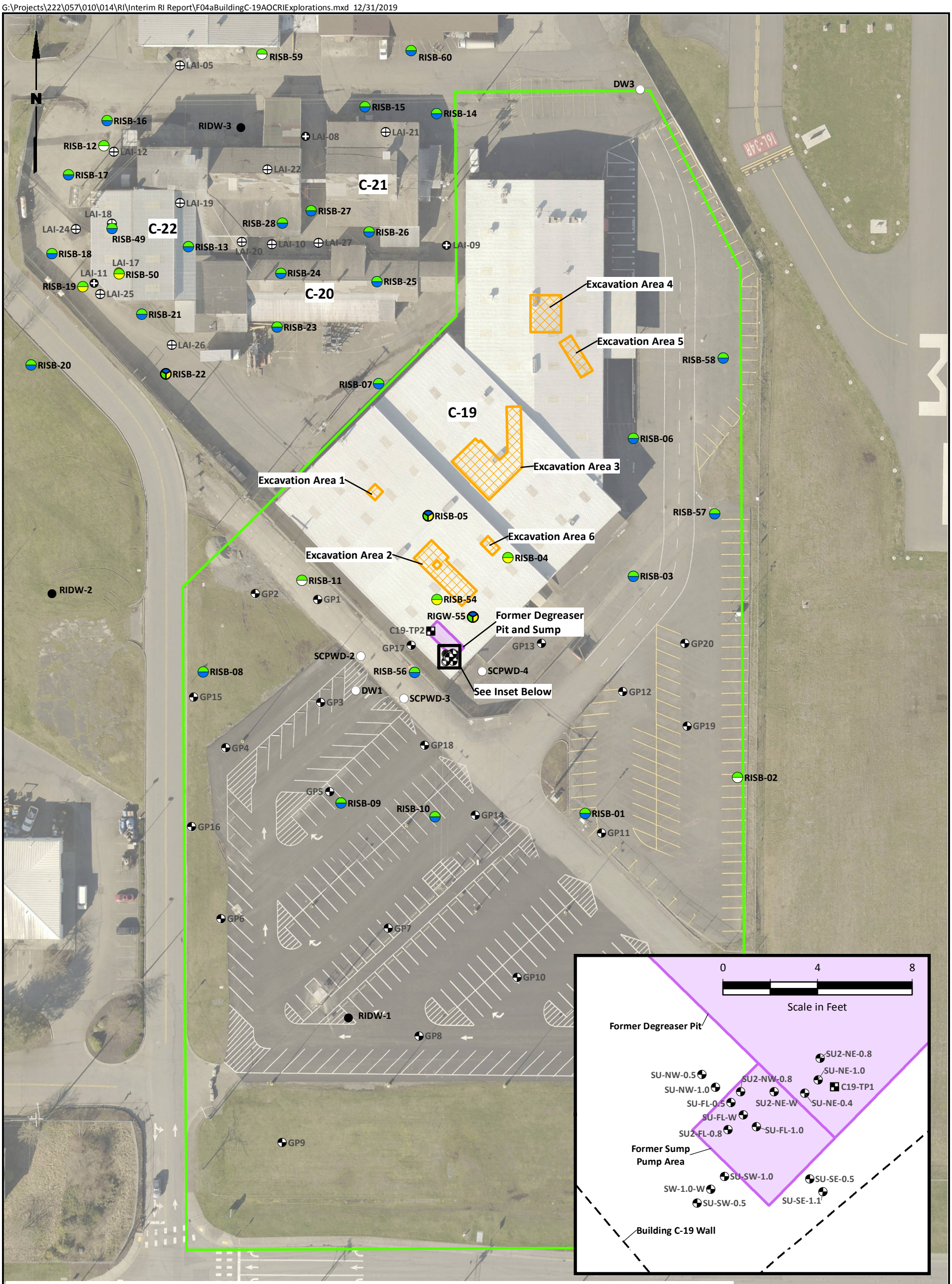
Everett, Washington

September 2019
Groundwater Contours - Deep Aquifer

Figure
10

G:\Projects\222\057\010\014\RI\Interim RI Report\F04aBuildingC-19AOCRIExplorations.mxd 12/31/2019



Enclosure A Figure 5

Legend

RI Sampling Location
- RI Soil Sampling Location
- RI Soil and Groundwater Sampling Location
- RI Soil and Soil Gas Sampling Location
- RI Soil, Soil Gas, and Groundwater Sampling Location
- RI Monitoring Well Location

Pre-RI Sampling Location
- Soil Boring Location
- Indoor Air Sampling Location
- Monitoring Well Location (Sampled During RI)
- Soil and Soil Gas Sampling Location
- Soil Gas Sampling Location
- Test Pit

- Building C-19 Investigation Area
- Previous Remedial Action Areas

Note
1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Data Sources: AGI 1999; Landau Associates 2006; King County GIS.

0 70 140
Scale in Feet

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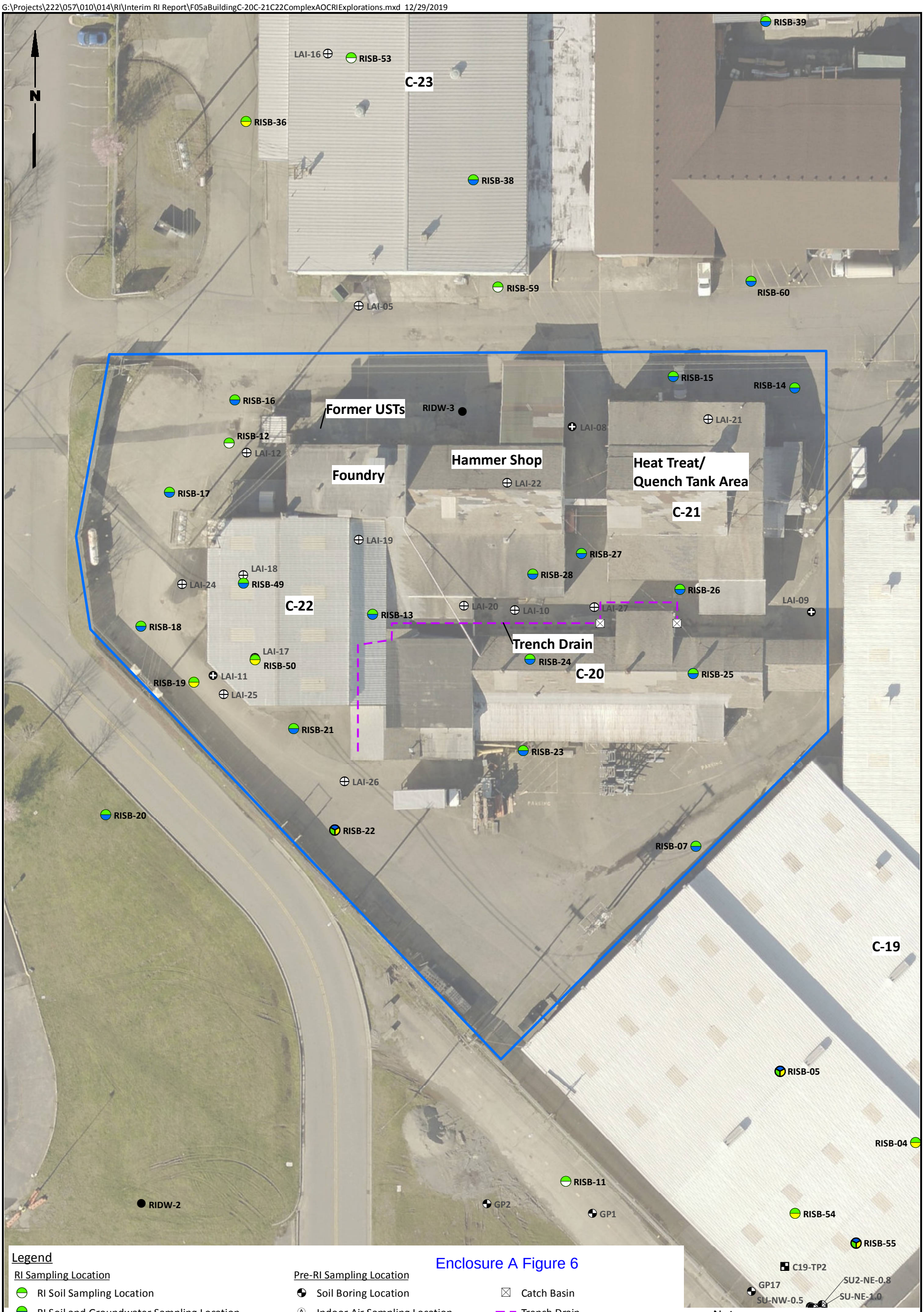
Building C-19
RI Exploration Locations

Figure
4a

G:\Projects\222\057\010\014\RI\Interim RI Report\F05aBuildingC-20C-21C22ComplexAOCRIExplorations.mxd 12/29/2019



Enclosure A Figure 6

Legend

RI Sampling Location

- RI Soil Sampling Location
- RI Soil and Groundwater Sampling Location
- RI Soil and Soil Gas Sampling Location
- RI Soil, Soil Gas, and Groundwater Sampling Location
- RI Monitoring Well Location

Pre-RI Sampling Location

- Soil Boring Location
- Indoor Air Sampling Location
- Monitoring Well (Sampled During RI)
- Soil and Soil Gas Sampling Location
- Soil Gas Sampling Location
- Test Pit
- Catch Basin
- Trench Drain
- Building C-20, C-21, C-22 Complex Investigation Area

Data Sources: AGI 1999; Landau Associates 2006; King County GIS.

0 40 80

Scale in Feet

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Everett, Washington

Building C-20, C-21, C-22 Complex RI Exploration Locations

Figure 5a

Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

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Legend

RI Sampling Location

- RI Soil Sampling Location
- RI Soil and Groundwater Sampling Location
- RI Soil and Soil Gas Sampling Location
- RI Soil, Soil Gas, and Groundwater Sampling Location
- RI Monitoring Well Location

Pre-RI Sampling Location

- Ambient Air Sampling Location
- Soil Boring Location
- Indoor Air Sampling Location
- Monitoring Well Location (Sampled During RI)
- Soil and Soil Gas Sampling Location
- Soil Gas Sampling Location
- Test Pit

Enclosure A Figure 7

- Building C-23 and C-23 Annex Investigation Area

Note

1. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Data Sources: AGI 1999; Landau Associates 2006; King County GIS.

0 50 100

Scale in Feet

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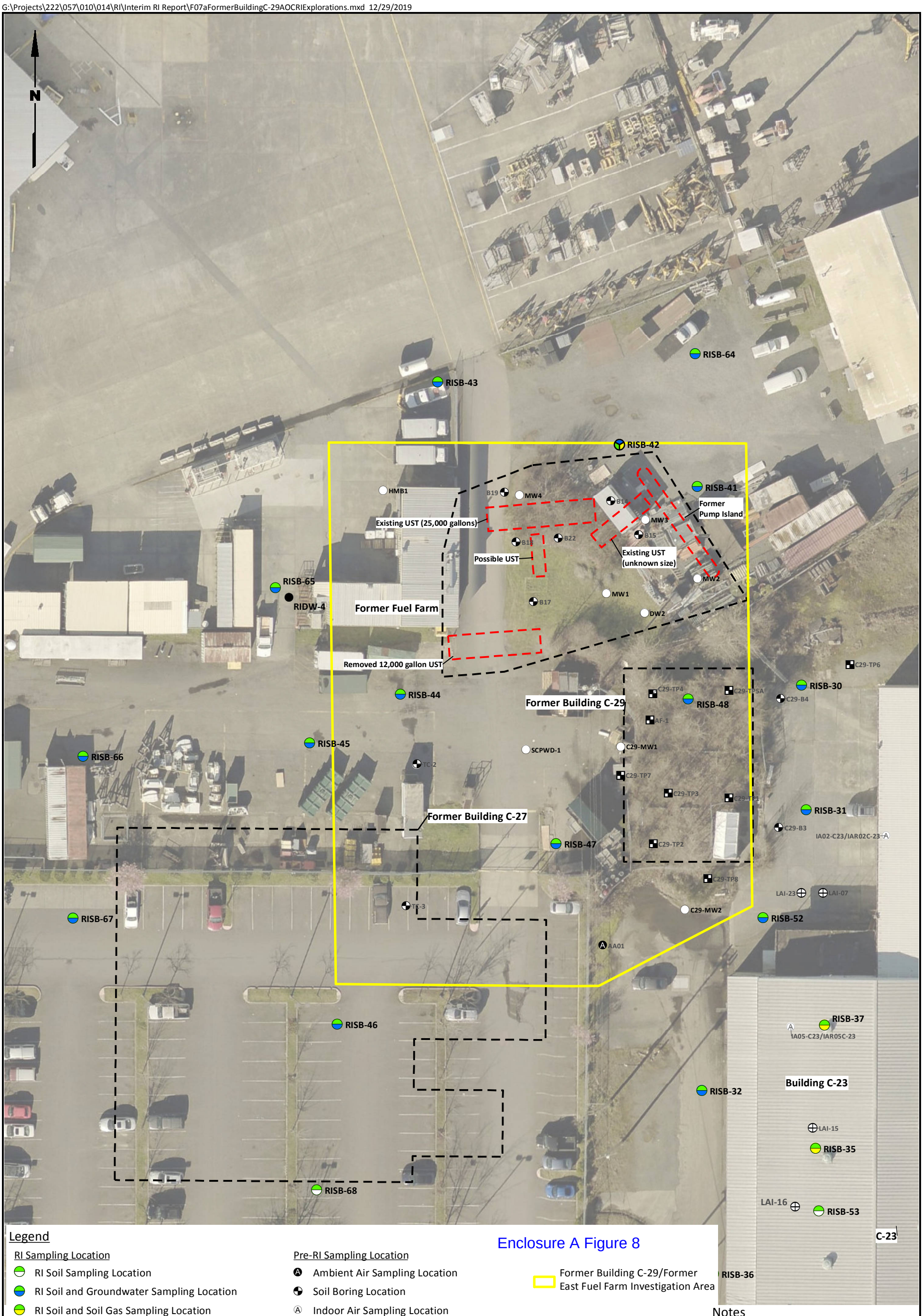
Building C-23 and C-23 Annex
RI Exploration Locations

Figure
6a

G:\Projects\222\057\010\014\RI\Interim RI Report\F07aFormerBuildingC-29AOCRIExplorations.mxd 12/29/2019



Legend

RI Sampling Location

- RI Soil Sampling Location
- RI Soil and Groundwater Sampling Location
- RI Soil and Soil Gas Sampling Location
- RI Soil, Soil Gas, and Groundwater Sampling Location
- RI Monitoring Well Location

Pre-RI Sampling Location

- Ambient Air Sampling Location
- Soil Boring Location
- Indoor Air Sampling Location
- Monitoring Well Location (Sampled During RI)
- Soil and Soil Gas Sampling Location
- Soil Gas Sampling Location
- Test Pit

Enclosure A Figure 8

Former Building C-29/Former East Fuel Farm Investigation Area

Notes

1. UST = Underground Storage Tank
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Data Sources: AGI 1999; Landau Associates 2006; King County GIS.

0 40 80

Scale in Feet

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Former Building C-29/Former Fuel Farm RI Exploration Locations

Figure 7a

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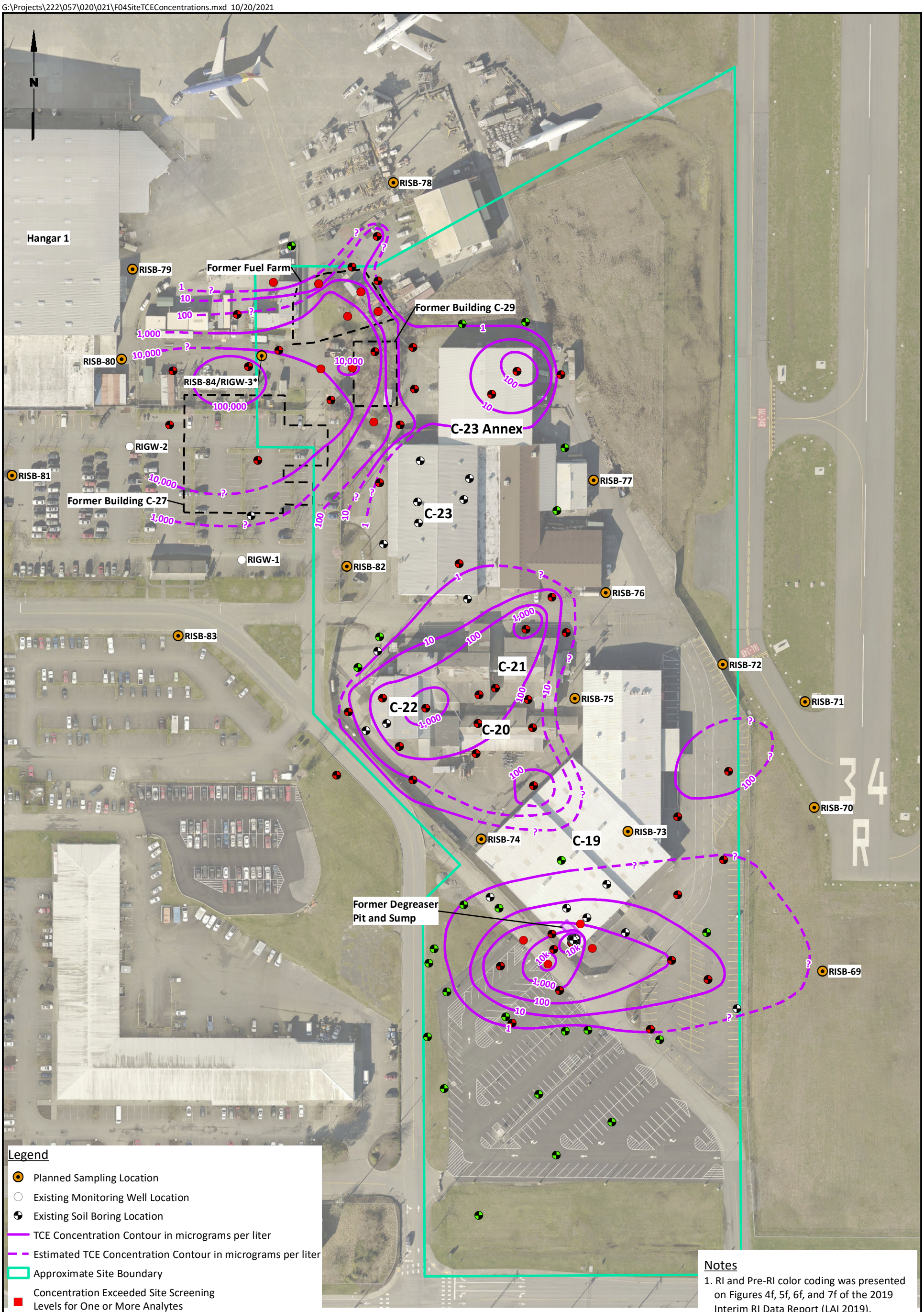

Legend

- Planned Sampling Location
- Existing Monitoring Well Location
- Existing Soil Boring Location
- TCE Concentration Contour in micrograms per liter
- Estimated TCE Concentration Contour in micrograms per liter
- Approximate Site Boundary
- Concentration Exceeded Site Screening Levels for One or More Analytes
- One or More Analytes were Detected, but did not Exceed Site Screening Levels
- Analysis was Conducted, but Results were not Detected above Laboratory Reporting Limits
- Samples Collected from this Location were not Analyzed

0 120 240

Scale in Feet

Data Sources: AGI 1999; Landau Associates 2006; King County GIS.

Notes

1. RI and Pre-RI color coding was presented on Figures 4f, 5f, 6f, and 7f of the 2019 Interim RI Data Report (LAI 2019).
2. *Monitoring Well RIGW-3 will be installed within 10 feet of RISB-84.
3. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

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Enclosure A Figure 9

TECT Aerospace Leasehold
Everett, Washington

TCE Concentration Contours in Shallow Groundwater and Planned Sampling Locations

Figure 4

Enclosure B

Basis for the Opinion:

List of Documents

1. Landau Associates, Inc. (LAI), *Site Investigation Report, Building C-19 Indoor Air Evaluation and Monitoring Well Installation, Former TECT Aerospace Leasehold Area, Snohomish County Airport, Everett, Washington*. December 15, 2021.

2. LAI, *Addendum No. 2 – Phase III Remedial Investigation/Feasibility Study Work Plan, Former TECT Aerospace Leasehold Area, Snohomish County Airport/Paine Field, Everett Washington*. November 9, 2021.

3. LAI, *Interim Remedial Investigation Data Report, TECT Aerospace Leasehold, Snohomish County Airport/Paine Field, Everett, Washington*. December 31, 2019.

4. Ecology, *Initial Investigation Field Report, TECT Aerospace Lease Area.* November 15, 2018.

5. LAI, *Draft Remedial Investigation/Feasibility Study Work Plan, Paine field TECT Aerospace Leasehold, Everett Washington*. September 19, 2018.

6. LAI, *Notification of Release, TECT Aerospace Lease Area – Paine Field Airport, Everett, Washington*, February 23, 2018.

7. LAI, *Focused Phase II Environmental Site Assessment Data Summary, TECT Aerospace, Everett, Washington*. February 8, 2018.

8. CDM, *Former All Fab Building C-19 Chlorinated Solvent Delineation, Snohomish County Airport, Everett, Washington*. February 14, 2005.

9. AGI Technologies, *Preliminary Contamination Assessment, All Fab (Former), Snohomish County Airport, Paine Field, Everett, Washington*. June 23, 1999

10. Ecology, *Site Hazard Assessment, All Fab (Former)/Paine Field, Everett, Snohomish Co.* February 1, 1997.

11. LAI, *Degreaser Pit Investigation, Building C-19, All Fab, Inc. – Paine Field, Everett, Washington*. April 25, 1994.