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Contains only Text, Tables, Figures / Appendices A, B and C

11 July 2019
File No. 129657-009

Vermont Agency of Natural Resources
Department of Environmental Conservation
Site Management Section
1 National Life Drive - Davis 1
Montpelier, Vermont 05620-3704

Attention: Mr. Gerold Noyes, PE

Subject: Vermont Yankee Site Investigation Report
NorthStar Vermont Yankee Site, Vernon, Vermont

Dear Mr. Noyes:

On behalf of NorthStar Nuclear Decommissioning Company, LLC. (NNDC) and in accordance with the Memorandum of Understanding between NNDC and the Vermont Agency of Natural Resources (#8880, dated 8 March 2018), we are pleased to be submitting the Site Investigation Report, Rev. A, for the Vermont Yankee Site (Report) located in Vernon, Vermont.

This Report presents the non-radiological data collected during the field investigation activities and the data collected as part of the first quarterly groundwater sampling event. As noted in the approval letter for the associated work plans (dated 21 June 2019), the data have been compared to the criteria published in the Investigation and Remediation of Contaminated Properties Rule, promulgated on 6 July 2019.

If you have any questions or would like to discuss any aspect of this report, please feel free to contact Nadia Glucksberg at 207-482-4623 or ngluckssberg@haleyaldrich.com at any time. We look forward to our continued collaboration on this project.

Sincerely yours,
HALEY & ALDRICH, INC.

Nadia S. Glucksberg
Program Manager

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Senior Technical Specialist

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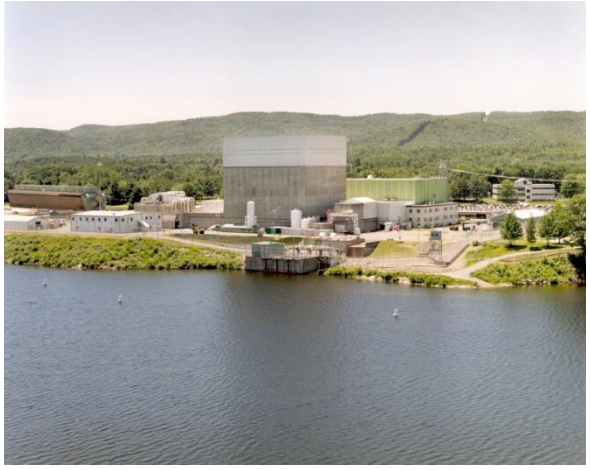
NON-RADIOLOGICAL SITE INVESTIGATION REPORT, REV. A
NORTHSTAR VERMONT YANKEE NUCLEAR POWER STATION
VERNON, VERMONT



by
Haley & Aldrich, Inc.
Portland, Maine

for
NorthStar Nuclear Decommissioning Company, LLC.
Vernon, Vermont

File No. 129657-009
July 2019

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SIGNATURE PAGE FOR

NON-RADIOLOGICAL SITE INVESTIGATION REPORT, REV. A
NORTHSTAR VERMONT YANKEE NUCLEAR POWER STATION
VERNON, VERMONT

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Certification (§35-104)

I certify under penalty of perjury that I am an environmental professional and that all content contained within this deliverable is to the best of my knowledge true and correct.

Nadia Glucksberg

Executive Summary

Haley & Aldrich, Inc. (Haley & Aldrich) has prepared this Non-Radiological Environmental Site Investigation (SI) Report on behalf of NorthStar Nuclear Decommissioning Company, LLC. (NNDC) to document the results of the comprehensive site investigation and recommend corrective actions in accordance with the Investigation and Remediation of Contaminated Properties Rule (I-Rule) and the Memorandum of Understanding (MOU) at Vermont Yankee Nuclear Power Station (VYNPS).

The VYNPS is located along the west bank of the Connecticut River, along the east side of Governor Hunt Road, in Vernon, Vermont. Construction of the plant began in 1967, and VYNPS generated power through 2014, when it shut down with a goal of preparing to be in SAFSTOR within approximately 60 years.

On 11 January 2019, the land, spent fuel and Nuclear Regulatory Commission (NRC) licenses were transferred to NNDC with a goal of decommissioning the Site on an accelerated schedule and to reach license termination under the NRC and Site closure under Vermont Agency of Natural Resources (VT ANR) with all structures removed to four feet below grade. This SI Report represents the first step in demonstrating compliance with VT ANR and the I-Rule.

During construction, shallow bedrock was blasted to allow for the deep basement structures of both the Turbine and Reactor Buildings as well as deep supporting structures including the intake and discharge facilities. Shallow soils were removed and much of the power block backfilled with structural fill. Prior to construction of the VYNPS, and based on aerial photographs, the area was open farmland and not used for industrial activities.

Groundwater at the site, as expected, flows towards the Connecticut River. Groundwater within the overburden flows at an approximate rate of 0.9 to 2.45 feet/day.

As part of this SI, 17 Areas of Concern (AOC) were identified as areas where historic operations had the potential to release non-radiological (or chemical) constituents to the environment. The Limited Non-Radiological Sampling Plan (approved by Vermont Department of Environmental Conservation [VT DEC] on 21 June 2019) was implemented to confirm/deny these potential impacts in accessible areas. It should be noted that several areas will be evaluated at a later date, once buildings are decontaminated/ removed to allow for more thorough inspections and evaluations. A summary of the findings of each AOC is provided in Table 7-1.

In general, the Site has limited impacts from plant operations. Constituents were not detected in soil at the majority of AOCs at concentrations above Residential Vermont Soil Standards (RVSS), suggesting that those soils are not significant sources of contamination. Soil samples collected at AOCs 5, 7 and 8 were associated with concentrations of Polynuclear aromatic hydrocarbon (PAH) and chlorinated solvents that exceeded RVSS. These AOCs also coincide with areas where releases have been documented and previous investigation activities have occurred. Within these AOCs, most of the impacted soils are shallow and do not extend to deeper soils or groundwater. No evidence of non-aqueous phase liquids or identification of significant new releases were identified.

Shallow groundwater has been impacted by volatile organic compounds (VOC) and perfluoroalkyl substances (PFAS) in the vicinity of the area outside the southwest corner of Turbine Building (AOC 5),

the Main Transformer (AOC 8), as well as the area near the fuel tanks (AOC 7). These areas are the only areas of the Site where a potentially complete migration pathway from soil to groundwater may exist. However, at these locations the groundwater samples were collected via open boreholes (groundwater grabs) and therefore constituent concentrations may be biased high due to elevated suspended solids in the grab samples. PFAS were not detected in the bedrock monitoring wells and the Site's potable wells but were detected in groundwater grab samples collected near the southwestern corner of the Turbine Building. Additional data are needed to evaluate if the source of PFAS is from site activities or from off-site migration.

As noted in Section 3.0, groundwater grab samples collected from open boreholes also show elevated concentrations of inorganics, but based on the samples collected from the monitoring wells (using low flow/low stress sampling methods), it is likely that these detections are an artifact of the elevated turbidity in the grab samples and do not represent actual groundwater conditions. Samples collected from the groundwater monitoring wells did not show evidence of site-related impacts.

Analytical data from the sampling of storm sewer sediments indicates that potential migration pathways from AOCs to storm water are generally insignificant. However, elevated metal concentrations were observed in the sediment at the 345-kV Switchyard Outfall (PCS 14-4).

The SI activities conducted to date show that although there are limited impacts, they are associated with areas of previously identified releases, and are consistent with the preliminary conceptual site model (CSM). Although a formal Risk Assessment has not been conducted, the detected concentrations in environmental media at the Site are not expected to pose an unacceptable risk to site workers or ecological receptors. A Risk Assessment will be conducted in accordance with the procedures outlined in Section 4 of the I-Rule after additional data are collected.

Additional characterization activities will continue with a goal of identifying and delineating shallow/limited excavations to remediate impacted soils and to meet residential criteria and reach site closure. As noted in Sections 5 and 6, additional groundwater wells should also be installed to better characterize groundwater quality to better understand the distribution of PFAS in shallow groundwater.

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List of Acronyms

AOC	Area of Concern
AOG	Advanced Off-Gas
AST	Aboveground storage tank
CAB	Containment Access Building
CAP	Corrective Action Plan
CFR	Code of Federal Regulations
COB	Construction Office Building
COC	Constituent of Concern
CSM	Conceptual Site Model
CST	Condensate Storage Tank
D&D	Decontamination and decommissioning
DQO	Data Quality Objective
DRO	Diesel Range Organics
ENVY	Entergy Nuclear Vermont Yankee
ESA	Environmental Site Assessment
ft bgs	feet below ground surface
GRO	Gasoline Range Organics
Haley & Aldrich	Haley & Aldrich, Inc.
HASP	Health and Safety Plan
HSA	Historical Site Assessment
IDW	Investigation Derived Waste
IROCCP	Investigation and Remediation of Contaminated Properties Procedure
I-Rule	Investigation and Remediation of Contaminated Properties Procedures (July 6, 2019)
ISFSI	Independent Spent Fuel Storage Installation
LNAPL	Light Non-Aqueous Phase Liquid
MDL	Method Detection Limit
MEK	methyl ethyl ketone
MOU	Memorandum of Understanding
NNDC	NorthStar Nuclear Decommissioning Company, LLC
NPDES	National Pollutant Discharge Elimination System
NRC	Nuclear Regulatory Commission
NRVSS	Non-Residential Vermont Soil Standards
ORP	Oxidation Reduction Potential
PAH	Polynuclear aromatic hydrocarbon
PCB	Polychlorinated biphenyl
PCDD	Polychlorinated dibenzodioxin
PCDF	Polychlorinated dibenzofuran
PCS	Potential Contaminant Source
PEC	Probable Effects Concentration
PFAS	Per- and Polyfluoroalkyl Substances
PFBA	Perfluorobutanoic acid
PID	Photoionization detector
PPE	Personal protective equipment
ppm	parts per million
PSB	Plant Support Building

QA/QC	Quality Control/Quality Assurance
QAPP	Quality Assurance Project Plan
RCA	Radiologically Controlled Area
RCRA	Resource Conservation and Recovery Act
REC	Recognized Environmental Conditions
REMP	Radiological Environmental Monitoring Program
RVSS	Residential Vermont Soil Standards
SAFSTOR	safe storage
SI	Site Investigation
SMAC	Site Management Activity Completed
SMS	Sites Management Section
SOP	Standard Operating Procedure
SPLP	Synthetic Precipitation Leaching Procedure
SVOC	Semi-Volatile Organic Compound
TAL	target analyte list
TCE	Trichloroethene
TCLP	Toxicity Characteristic Leaching Procedure
TEC	Threshold Effect Concentrations
TEQ	Toxicity Equivalence Concentration
TPH	total petroleum hydrocarbon
TRC	TRC, Inc.
TSCA	Toxic Substances Control Act
US EPA	United States Environmental Protection Agency
UST	Underground storage tank
UTL	Upper Tolerance Limit
VELCO	Vermont Electric Power Company
V.S.A.	Vermont Statutes Annotated
VOC	Volatile Organic Compound
VT ANR	Vermont Agency of Natural Resources
VT DEC	Vermont Department of Environmental Conservation
VT GES	Vermont Groundwater Enforcement Standard
VYNPS	Vermont Yankee Nuclear Power Station
WAC	Waste Acceptance Criteria
WMPD	Waste Management and Prevention Division

1. Introduction

Haley & Aldrich, Inc. (Haley & Aldrich) has prepared this Non-Radiological Environmental Site Investigation (SI) Report on behalf of NorthStar Nuclear Decommissioning Company, LLC. (NNDC) for the Vermont Yankee Nuclear Power Station (VYNPS), the "Site", in accordance with the Investigation and Remediation of Contaminated Properties Rule (I-Rule) and the Memorandum of Understanding (MOU) between the Vermont Agency of Natural Resources (VT ANR) and NNDC.

This report documents the results of SI fieldwork conducted in April and May 2019, in accordance with our Limited Non-Radiological Site Sampling Plan, Rev. G (Work Plan) dated February 2019.

1.1 SITE INFORMATION

1.1.1 Site Location

VYNPS is located at 320 Governor Hunt Road in Vernon, Windham County, Vermont (42°46'49" N, 72°30'57" W). It is approximately 120 acres in size, bound to the south and east by the Connecticut River; to the west by residential properties; and to the north by agricultural fields (Figure 1-1). Current Site conditions are shown on Figure 1-2.

1.1.2 Property Owner and Operator

In January 2019, NNDC purchased the property from Entergy Nuclear Vermont Yankee, LLC (ENVY) with the purpose of decontaminating and decommissioning (D&D) the Site and restoring it by 2021. Contact information for key Site personnel is provided in Table 1-1 below.

Table 1-1: NNDC Site Contacts

Name	Title	Address	Email Address	Phone Number
Corey Daniels	ISFSI Senior Manager	320 Governor Hunt Rd. Vernon, VT, 05354	cdaniels@northstar.com	802-451-5354 ext 2501
Billy Reid	Program Manager	Oak Ridge, TN	breid@northstar.com	865-384-6789
Nelson Langub	Sr. Project Manager	3933 Bridgewater Lane NW Acworth, GA 30101	nlangub@northstar.com	404-707-1587

Any significant environmental impacts to the Site are expected to be from historical operation of the Site as a nuclear power plant from 1972 to 2014.

1.2 PURPOSE

The general purpose of this investigation was as follows:

- Where accessible, investigate the presence or absence of contamination in Areas of Concern (AOC) that were identified in the Work Plan (Haley & Aldrich, 2019a); and,

- Further define the extent of contamination in AOCs where contamination was previously confirmed (i.e. Former Edson's Gulf Station and Former 5,000-gallon Underground Storage Tank [UST])

1.3 REGULATORY FRAMEWORK

Project work was completed in compliance with VT ANR (and specifically to meet the requirements set forth under the MOU dated 2 March 2018, #8880), United States Environmental Protection Agency (USEPA), and Nuclear Regulatory Commission (NRC) regulations. As VYNPS continues to work toward Site closure, there are multiple potential regulatory stakeholders and data collected as part of this effort may be used for additional assessments. Because of this, it is important to identify the applicable regulations to make sure that the samples meet the Data Quality Objectives (DQO) for each agency or program. These DQOs also support the waste characterization requirements for off-site disposal or beneficial reuse.

In addition to the requirements specified in the MOU, the following is a summary of the regulatory stakeholders that may regulate groundwater, soils and materials.

1.3.1 Vermont Agency of Natural Resources

The characterization effort was completed to evaluate Site soil conditions and groundwater quality in accordance with the I-Rule dated 6 July 2019. Analytical results for soil are compared to the Residential Vermont Soil Standards (RVSS), Non-Residential Vermont Soil Standards (NRVSS) and the Urban Background Values; analytical results for sediment are compared to the Vermont Recommended Sediment Quality Guidelines for the Protection of Aqua Biota in Freshwater Ecosystems Threshold Effect Concentrations (TEC) and Probable Effects Concentration (PEC); and analytical results for groundwater are compared to the Vermont Groundwater Enforcement Standard (VT GES).

VT ANR Site investigation and remediation programs are conducted under the guidance issued by the Sites Management Section (SMS) of the Vermont Department of Environmental Conservation (VT DEC) Waste Management and Prevention Division (WMPD). The SMS is responsible for review and approval of Site investigations and response actions when a release of hazardous materials has occurred. SMS guidance requires a SI in sufficient detail to establish a defensible Conceptual Site Model (CSM). If the data suggests that there was a release, the path forward would then include the development and implementation of selective or limited soil removals and if there are greater areas of impact, a Corrective Action Plan (CAP).

Implementation of the CAP is typically intended to result in a Site Management Activity Completed (SMAC) designation or a Certificate of Completion.

1.3.2 United States Environmental Protection Agency

USEPA still maintains the authority of addressing polychlorinated biphenyls (PCB) exceeding 50 milligrams per kilogram (mg/kg) to any state programs, although the states may impose a more stringent cleanup framework. PCBs are regulated under the Toxic Substance Control Act (TSCA) and therefore must comply with 40 Code of Federal Regulations (CFR) 761 and if over 50 parts per million (ppm) in accordance with Vermont Hazardous Waste Management Regulations (VT01 hazardous waste code).

1.3.3 Nuclear Regulatory Commission

All radiological clean-up activities will be completed under the regulatory authority of the NRC. Any areas that are identified to have co-located radiological and chemical materials shall be handled and remediated in accordance with all applicable regulations from NRC, USEPA, and VT ANR.

1.4 DEVIATIONS FROM THE WORK PLAN

The Work Plan was developed to identify if historic operations impacted environmental media at the site. The Work Plan was implemented from March 2019 through June 2019, after addressing comments from VT ANR. Documentation of ANR's comments and NNDC's responses are provided in Appendix A. It should be noted that per the MOU, NNDC must initiate field activities within a month of receiving written approval, and that this SI Report must be submitted to ANR by 11 July 2019. To meet the second requirement, NNDC received verbal approval from ANR and then proceeded to complete the program. Formal written approval was received on 21 June 2019.

As with all field programs, several deviations from the Work Plan were executed, either due to access or safety. The following list includes the deviations from the approved scope of work encountered during the field program:

- As noted above, NNDC implemented the field program in advance or written approval, so that this SI Report would be submitted by the deadline imposed by the MOU.

- Several proposed locations were not accessible and will be addressed at a later date. Most notable are those locations proposed for AOC 1 – 345kV Switchyard and AOC 2 – 115kV Switchyard, within the associated secured areas. Vermont Electric Power Company (VELCO) has a lease for the switchyards for 99 years and did not allow access. Should they grant access at a future date, those samples shall be collected. Other specific locations identified din the work plan were moved due to access or shallow refusal. Each is discussed more in Section 5.0.

- Soil samples were collected downgradient of AOC 6. Due to utilities and vehicle traffic, both direct push explorations (DP0601 and DP0602) proposed for this AOC had to be offset.

- Direct push locations were completed at all proposed locations within AOC 12. However, groundwater grab samples were unable to be collected at GW1205 and GW1206 due to overhead power lines restricting drill rig access to complete the borehole to depth.

- Outfall locations at SD1402 and SD1403 were inaccessible. The furthest downgradient catch basins of each outfall system were accessed and inspected, but no sediments were encountered. No samples were available/collected.

- At several GeoProbe® locations, refusal was encountered at depth that was not interpreted to be bedrock. At several other locations groundwater grab samples could not be obtained. To ensure that the required data were collected, a hollow-stem auger drill rig was employed to get to the required depth and to collect the proposed samples.

1.5 REPORT ORGANIZATION

The remainder of the report includes the following Sections:

- Section 2 - Site Background, including site history and current site conditions
- Section 3 - Site Setting that presents the topography, geology, hydrogeology of the region and of the Site.
- Section 4 - Site Investigation Activities, including an overview of the sampling program, and a background evaluation of site wide occurrences of vanadium in soils.
- Section 5 - Areas of Concern Investigation. This section presents the description of each AOC along with the completed investigations, findings and provides recommendations (if warranted) to address the impacted media.
- Section 6 - Groundwater (AOC 17) Groundwater is its own AOC because it underlies the Site and will be discussed in this section to identify localized impacts in the framework of site wide potential impacts.
- Section 7 - Conceptual Site Model. The CSMs for each AOC are summarized in Section 5. This section presents the CSM for the Site to identify the path forward to continue to meet the requirement of the I-Rule and Site Closure.
- Section 8 - Conclusions and Recommendations, including areas that warrant additional investigations or potential remedial activities.

2. Site Background

2.1 SITE HISTORY

This Site was initially located on farmlands that did not have historic industrial activity. The construction permit for the facility was issued by the NRC in December 1967. Since then, VYNPS has been owned and operated by several different entities. In 2002, ENVY purchased the facility. In August 2013, Entergy Corporation announced that VYNPS would not be refueled and would cease operations at the end of its current cycle. In December 2013, ENVY met with several Vermont agencies and negotiated a settlement agreement that included commitments by ENVY that VYNPS operations would cease by the end of 2014 and that ENVY would prepare a Site Assessment Study (Entergy, 2014).

In October 2014, ENVY completed the Site Assessment Study. Several areas were identified where former activities may have resulted in non-radiological impacts to site soils, sediments and groundwater, potentially significant to the decommissioning effort. Although ENVY has characterized and closed a few in accordance with then current Investigation and Remediation of Contaminated Properties Procedure (IROCCP) requirements (VT ANR, 2012) during preparation for safe storage (SAFSTOR), several more areas require further characterization as they become accessible during the decommissioning process.

On 11 January 2019, the NRC license and property ownership were transferred from ENVY to NNDC. It is NNDC's goal to complete the D&D of the plant ahead of ENVY's initial 60-year schedule. Instead of preparing the Site for SAFSTOR, NNDC will close the Site, bringing it to a greenfield condition, removing structures to four feet below grade, and removing contaminated materials and remediating environmental media as necessary.

2.2 CURRENT SITE USE

The Site is currently in the D&D phase. Buildings such as the Former North Warehouse and more recently the Construction Office Building (COB) have been removed to facilitate safe fuel storage and removal of internal components from the Reactor Building. Preparation for the demolition of the Cooling Towers is currently underway. A portion of the property is leased to VELCO for operation of their currently active electrical substation. Current site conditions are shown on Figure 1-2, Site Plan.

2.3 USES OF ADJACENT PROPERTIES

Land use in the area consists of a mixture of rural residential properties, undeveloped properties, and agricultural usage properties. Specific uses of adjacent properties area summarized in Table 2-1 below.

Table 2-1: Adjacent Property Use

Direction from Site	Current Use Description
North:	The parcel north of the Site is farmland used for growing crops and for cattle pasture.
South:	The Connecticut River; Vernon Hydro Dam, Owned by Great River Hydro; and a recreational area known as Governor Hunt Picnic Area and Boat Launch.
East:	The Connecticut River
West:	Residential properties; Governor Hunt Road; Vernon Elementary School; and Town Offices.

2.4 PREVIOUS INVESTIGATIONS

There have been a limited amount of evaluations conducted to better understand environmental conditions at the site. They include the following:

- 2001 Phase I & II Environmental Site assessment (ESA). In 2001, Environmental Compliance Services, Inc. (ECS) completed a Phase I and II Environmental Assessment (ESA) of the Site. The ESA focused on the potential release of petroleum and/or hazardous materials to soil, groundwater and surface water. They identified the following seven (7) areas of Recognized Environmental Conditions (REC), requiring further investigation:

  - Septic Systems (6),
  - Owner Controlled Areas (North Field, South Field, Area "B-2" and Area "B-5"),
  - Former and Current Underground Storage Tanks (UST),
  - Former Wood Burning Area,
  - Current Water Supply Wells (4), (currently there are only two but in 2001 there were 4 wells),
  - Primary and Secondary Transformers, and
  - Subject property Storm Water Drainage System (North and South).

  Subsurface investigations, which included the collection of soil, sediment, surface water, groundwater, septic waste, septic effluent, wastewater, and sludge/oil samples, were completed to address each of the RECs.

- 2014 Historical Site Assessment (HSA). In 2014, an HSA was completed to identify areas at the Site where chemical or non-radiological materials were used and may have been released to the environment. The HSA identified 134 potentially impacted areas. These areas were subdivided into twelve categories which included:

  - septic systems (7) (COB overflow was mistakenly counted as a seventh system, but it is a part of the COB system),
  - owner-controlled areas (16),
  - under and above-ground storage tanks (29),
  - transformers and breakers (21),
  - miscellaneous containers (24),
  - switchyards (3),
  - storm water drainage systems (5),
  - water supply wells (4),
  - chemical storage areas (4),
  - small satellite chemical and flammable material storage areas (10),
  - compressed gas storage areas (6) and
  - nearby off-site areas owned by Entergy (5).

  Eighty-two of the above listed areas were evaluated in 2001 during the ESA (ECS, 2001). Based on review of previous investigations, remedial actions, and current site conditions, Haley & Aldrich eliminated several areas listed above as they have since been addressed, no longer exist and/or were combined with other areas. The remaining areas were grouped into 17 AOCs and

within each AOC Potential Contaminant Sources (PCS) have been identified as discussed in Section 5.0 and 6.0 of this report.

- 2017 Phase I ESA. In June 2017, Normandeau Associates, Inc. (Normandeau) performed a Phase I ESA at the Site on behalf of ENVY. This Phase I ESA did not identify any new or different non-radiological RECs, controlled RECs, or historical RECs, beyond those already identified in previous Site Assessments.

- 2017. North Warehouse and John Deere Diesel Generator Building. The North Warehouse was used to store radiological and Resource Conservation and Recovery Act (RCRA) wastes. It also housed an oil burner that incinerated used oil, generated from the site equipment. The North Warehouse was demolished in November 2016 to make room for the construction of a new Independent Spent Fuel Storage Installation (ISFSI) pad, and the shallow soils investigated in support of reuse, and future site restoration. This area was also identified as an AOC and is discussed further in Section 5.4.

A summary of each report and how the findings correlate to AOCs is summarized on the CSM presented in Section 7.0.

3. Physical setting

The Site is located along the west bank of the Connecticut River, along the east side of Governor Hunt Road, in Vernon, Vermont. It is approximately 5.5 miles southeast of downtown Brattleboro, Vermont. Land use in the area consists of a mixture of rural residential properties, undeveloped properties, and agricultural usage properties.

Several geological studies have been completed at the site by Entergy, in response to the tritium release to groundwater. Figures associated with the Hydrogeological Investigation on Tritium in Groundwater (GZA, 2011) have been included in Appendix B.

3.1 TOPOGRAPHY

The VYNPS occupies a relatively flat terrace along the west bank of the Connecticut River, approximately 231 feet above mean sea level. Topography of the Site and local area slopes easterly, toward the Connecticut River, which is at an elevation of approximately 216 feet above mean sea level (Figure 1-1).

3.2 GEOLOGY

The Site is situated within the historic extent of Glacial Lake Hitchcock, on a plateau that has been dissected by streams and modified by glacial erosion. The "U" shaped Connecticut River Valley is the most prominent erosional feature in the area. The VYNPS is located in an area of lowlands and river terraces that span approximately one mile in width and border the Connecticut River. These lowlands are situated between bedrock-controlled upland areas to the east and west. The overburden geology is typical of glacial river valleys. Several phases of subsurface explorations have been conducted on Site to date. Based on that information, the Site is underlain by soils typical of glaciolacustrine deposits, ice-contact stratified drift or outwash, scattered till deposits, and floodplain deposits (i.e. sand, silt and gravel, with some clayey zones) over bedrock consisting of hard biotite. Geologic profiles are presented in Appendix B.

3.2.1 Surficial Geology

The Site is situated within the historic extent of Glacial Lake Hitchcock. Mapped surficial geology for the area indicates lacustrine and littoral sediments described as predominantly well-sorted sand and pebbly sand. Geology within the Site vicinity includes approximately 10 to 70 feet of glacially deposited soils overlying bedrock. The overburden geology is typically of glacial river valleys, with the soils consisting of sand, silt and gravel. Within the Site boundaries, much of the shallow soils within the power block, have been excavated and backfilled with structural fill.

3.2.2 Bedrock Geology

The Site is located within the Brattleboro syncline, part of the Connecticut Valley-Gaspe Synclinorium. This region is underlain by Paleozoic age metamorphic rocks. The Site is located over a fairly large pluton of the Oliverian Magma Series known as the Vernon Dome, which is comprised generally of gneiss grading from a light gray to pinkish-gray, slightly to moderately foliated, medium grained granodiorite (quartz-diorite) to granite.

3.2.3 Hydrology

The Site is located on the west bank of the Connecticut River, approximately 138 miles upstream of the mouth. Near the Site, the river forms a reservoir above the Vernon Station Hydroelectric Dam, referred to as Vernon Pond. The river generally flows from north to south and is the most significant drainage feature in the region. The flow of the river water is largely determined by the operation of dams and hydroelectric stations, including the Vernon Dam and several upstream facilities.

Onsite, the groundwater is present within the overburden at depths ranging from approximately 5 to 32 ft below ground surface (bgs). Groundwater generally flows from west to east toward the Connecticut River. Groundwater elevation data was collected in February and December 2010 with contours for both the shallow and deep monitoring wells on the figures provided in Appendix B.

The 2010 data demonstrated that groundwater flow in the shallow overburden is toward the Connecticut River. There is a localized area of higher water table elevations to the west of the power block buildings; where the Reactor and Turbine Buildings form a local barrier to shallow groundwater. Water levels are lower to the east of the power block buildings. There is a slight northerly component of flow which appears to be due partly to the flow of water around the Reactor and Turbine Buildings (see figures in Appendix B) (GZA, 2011).

Groundwater flow in the deep overburden is generally consistent with groundwater flow in the shallow overburden. As depicted in the deep groundwater contours, there is generally an eastern flow of water with a slightly northeast flow direction from the area power block to the Connecticut River.

Hydraulic conductivity tests were also performed to characterize hydrogeologic properties of the bedrock and overburden soils. These include constant head, rising head, and bedrock packer tests. Based on GZA's investigations, the hydraulic conductivities in the fill ranges from 0.01 ft/day to 3.4 ft/day. Hydraulic conductivities in the Upper Sand unit ranges from 0.5 to 17 ft/day, and the lower sand/till with hydraulic conductivities from 0.5 ft/day to 24 ft/day. It was also noted that in the shallow fill near the Advanced Off-Gas (AOG) and Condensate Storage Tank (CST) the hydraulic conductivities were at least an order of magnitude higher, ranging from 60 to 170 ft/day. These estimates translate to groundwater velocities in the overburden materials ranging from 0.9 to 2.5 ft/day (GZA, 2011).

3.2.4 Surface Water

There are no permanent streams or water courses that flow onto the Site from upgradient sources. Surface water runoff from the Site is drained via stormwater catch basins and drainpipes within the developed areas which discharge to the Connecticut River at various outfalls along the west bank. Near the center of the Site, there is a topographically low area at which water would be expected to pond during certain times of the year, though no outlet points from this area are evident. Local streams and groundwater generally flow towards the Connecticut River.

The Connecticut River is a freshwater Class B River which means that it is generally both swimmable and fishable. It flows southward for 410 miles through four states, including Vermont, New Hampshire, Massachusetts, and Connecticut. The New Hampshire border is at the shoreline by the Vernon Dam which is adjacent to the Site.

4. Site Investigation Activities

This Section presents a general summary of the field investigation program, conducted from 24 April 2019 through 15 May 2019. This work was conducted in accordance with our Work Plan (Haley & Aldrich, 2019a). A summary of the explorations and sample location coordinates are provided Table 4.0-1, and a summary of the analytical program is summarized in Table 4.0-2 and 4.0-3. Any deviations from the Work Plan that occurred during the fieldwork, as summarized in Section 1.4, are discussed in this section. This section has been organized to provide an overall summary of the field program. The findings at each AOC are presented in Section 5.

A total of 17 AOCs were identified at the VYNPS. A list of the AOCs is presented in Table 4.0-4 and each is shown on Figure 4-1. These AOCs include all previous RECs and AOCs identified in the HSA (RSCS, 2014) plus two additional AOC (parking lot areas and the railroad spur) not previously identified.

Sampling and field work were conducted in accordance with the Standard Operating Procedures (SOP) and with the Site's Quality Assurance Project Plan (QAPP) (Haley & Aldrich, 2019b). Data has been evaluated under the VT ANR regulations with an end goal of unrestricted reuse and to demonstrate that final conditions are in compliance with 10 Vermont Statutes Annotated (V.S.A.) Section 6615, as well as TSCA under 40 CFR 761 or to confirm waste disposal needs. Lists of applicable VT ANR cleanup criteria for impacted soil, groundwater, and sediments, as defined in Section 1.3.1, are presented in Tables 4.0-5 through 4.0-7[1]. Investigation activities and results for each AOC are discussed in detail in Section 5.

It is noted that the procedures that are used to determine if an AOC requires a remedial action, as described in Section 4 of the I-Rule, have not been applied in this SI Report. Rather, this SI Report evaluates analytical results with respect to the VT ANR cleanup criteria to evaluate whether the nature and extent of contamination has been delineated. The procedures for evaluation of analytical data, as described in the I-Rule, will be applied, as warranted, after site investigation activities are completed.

4.1 GENERAL SAMPLE LOCATIONS AND METHODOLOGIES

SI activities were conducted between 24 April 2019 and 16 May 2019 and included the collection of soil, groundwater and sediment samples. Samples were submitted to SGS Accutest Laboratories (Accutest) for analysis. Exploration locations are shown on Figure 4-2. Investigation for each specific AOC, along with more detailed figures and AOC-specific tables are discussed further in Section 5 of this Report. The list of SOPs used during the field program are provided in Appendix C.

4.1.1 Soil Sampling

Prior to soil sampling activities, utility clearance was conducted. Haley & Aldrich worked with NNDC to locate underground utilities. A vacuum truck was used to soft dig each direct push boring location to a minimum of 5 ft bgs. In areas where deeper utilities were known to be present, explorations were air knifed up to 15 ft bgs.

[1] In addition to the criteria specified in Section 1.3.1, the USEPA Regional Screening Levels for residential and non-residential soil were also provided in tables that evaluate soil and sediment analytical results.

Surface soil samples were collected from 0 to 0.5 ft bgs using disposable scoops. Due to the removal of shallow soil for utility clearance at each direct push exploration location, shallow soil samples (0 to 2 ft. bgs) were collected from the sidewalls of the borehole using disposable scoops. Deeper subsurface soil samples were collected using a track mounted GeoProbe® 6620DT direct push rig. Direct push explorations were advanced 4 ft into the groundwater table or 30 ft bgs, whichever occurred first. Soil was collected continuously to depth using 5-ft long disposable macro-cores. Each core was screened using a photoionization detector (PID) and logged on Soil Boring Logs included in Appendix D. At locations where refusal was encountered before the planned boring depth, a truck-mounted mobile drill was used to re-drill the boring to the desired depth.

4.1.2 Groundwater Sampling

Prior to groundwater sample collection, static water levels were collected. Wells were purged and sampled using a peristaltic pump with dedicated disposable tubing. Field parameters including depth to water, pH, turbidity, conductivity, dissolved oxygen and oxidation reduction potential (ORP) were collected during the purging process using a YSI multiparameter water quality meter. Calibration Records are provided in Appendix E. Readings were recorded on Low Flow Sampling Field Forms included in Appendix F. Once parameters were stable, samples were collected into laboratory provided glassware containing preservatives and placed on ice in coolers. The field notes are provided in Appendix G.

Groundwater grab samples were also collected during the drilling of soil borings and GeoProbe explorations. These grab samples were collected via pumps or bailers through open boreholes and therefore had higher turbidity than samples collected from monitoring wells. Data collected were intended to be used as screening level data to evaluate if a release had occurred and if a groundwater monitoring well is warranted. All groundwater grab samples have are identified with “DP” at the start of the sample nomenclature.

4.1.3 Sediment Sampling

Sediment samples were collected using a stainless-steel hand-auger or disposable scoop where outfalls were accessible. Samples were collected into laboratory provided glassware and placed on ice in coolers.

4.2 ANALYTICAL METHODS AND PROTOCOLS

Samples were collected and submitted for analysis in accordance the project-specific QAPP.

4.3 QUALITY ASSURANCE/QUALITY CONTROL

In addition to the required internal laboratory quality control/quality assurance (QA/QC) performance checks, field blanks and duplicates were collected and submitted for analysis. Data from these samples were used to validated and qualify (as necessary) the project data. Laboratory Reports are provided in Appendix H. Data validation reports are included in Appendix I.

Per the I-Rule, any compound with a reported method detection limit (MDL) above the RVSS or VT GES must be identified. With the exception of SS0705 and its duplicate, the MDL for 1,2,3-trichloropropane reported in soils ranged from 0.004 to 0.011 mg/kg, above the RVSS of 0.00311 but below the NRVSS of

0.07 mg/kg. For samples that have no detected volatile organic compounds (VOC) and all other VOC MDLs below criteria, we have assumed that there was not a specific 1,2,3-trichloropropane release, but rather will work with the laboratory to ensure future MDLs are below criteria.

The MDL used for thallium ranged from 1.0 to 3.5 mg/kg, above the RVSS of 0.73 mg/kg but well below the NRVSS of 196,100 mg/kg. Thallium was not reported above the MDL in any of the soil samples collected as part of this investigation. It is not likely that all thallium is a site-wide contaminant and laboratory detection limits will be addressed in future sampling programs to further evaluate this constituent in site soils.

Similarly, naphthalene in groundwater has been reported under both VOCs and semi-volatile organic compound (SVOC) analyses, both with MDLs above the VT GES criteria. In samples with no other VOC or SVOC detected (and with all other MDLs below criteria) we have assumed that there was not a specific naphthalene release. Coordination with the laboratory to meet MDLs will be verified with future groundwater sampling rounds, as required in our Quarterly Groundwater Monitoring Program.

It should also be noted that for several inorganic compounds, the MDLs reported from the laboratory were above the Vermont standards. The different reasons for this are discussed in the validation reports provided in Appendix I. These data will be evaluated in this report in the context of each AOC, (i.e. if the data is an expected constituents of concern (COC), based on the release history and if the reported values are within anticipated background conditions). For example, if all the inorganic compounds are reported at concentrations consistent with site or background conditions and the organic data (VOCs and SVOCs) are reported as non-detect, additional investigations may not be warranted. Each data result will be evaluated in the context of the AOC and discussed in Section 5.

4.4 INVESTIGATION DERIVED WASTE

Investigation derived waste (IDW) from this investigation program was managed in coordination with the VYNPS Health Physics department and in accordance with the Site's radiological waste program.

There was no excess soil from the direct push sampling. Soils were logged in the field and then collect for non-radiological analysis. The remaining soils were then collected for future radiological analyses and have been stored onsite under chain of custody. Soil cuttings associated with soil borings were managed at the site of excavation and if here was no indication of impacted soils or groundwater (i.e olfactory, visual, or response on the PID) the cuttings were returned to the borehole as backfill.

Groundwater purged during sampling events was drummed, sampled for radiological constituents and managed under the Site's liquid waste program.

Personal protective equipment (PPE) (gloves) and disposable equipment generated in radiologically controlled areas were disposed of under the Site's radiological waste program. PPE and disposal equipment used outside those areas were disposed of in the trash.

4.5 BACKGROUND EVALUATION FOR SOILS

Upon review of the soil data from this SI, it was noted that vanadium results were consistently above the RVSSs. These results were identified regardless of depth, location or associated AOC or PCS.

Background evaluations are permitted under Section 35-APX-B1 of the I-Rule; they require that a sampling plan be developed and approved prior to conducting the evaluation. Typical background evaluation plans propose to collect a statistically relevant number of samples from similar soils to be able to determine a) the distribution of the data (i.e. if it is normal or log normal) and b) obtain sufficient data density to be able to calculate the Upper Tolerance Limit (UTL).

As part of this investigation, 111 soil samples have been collected from soils onsite ranging from surface soils to approximately 30 ft bgs. The mean vanadium concentration of the data set was 20.12 mg/kg, and a standard deviation of 7.34 mg/kg.

Evaluating the data set further, there were three outlying values, coming from soils collected in AOC 7 – Fuel Storage Tanks. These samples were collected from surface soil sample locations SS0704 and SS0705 and are discussed further in Subsection 5.7 and are considered as impacted. Removing those from background calculation, the data fit a normal distribution. The 95% UPL for this data set was then calculated using ProUCL™ with a resulting concentration of 28.31 mg/kg.

In accordance with EPA guidance, the UTL provides an accepted statistical method for representing a background value for a set of data (EPA, 2002). The UTL represents a value that 95 percent of the population will fall below with 95 percent confidence. UTL values are intended to be used to evaluate Site data on a data point by data point basis; analytical results in Site media that exceed background UTL values are interpreted as exceeding background concentrations and may be identified as Site-related contamination.

UTL values were calculated using ProUCL v.5.1.002. The ProUCL software characterizes the statistical distribution of the data set for each analytical parameter and derives UTL values using algorithms applicable to each statistical distribution. As the vanadium data with outliers removed appear normally distributed, the UTL Statistic was calculated for a 95% UTL with 95% coverage using the algorithm for a normal distribution. The 95/95 UTL was equal to 29.64, which is suggested as the sitewide background criteria for vanadium. The calculations and outputs supporting this is provided in Appendix J.

Based on the sample set and the fact that no site practices used or would have released vanadium to soils, the 95/95 UTL value of 29 mg/kg has been used in this report for a site-specific background value and has been used to evaluate site soils in this SI report. This is also consistent with published vanadium concentrations in New England (and Vermont) soils.

Due to the deadline imposed by the MOU, we understand that the proposed vanadium value is being used in advance of VT DEC approval. However, we also believe that the vanadium in sitewide soils is naturally occurring and will not warrant additional evaluations or action. A formal request for approval of this value will be provided to VT ANR under separate cover.

5. Areas of Concern Investigations and Results

As noted above there are 17 AOCs that were investigated for potential impacts to the environment. Data have been compared to the RVSS and NRVSS for soils and the VT GES for groundwater, as promulgated on July 6, 2019, under the I-Rule. Total PCB concentrations have also been evaluated with respect to TSCA regulations. A summary of the analytical program is provided in Tables 4.0-2 and 4.0-3.

With the exception of AOC 17 – Groundwater, this section presents the background, completed investigation, results and CSM for each AOC as well as recommendations, as warranted. Groundwater is discussed in Section 6.

5.1 AOC 1 – 345 KV SWITCHYARD

The 345 kV Switchyard is located northwest of the main plant area. Specific PCSs associated with this AOC are:

PCS 1-1 Auto Transformer (within the 345 kV yard)
PCS 1-2 Former Spare Main Transformer (located outside the 345 kV yard)

Located within the 345 kV Switchyard is one Auto Transformer (T-4) (PCS 1-1) original to VYNPS. A second Auto Transformer was added by VELCO in 2010 and is located within the new VELCO substation. The transformers sit on concrete pads within the switchyards. The original T-4 auto transformer has a 17,200-gallon capacity of non-PCB oil. While staining is not currently observed in the vicinity of the transformer, a leak was previously noted in 2003 and reported to the VT DEC. Phase II soil sampling activities were performed by TRC, Inc. (TRC) in March 2009 on behalf of VELCO. Soil samples collected from the five dry wells contained total petroleum hydrocarbon (TPH) at concentrations above the Vermont Soil Reuse Criteria, but all PCBs were not detected above laboratory reporting limits (TRC, 2009).

The Former Spare Main Transformer (PCS 1-2) was located on an in-ground secondary containment that was designed to hold 120% of the volume of oil contained in the spare, de-energized transformer. The containment is filled with crushed trap rock and two layers of a 10 ounces per square yard (oz/yd^2) polypropylene geotextile filter material with a layer of well-compacted process gravel. The design allows for rainwater passage while preventing oil passage. Four 6-inch sumps were installed at the corners of the containment area to facilitate oil collection and removal in the event of a leak. The former Spare Main Transformer was located east of and outside of the switchyard along the eastern edge of the AOC and had a 26,500-gallon capacity of non-PCB oil. This transformer was removed from the Site in 2007. The containment area remains, and stained soils have been noted in the vicinity of the former transformer.

5.1.1 Previous Investigations

Following the reported oil leak from the Auto Transformer (PCS 1-1), Phase II soil sampling activities were performed by TRC in March 2009 on behalf of VELCO. Soil samples collected from the five dry wells contained TPH at concentrations above the Vermont Soil Reuse Criteria of 1,000 mg/kg. PCBs were not detected above laboratory reporting limits (TRC, 2009) and approximately 25 cubic yards of impacted soils were remediated by excavation.

5.1.2 Investigation Activities

Access to the switchyards was not provided by VELCO at the time of this investigation. Explorations (SS0101 and SS0102) located within the switchyard fence could not be sampled. Soil samples were collected from DP0101, located adjacent to the Former Spare Main Transformer (PCS 1-2) pad. Shallow (0-1 ft bgs) and deeper subsurface soil (18-20 ft bgs) samples were collected for COCs including VOCs, polynuclear aromatic hydrocarbons (PAH), PCBs, TPH, and target analyte list (TAL) metals. Exploration locations are shown on Figure 5.1-1 and analytical results are summarized on Figure 5.1-2 and on Table 5.1-1.

5.1.3 Findings

VOCs, PAHs, TPH and PCBs were not detected above laboratory reporting limits. 1,2,3 – tricholoropropane was reported as non-detect with and MDL above the RVSS in all samples collected during this field event. No other VOCs MDLs exceeded the RVSS at this AOC, and as noted in Section 4.3, it is highly unlikely that this PCS has been impacted by only 1,2,3 – tricholoropropane; the MDLs were reported at 0.0067U mg/kg and 0.0047U mg/kg as compared to the criteria of 0.00311 mg/kg.

Arsenic was detected in both samples at concentrations (3.9 and 4.0 mg/kg) below the established VT DEC rural background of 16 mg/kg. Concentrations of vanadium exceeded the RVSS criteria of 2.88 mg/kg in both samples (20.9 and 13.5 mg/kg) however; these concentrations appear to be within the Site background concentration as discussed in Section 4.5 and presented in Appendix J.

5.1.4 Conceptual Site Model

Releases from the Former Spare Main Transformer would have impacted adjacent surface soils and infiltrated soils to the groundwater table. Evidence of a release was not observed during screening of the subsurface soils or in either sample submitted for analysis.

5.1.5 Recommendations

No further action is recommended for PCS 1-2 however; if access to the substation can be arranged with VELCO, we recommend the collected of SS0101 and SS0102 to address PCS 1-1.

5.2 AOC 2 – 115 KV SWITCHYARD

The 115 kV Switchyard is located in the northern portion of the Site, north of the 345 kV Switchyard and east of the main parking lot. Specific PCSs associated with this AOC are:

PCS 2-1	99 kV Distributor Transformer
PCS 2-2	Keene Line Breaker
PCS 2-3	Bus Line Breaker
PCS 2-4	Coolidge Line Breaker

5.2.1 Investigation Activities

As noted above, access to the substations was not provided by VELCO during this investigation. NNDC will continue to work with VELCO to arrange access for sample collection. Exploration locations are shown on Figure 5.2-1.

5.3 AOC 3 – FORMER SOUTH WAREHOUSE

The Former South Warehouse was located at the southern boundary of the Protected Area. Specific PCSs associated with this AOC are:

PCS 3-1	Former Oil Storage
PCS 3-2	Former Battery Storage
PCS 3-3	Former 1,000-gallon Gasoline/Diesel UST
PCS 3-4	Former 550-gallon Diesel UST
PCS 3-5	1,000-gallon Diesel Aboveground Storage Tank (AST)
PCS 3-6	Former Waste Oil Burner
PCS 3-7	Former Vehicle Maintenance Area

The South Warehouse was used for materials storage onsite. Along the east end of the building, within a containment berm, virgin and waste oils were stored in 55-gallon drums (PCS 3-1). In the southwest corner of the building, and within a locked cage area, lead-acid batteries were stored and charged (PCS 3-2). Previously, this area was used for vehicle maintenance during plant construction (PCS 3-7).

Located northeast of the former South Warehouse is a portable diesel AST (and two former USTs). The portable 1,000-gallon Diesel AST (PCS 3-5) is stored in the vicinity of the former warehouse when not in use fueling Site vehicles. The Former 1,000-gallon Gasoline/Diesel UST (PCS 3-3) was a double-walled fiberglass tank used to fuel Site vehicles. The gasoline tank was installed in 1997 but was converted to diesel due to security restrictions following September 11, 2001. Adjacent to the 1,000-gallon UST was the former 550-gallon Diesel UST (PCS 3-4), which was also a double-walled fiberglass tank. Both tanks had automatic interstitial monitoring systems installed.

To the east of the USTs, in the Former Containment Access Building (CAB), there existed a Waste Oil burner and its associated AST (PCS 3-6). This tank has been drained, cleaned, and removed from the Site with no associated soil impacts or remedial actions. The former CAB has since been replaced with the current CAB. According to former Site personnel, USTs have all been removed in accordance with VT ANR regulations.

5.3.1 Investigation Activities

Four direct push explorations (DP0301 through DP0304) were advanced in areas where petroleum and chemicals were formerly stored and/or used at the South Warehouse. DP0301 was advanced in the area of the former diesel USTs (PCS 3-3 and 3-4); DP0302 was advanced in the area of the former waste oil UST (PCS 3-6); and DP0303 and DP0304 were advanced to evaluate soils beneath the warehouse slab (PCS 3-1, 3-2, 3-5 and 3-6). Surface and subsurface soil samples from these locations were collected and submitted some or all of the following COCs: VOCs, SVOCs, PAHs, PCBs, TPH, and TAL metals.

Exploration locations are shown on Figure 5.3-1 and analytical results are summarized on Figure 5.3-2 and Table 5.3-1

5.3.2 Findings

In the deeper soil sample, collected directly above the water table (18-20 ft bgs) in the vicinity of the former diesel USTs (DP0301), trace concentrations of benzene and acetone (common laboratory contaminant) were detected as well as diesel range organics (DRO) and gasoline range organics (GRO). In the surface soil collected in the former waste oil UST location (DP0302), trace concentrations of trichlorofluoromethane (CFC-11) and TPH (DRO) were detected. No VOCs, SVOCs, TPH or PCBs were reported in the deeper sample (20 to 22 ft bgs) at this location. Trace concentrations of VOCs (acetone and methylene chloride) were also reported in the deeper soil sample (18-20 ft bgs), collected along the west side of the former warehouse, to evaluate soils beneath the former building (DP0304).

Several SVOCs/PAHs were in the shallow soil (0-1 ft bgs) samples collected from the former warehouse operations area. The PAH benzo(a)pyrene was reported at a concentration above the RVSS (0.076 mg/kg) in the sample collected from DP0303 and its duplicate (0.125 and 0.228 mg/kg, respectively). These results also exceeded the Toxicity Equivalence Concentration (TEQ) for benzo(a)pyrene, as shown in the calculations in Appendix J.

Metal concentrations for this AOC were within site background concentrations. Arsenic was reported at concentrations below the established VT DEC rural background criteria of 16 mg/kg. Concentrations of vanadium exceeded the RVSS criteria of 2.88 mg/kg in all eight samples, ranging from 11.7 to 29.2 mg/kg however; these concentrations appear to be within the Site background concentration as discussed in Section 4.5 and presented in Appendix J.

5.3.3 Conceptual Site Model

Leaks or spills may have impacted soil and/or groundwater in the vicinity of the former diesel USTs and beneath the former warehouse slab through penetrations in the concrete. Based on the results a release likely occurred in the vicinity of the former USTs (DP0301) however; impacts appear to be minor as no staining, sheens or odors were observed during soil screening at all four boring locations and trace COCs were detected in the deeper soil samples. Results indicate that spills or leaks to the warehouse floor have impacted shallow soils.

5.3.4 Recommendations

Further evaluation of the former USTs is not recommended at this time however; we recommend additional screening of shallow soil beneath the concrete floor slab as it is demolished and removed. If evidence of a release is observed, samples should be collected and analyzed for the COCs as listed above; including the full suite of SVOCs.

5.4 AOC 4 – FORMER NORTH WAREHOUSE

The former North Warehouse was located in the northern section of the Protected Area. Specific PCSs associated with this AOC are:

PCS 4-1 Former 500-gallon Waste Oil AST

PCS 4-2 Former Oil Burner Unit and Exhaust
PCS 4-3 Former 550-gallon Diesel UST
PCS 4-4 Former Chemical Storage and Equipment Staging

The North Warehouse was constructed in the late 1960s and has been used to store both radioactive wastes and RCRA hazardous wastes. The building also housed an oil furnace used to burn used lubricant oil and fuel oils (PCS 4-1 and 4-2). Some of the documented wastes included spent lead-acid batteries, used ethylene glycol and small PCB-containing components. No PCB oils or liquids were stored in the building nor were PCB-containing oils burned in the furnace.

Adjacent to the warehouse to the south, the 550-gallon Diesel UST (PCS 4-3) was used to fuel the John Deere emergency generator. This tank was a double-walled fiberglass tank.

The warehouse was cleaned out in late 2015 in preparation for demolition, which occurred in 2016. The building materials were removed from Site as was the UST in accordance with UST Rules, §8-604 of the Underground Storage Tank Rules (Haley & Aldrich 2016a, 2016b).

5.4.1 Previous Investigations

During the 2001 Phase II investigation performed by ECS, two soil samples were collected in the vicinity of the 550-gallon diesel UST adjacent to the former North Warehouse. No VOCs were detected above MDLs in either sample, and TPH was detected in one sample at 34 mg/kg. Additionally, in support of the expansion of the ISFSI pad, ENVY characterized the building materials and soils below the North Warehouse and the John Deere Diesel Generator building. An additional investigation has been completed, with data indicating that no chemicals have been released to soils or to groundwater. A total of 18 samples were collected and submitted for laboratory analysis of VOCs, SVOCs, metals, pesticides, herbicides, PCBs and dioxins. All data either indicate naturally occurring materials (i.e. arsenic) or constituents detected at background levels (i.e. dioxins) (Haley & Aldrich, 2016a). VT ANR agreed with the conclusions by letter dated 9 May 2016. The final report was submitted in August 2017 (Haley & Aldrich 2017b).

The additional investigation consisted of surface and subsurface soil samples were collected from the North Warehouse footprint and floor drains within the North Warehouse. The 550-gallon diesel fuel oil UST, adjacent to the John Deere Diesel Generator Building was removed. A UST Closure Report was submitted to the VT ANR on 17 November 2016 and soil samples from the excavation were analyzed as a part of the additional investigation.

The following bullets summarize the soil characterization data:

- No soil sample analytical results exceeded regulatory criteria. This is consistent with the field observations that did not note any staining, odors or evidence suggesting a release.

- Very low concentrations of polychlorinated dibenzodioxins/polychlorinated dibenzofurans (PCDD/PCDF) were detected, but at concentrations that are lower than mean background soil concentrations and have congener profiles consistent with background soils.

- Very low concentrations of TPH (DROs) were detected in the samples collected from the UST excavation. These levels are indicative of developed properties and do not suggest a leak from the UST.

- Sediments deposited in the drainage pipes associated with the North Warehouse contained concentrations of VOCs (tetrachloroethene, 2-butanone and acetone) and PCB Aroclor 1254 below RVSSs. There was no indication of any leaks or releases of liquids from the piping to the soils, however if a release occurred the resulting impacts, based on these data, would also be below the RVSSs.

- Based on the absence of detectable concentrations of Site-related constituents, the data suggest that there have not been releases of chemical constituents associated with the North Warehouse or John Deere Diesel Generator Building and associated UST.

In conclusion the data show that the soils have not been impacted by Site operations. Arsenic detections exceed regulatory screening criteria; however, the detected concentrations are consistent with background concentrations in soil in New England and the Synthetic Precipitation Leaching Procedure (SPLP) analyses were all non-detect. The reported arsenic levels are all below the Draft Statewide Soil Report, "An Evaluation of PAHs, Arsenic, and Lead Background Soil Concentrations in Vermont" in which 16 mg/kg has been adopted as the statewide arsenic background threshold value (VT DEC 2016).

5.4.2 Investigation Activities

This AOC was closed out following the 2016 and 2017 investigations as discussed above. No additional investigation activities were warranted as part of this investigation.

5.5 AOC 5 – TURBINE BUILDING

The Turbine Building is located at the center of the Site within the Protected Area. Specific PCSs associated with this AOC are:

PCS 5-1	12,000-gallon Fuel Oil AST (outside of the turbine building)
PCS 5-2	Former 5,000-gallon Fuel Oil UST (removed from site/2008 SMAC Designation)
PCS 5-3	Associated Underground Fuel Oil Piping
PCS 5-4	Lube Oil Pump Room
PCS 5-5	Diesel Generator Rooms
PCS 5-6	Former Dry-Cleaning Operations
PCS 5-7	Machine Shop
PCS 5-8	Chemistry Laboratory
PCS 5-9	Interior Transformers

The 12,000-gallon Fuel Oil AST (PCS 5-1) is located adjacent to the Turbine Building along the western perimeter. This double-walled tank was installed in 1995 and is used to feed the House Heating Boiler. This tank replaced the Former 5,000-gallon Fuel Oil UST (PCS 5-2), which was removed in 1994. Due to previous leaks from the former UST, several fuel-related constituents impacted the groundwater quality, with Light Non-Aqueous Phase Liquid (LNAPL) removal and monitoring activities completed to satisfy VT DEC requirements and in 2008, VT ANR issued a SMAC designation, the groundwater monitoring wells

have been formerly closed. Although the UST was removed in 1994, the over 200 feet of underground fill piping (PCS 5-3) is still in place due to other plant components rendering it inaccessible.

The Lube Oil Pump Room (PCS 5-4) is located in the northwestern portion of the Turbine Building and houses an 11,000-gallon lube oil AST. In addition to the AST, the Lube Oil Pump Room was also used to store 55-gallon drums and 5-gallon buckets of new lube oil, as well as smaller containers of waste oil. All containers have been removed from this area and the AST has been drained as of 2015. No staining has been observed, and the floor has drains that connect to an oil/water separator. Currently, there is no oil remaining in the lube oil room, the tanks have been drained and only residual oil remains.

The Diesel Generator Rooms (PCS 5-5) are located in the southeastern portion of the Turbine Building and contain four aboveground oil tanks: two 800-gallon diesel fuel day tanks and two 275-gallon lube oil tanks for use with the diesel generators. As with the lube oil pump room, all tanks have been drained as of 2015, no staining has been observed, and the floors have drains that connect to oil/water separators.

In the truck bay located in the southwestern portion of the Turbine Building, Dry Cleaning Operations (PCS 5-6) were conducted in the early 1980s to clean protective clothing used in the Radiologically Controlled Area (RCA). Although these operations only lasted a few years, chlorinated solvents have been detected in groundwater during sampling events completed as part of the leaking UST (PCS 5-2) investigation.

Other areas of note in the Turbine Building include the southern section, which is used as a machine shop (PCS 5-7), the northeast area where the chemistry laboratory (PCS 5-8) is located, and six transformers (PCS 5-9) located throughout the building.

5.5.1 Investigation Activities

To characterize AOC 5, four direct push explorations (DP0501 through DP0504) were advanced in the area of the former and current fuel oil tanks and associated piping (PCS 5-1 through 5-3). Surface and subsurface soil samples were collected and analyzed for some or all of the following COCs: VOCs, PAHs, TPH, Per- and Polyfluoroalkyl Substances (PFAS) and TAL metals. Due to the previous indication of impacts to groundwater related to the dry-cleaning operations, direct push locations were extended into the water table and grab groundwater samples were collected. For PCSs that fall within existing structures, sub-floor characterization will be coordinated with the building demolition and may be conducted following floor slab removal.

Exploration locations are shown on Figure 5.5-1 and analytical results are summarized Figures 5.5-2 and 5.5-3 and on Table 5.5-1 and 5.5-2.

5.5.2 Findings

Trace concentrations of acetone (common laboratory contaminant) were reported in the deeper soil samples collected from DP0501 and DP0503. In the deeper sample collected directly above the groundwater table (18-20 ft bgs) in DP0502 (PCS 5-2, former 5,000-gallon UST) several VOCs and PAHs were detected. Concentrations of naphthalene and benzo(a)pyrene exceeded the RVSS. These results also exceeded the TEQ for benzo(a)pyrene, as shown in the calculations in Appendix J. DROs and GROs were also detected at significant concentrations. Additionally, a strong petroleum odor, staining and a sheen were noted on the boring log (Appendix D). Low concentrations of perfluorobutanoic acid (PFBA)

were detected in the shallow soil samples (0-1 ft bgs) collected from DP0502 and DP0504, but the total PFAS concentration did not exceed the RVSS. Analytical detection limits for three VOCs (dibromochloroprpane, ethylene dibromide, and vinyl chloride) exceeded soil criteria at location DP0502.

Grab groundwater samples were collected from all four direct push boring locations within this AOC. Samples were analyzed for the above listed COCs, with PFAS only analyzed in GW0502 and GW0504.

Several COCs (VOCs, PAHs, DRO/GRO) typically associated with fuel oil were detected in the grab groundwater samples GW0501 and GW0502 collected from DP0501 and DP0502, respectively. Concentrations of 1,2,4-Trimethylbenzene, 1,3,5-trimethylbenzene, and naphthalene exceeded VT GES in GW0502. Several PFAS were also detected in the groundwater at this location at concentrations above the VT GES. The calculations for reporting the sum of PFAS are provided in Appendix J.

No VOCs, PAHs or TPH (DRO/GRO) were detected above laboratory reporting limits in GW0503.

Low concentrations of chlorinated VOCs were detected in the grab groundwater sample GW0504, collected from DP0504 but at concentrations below the VT GES. Several PFAS were also detected in the groundwater at this location at concentrations exceeding the VT GES, and the total PFAS concentration exceeded the VT GES (Appendix J).

Elevated metals concentrations were detected in all four groundwater grab samples (GW0501 through GW0504) collected from this AOC. Concentrations of arsenic, chromium, lead, manganese, and nickel in some locations were also detected above the VT GES.

5.5.3 Conceptual Site Model

Results of the soil and groundwater sampling at this AOC demonstrate there are lingering impacts from the former UST leak (PCS 5-2 and PCS 5-3) as well as the former dry-cleaning operations (PCS 5-6). Trichloroethene (TCE) may be the results of past dry-cleaning or historic maintenance operations. The solvent may have been released to the ground through penetrations in the floor slab, leaks in the drainage system or releases to the ground outside the Maintenance Shop. Past potential sources have been removed from Site, and in the case of the leaking UST (PCS 5-2), it was previously investigated.

Impacts to Site groundwater from the former leaking UST and dry-cleaning or maintenance operations were likely limited due to the deep basement of the turbine building on the downgradient side of both PCS's. Neither chlorinated solvents nor VOCs typically associated with fuel oil (trimethylbenzenes, ethylbenzene, xylenes, etc.) were detected in downgradient monitoring wells.

Elevated metal concentrations in the grab groundwater samples were likely associated with suspended solids as the samples were very turbid.

5.5.4 Recommendations

Although concentrations of COCs exceeded VT GES in DP0502 (PCS 5-2), this boring was located adjacent to the Turbine Building and New Warehouse. It is likely the deep basement minimized the migration of COCs from the former leaking UST. Contamination may have extended beneath the adjacent New Warehouse (slab on grade). The New Warehouse is currently in use. To address this PCS, excavation

and off-site disposal of petroleum-impacted soils should be conducted during demolition activities. To support this, an additional boring will be proposed to verify the extent of impacted soils.

The former dry-cleaning operations occurred in the Turbine Building. Chlorinated solvents were only detected in the grab groundwater sample (GW0503) collected from DP0503. They were not detected in the groundwater elsewhere on Site nor were they detected in the soil from at this AOC. Perchloroethene, the VOC most typically associated with dry cleaning operations, was also not detected in the grab sample, suggesting that the TCE may also be related to maintenance activities.

To address the COCs that exceeded VT GES, additional monitoring wells are proposed to be installed and included in the Site Groundwater Monitoring Program. Groundwater should also be analyzed for 1,4-dioxine, a common stabilizer in degreasers used in maintenance activities.

5.6 AOC 6 – RADIOLOGICAL WASTE BUILDING AND TANKS

The Radiological Waste Building is located in the eastern portion of the Site, within the protected area, with the radiological waste tanks located to the east of the building. This building has been used for storage of radiological wastes being prepared for disposal off-site.

5.6.1 Investigation Activities

Soil samples were collected downgradient of AOC 6. Due to utilities and vehicle traffic, both direct push explorations proposed for this AOC had to be offset. Surface and subsurface soil samples were collected from DP0601 and DP0602 and submitted for analysis of VOCs, SVOCs, PCBs, and TAL metals. Both direct push borings were extended into the water table and groundwater grab samples were collected and analyzed for the same COCs. Additionally, downgradient and adjacent monitoring wells GZ-2S and GZ-6S were sampled as part of the Quarterly Groundwater Monitoring program.

Exploration and Monitoring Well locations are shown on Figure 5.6-1. Analytical results for soil and groundwater are summarized on Figures 5.6-2 and 5.6-3 and on Tables 5.6-1 and 5.6-2.

5.6.2 Findings

Trace concentrations of common laboratory contaminants (acetone, methyl ethyl ketone (MEK) and bis (2-ethylhexyl phthalate)) were detected in the soil at AOC 6, below RVSS. Concentrations of arsenic were below the establish VT DEC Rural Background value of 16 mg/kg in all four samples collected from DP0601 and DP0602. Concentrations of vanadium exceeded the RVSS, ranging from 17.5 to 19.5 mg/kg however; concentrations were below the background value for the Site as discussed in Section 4.4 above. PCBs were not detected above laboratory reporting limits.

Acetone was detected in the groundwater grab sample (GW0601) collected from DP0601 and acetone and MEK was detected in the groundwater grab sample (GW0602) collected from DP0602. Concentrations of several metals were elevated in both groundwater grab samples. Concentrations of arsenic, chromium, lead, manganese and nickel exceeded the VT GES in both samples.

No VOCs or SVOCs were detected in downgradient monitoring wells GZ-2S and GZ-6S. Manganese was detected at 32,500 micrograms per liter (ug/L) in the sample collected from GZ-2S, above the VT GES of 300 ug/L.

5.6.3 Conceptual Site Model

The explorations at this AOC were to determine if storage of radioactive waste materials leaked or spilled impacting soils or groundwater with non-radiological constituents. Based on analytical results of both soil and groundwater testing, it does not appear the stored materials (PCS 6-1) spilled or leaked non-radiological constituents to the soil or groundwater.

5.6.4 Recommendations

Continue to monitor the groundwater at GZ-2S and try to determine the source for elevated manganese detected in the groundwater at this location. Soil beneath the concrete pad located in the loading/unloading area should be screened for impacts during demolition activities.

5.7 AOC 7 – FUEL STORAGE TANKS

In addition to the USTs and ASTs associated with previously mentioned AOCs, the following tanks are included within this AOC as individual PCSs:

PCS 7-1	3,000-gallon Fuel Oil UST – Plant Support Building (PSB)
PCS 7-2	75,000-gallon Fuel Oil AST – Main Fuel Oil Storage Tank, historically for emergency generators, currently for all diesel burning equipment.
PCS 7-3	9,600-gallon Diesel AST – Station Blackout Generator
PCS 7-4	1,000-gallon Gasoline AST – Gate 1
PCS 7-5	Former 500-gallon Waste Oil AST – Former Containment Access Building
PCS 7-6	275-gallon Fuel Oil AST – Shipping and Receiving

5.7.1 Investigation Activities

To characterize PCS's located within AOC 7, surface and subsurface soil samples were collected and analyzed for COCs including one or more of the following: VOCs, PAHs, PCBs, TPH, and TAL metals. Two direct push borings (DP0701 and DP0702) were advanced in the area of the currently active PSB UST (PCS7-1); a surface soil sample (SS0701) was collected and two direct push borings (DP0703 and DP0704) were advanced in the area of the 75,000-gallon fuel oil AST (PCS 7-2); two surface soil samples (SS0702 and SS0703) were collected and one direct push boring (DP0705) was advanced in the area of the 9,600 gallon diesel AST used to fuel the blackout generator (PCS 7-3); three direct push borings (DP0706 through DP0708) were advanced it the area of the 1,000-gallon gasoline AST and associate fill line and dispenser (PCS 7-4); a surface soil sample (SS0704) was collected within the footprint of the former 500-gallon waste oil AST at the Former Containment Access Building (PCS 7-5);and SS0705 was collected from surficial soils near the fill pipe for the 275-gallon fuel oil AST at Shipping and Receiving (PCS 7-6).

Exploration locations are shown on Figure 5.7-1. Analytical results for soil are summarized on Figure 5.7-2 and on Table 5.7-1.

5.7.2 Findings

Trace concentrations of acetone (a common laboratory contaminant) were detected in all four of the soil samples collected from DP0701 and DP0702 located adjacent to the currently active UST at the PSB

(PCS 7-1). A trace concentration of benzene was also detected in the deeper soil sample (8-10 ft bgs) collected from DP0702. No PAHs, TPH, PCBs or other VOCs were detected above reporting limits for this PCS.

In soil samples collected from DP0704 and SS0701, located adjacent to the 75,000-gallong fuel oil AST (PCS 7-2), evidence of a release was observed. Several VOCs were detected at concentrations below the RVSS in the deeper soil samples collected at and just above the groundwater table (16 to 18 and 21 to 23 ft bgs) in DP0704. TPH (DRO) were also detected in the sample collected from 16 to 18 ft bgs. A diesel like odor and PID reading (49.7 ppm) were also noted on the boring log (Appendix D) at this location. Trace concentrations of several PAHs as well as TPH (GRO) were detected in the surface soil sample SS0701.

In the soil collected from explorations (SS0702, SS0703, and DP0705) around the 9,600-gallon diesel AST used to fuel the blackout generator (PCS 7-3), several PAHs were detected at concentrations below the RVSS. Additionally, TPH (DRO) was detected in the surface soil collected from SS0703. No VOCs were detected above laboratory reporting limits for this PCS.

Other than trace concentrations of acetone, no other VOCs, PAHs, or TPH were detected above laboratory reporting limits in the soil collected from DP0706, DP0707 and DP0708 adjacent to the 1,000-gallon gasoline AST (PCS 7-4) and associated piping and fuel dispensing area.

A surficial soil sample (SS0704) was collected within the footprint of the former waste oil AST at the former CAB (PCS 7-5). VOCs, PAHs, TPH and PCBs were not detected above laboratory detection limits.

Surface soil in an area, approximately 9 sq. ft. in size, appeared to be stained just west of the fill pipe for the 275-gallon fuel oil AST at the Shipping and Receiving building (PCS 7-6). A sample of the stained soil was collected (SS0705) as well as field duplicate for QA/QC purposes (SS0705DUP). Several VOCs were detected in both samples with concentration of ethylbenzene and naphthalene exceeding the RVSS. Several PAHs were also reported at concentrations below the RVSS and significant concentrations of TPH (GRO and DRO ranges) were also reported. Total metal concentrations were below the RVSS with the exception of vanadium. Concentrations of vanadium in both the original sample and field duplicate (46.9 and 45.8 mg/kg, respectively) exceeded the calculated Site background concentration of 28 mg/kg.

With the exception of PCS 7-6, total metal concentrations in soil samples collected within this AOC were below the RVSS with the exception of vanadium which was below the site-specific calculated background value of 28 mg/kg as discussed in Section 4.5.

5.7.3 Conceptual Site Model

Former and current fuel storage areas were investigated as part of this AOC as fuel oil may have leaked or have been spilled impacting Site soil and potentially groundwater quality due to infiltration. Evidence of a release(s) were not found at the PSB fuel oil UST (PCS 7-1); the 1,000-gallon gasoline AST and associated dispensing area (PCS 7-4); or in the area of the former waste oil AST that was located at the former Containment Access Building.

Some petroleum-related impacts were observed in both the surface soil and deeper soil, near the water table, at the 75,000-gallon fuel storage AST (PCS 7-2) indicating that a surficial spill and potential leak from the tank or underground piping. Although not immediately adjacent, groundwater collected from

nearby and downgradient monitoring wells (GZ-9A, GZ-15S, GZ-19S and GZ-19D) did not contain any fuel oil related constituents.

Slight impacts to soil were observed in the area of the 9,600-gallon diesel AST used to fuel the blackout generator (PCS). These impacts were observed in both the shallow soil and in deeper soil, just above the water table. The source of these impacts could be result of a spill or overfill during AST filling activities or due to previous Site operations in this area.

An area of surface soil appeared to be stained adjacent to the Shipping and Receiving building in the vicinity of the fuel oil AST fill pipe (PCS 7-6). It appears to be the result of an overfill or spill to the ground surface, impacting shallow soils.

5.7.4 Recommendations

There are currently several structures and an active paved access road surrounding the 75,000-gallon fuel oil AST (PCS 7-2). Drill rig access to this area for additional borings is limited. We recommend further delineation of this PCS once the tank is removed from service and surrounding structures are demolished.

Impacts to soil in the vicinity of the 9,600-gallon diesel fuel AST were below RVSS criteria. Based on the detection of PAHs in the sample collected just above the groundwater table, we recommend the installation and sampling of a monitoring well directly downgradient of this PCS to determine if groundwater quality has been impacted.

Impacted surface soil at the Shipping and Receiving Building contained several COCs that exceeded the RVSS. This area will be addressed through excavation and off-site disposal. Confirmatory soil samples will be collected from the bottom and sidewalls of the remedial excavation.

5.8 AOC 8 – TRANSFORMERS

In addition to the transformers associated with previously mentioned AOCs, the following are included within this AOC as individual PCSs:

PCS 8-1	Vernon Hydro Tie Transformer – West Cooling Tower
PCS 8-2	Construction Office Building Transformer
PCS 8-3	Administration Building Transformer
PCS 8-4	Plant Service Building Transformer
PCS 8-5	Cooling Towers East Transformer
PCS 8-6	Cooling Towers West Transformer
PCS 8-7	Main Transformer
PCS 8-8	Auxiliary Transformer
PCS 8-9	Start-Up Transformer T-3A
PCS 8-10	Start-Up Transformer T-3B

These transformers range in capacity from 210 gallons to 27,400 gallons. Although each of these transformers is currently listed as using non-PCB oil, samples collected from the cooling tower transformers (PCS 8-5 and PCS 8-6) contained PCBs in concentrations greater than 50 ppm (249 and 246 ppm, respectively). No staining has been noted in the areas around these transformers.

In 2014, Main Transformer (PCS 8-7) had a reported spill and fire. Due to the fire, transformer oil and fire-fighting foam were spread outside of the containment structure. The Auxiliary Transformer (PCS 8-8) previously incurred an explosion and fire, which involved oil spraying outside of the containment area. Both of these transformer containment areas are connected to the North Storm Drain system, which includes an oil/water separator, and drains to the North System Outfall, discussed below (PCS 14-1).

5.8.1 Investigation Activities

To fully characterize AOC 8, surface soil samples were collected at each PCS (PCS 8-1 through 8-11) and analyzed for COCs including some or all of the following: TPH, PAHs, and PCBs. In addition, due to the previous fires noted at the main and auxiliary transformers (PCS 8-7 and PCS 8-8, respectively), and the close proximity of Start-Up Transformer T-3A (PCS 8-9) soil samples were collected and analyzed for PFAS and dioxins and groundwater samples (GW0807 and GW0808) were collected and analyzed for PFAS. The calculations for reporting dioxins and PFAS are provided in Appendix J.

Exploration locations are shown on Figure 5.8-1 and analytical results are summarized Figures 5.8-2 and 5.8-3 and on Tables 5.8-1 and 5.8-2.

5.8.2 Findings

PCBs were not detected in any of the soil samples analyzed as part of this AOC. Trace concentrations of PAHs were detected in the field duplicate sample from PCS 8-1 (SS0801DUP), PCS 8-3 (SS0803), PCS 8-5 (SS0805), PCS 8-9 (SS0810) and PCS 8-10 (SS0811). The benzo(a)pyrene TEQ exceed the RVSS at SS0805 (Appendix J). TPH (DRO) was detected at a concentration slightly above laboratory reporting limits at the east cooling tower transformer (PCS 8-5). No dioxins/furans were detected in the soil collected from the Main, Auxiliary or Start-Up T-3A transformer areas (PCS 8-7 through PCS 8-9) and the TCDD TEQ did not exceed the RVSS (Appendix J). PFAS were detected at low concentrations in the surface soil collected adjacent to the Auxiliary (SS08008) and Start-Up T-3A transformers (SS0809), and the total PFAS concentration did not exceed the RVSS (Appendix J).

Dioxins/furans were not detected in the groundwater grab samples (GW0807 and GW0808) collected near the Main and Auxiliary transformers (PCS 8-7 and 8-8, respectively) and the TCDD TEQ did not exceed the VT GES (Appendix J). Several PFAS were detected in the groundwater at both locations. The concentration of Perfluoroheptanoic acid (PFHpA) (0.141 ug/L) exceeded the VT GES of 0.02 ug/L in the sample collected from the groundwater at the Main transformer (GW0807). In addition, the total PFAS concentrations in the samples collected from locations GW0807 and GW0808 exceeded the VT GES (Appendix J).

5.8.3 Conceptual Site Model

Based on surface soil sample results, it does not appear there were any significant releases, impacting surrounding surface soil at current and former transformer locations (PCS 8-1 through PCS 8-10).

Although there have been reported spills and a previous fire at the Main and Auxiliary transformer (PCS 8-7 and 8-8, respectively), PFAS only exceeded the VT GES in the groundwater at PCS 8-7.

5.8.4 Recommendations

Install a monitoring well at the Main transformer and continue to monitor groundwater for PFAS this location.

5.9 AOC 9 – INTAKE AND DISCHARGE SYSTEMS

As part of the intake and discharge operations, hydraulic gates were installed and used to control flow. Each of these systems included a 210-gallon sump tank containing hydraulic oil (PCS 9-1 and PCS 9-2). Both of these systems have been removed from service and oil has been drained from the 210-gallon reservoirs.

In addition to the hydraulic systems, there is a 350-gallon Diesel AST (PCS 9-3) located within the intake structure that fuels the fire pump within the building.

5.9.1 Investigation Activities

Due to the enclosed hydraulic systems and their locations, no sampling was proposed for this AOC as part of this phase of investigation. Soil samples should be collected from the area surrounding the diesel AST following removal/demolition activities.

5.10 AOC 10 – PARKING LOTS

There are three general parking areas located onsite, which make up this AOC, as well as some small storage buildings located within the parking lots. The specific PCSs include:

PCS 10-1	Main Parking Lot
PCS 10-2	Plant Support Building Parking Lot
PCS 10-3	Overflow Parking Lot
PCS 10-4	Salt Storage and “Dog Pound” Outbuildings

Both the Main Parking Lot and the PSB Parking Lot are paved areas, while the Overflow Parking Lot is a gravel area. The salt storage and “dog pound” structures are wooden storage buildings currently used for salt and miscellaneous material staging, including herbicide application equipment. Previously these buildings were used as dog kennels.

5.10.1 Investigation Activities

Surface and subsurface soil samples from direct push boring locations DP1011 through DP1013 at PCS 10-4. Shallow soil samples collected from 0 to 1 ft bgs and 1 to 2 ft bgs were submitted from each exploration for analysis of herbicides and pesticides. Additional soil screening and sampling is proposed for the other PCS’s at a later date.

A groundwater sample was collected from GZ-8S located downgradient of the Main Parking Lot (PCS 10-1) and submitted for analysis of VOCs, PAHs, TPH, and total TAL metals.

Exploration locations are shown on Figure 5.10-1 and on Table 5.10-1 and 5.10-2.

5.10.2 Findings

Herbicides were not detected above laboratory reporting limits in any of the samples collected from PCS 10-4. Pesticides 4,4'-DDE and 4,4'-DDT were detected at concentrations below the residential USEPA RSL in the two soil samples collected from DP1013 located adjacent to the east (downgradient) side of the "dog pound". No herbicides or pesticides were detected above laboratory reporting limits in any of the groundwater grab samples collected at the AOC.

In the groundwater collected from GZ-8, located downgradient of the Main Parking Lot (PCS 10-1), no VOCs, PAHs or TPH were detected above laboratory reporting limits. Concentrations of total metals were below the VT GES.

5.10.3 Conceptual Site Model

The presence of DDT and DDE in the shallow soil at DP1013 is likely associated with historical applications of pesticides and not a recent release. DDT was banned in the United States in 1972. DDE is a breakdown product of DDT. These compounds stick strongly to soil and are not likely to infiltrate to the groundwater.

Releases of COC in the Main Parking Lot have not impacted groundwater quality in that PCS.

5.10.4 Recommendations

The completion of other proposed soil screening and sampling at the time of demolition/pavement removal to evaluate subsurface soil conditions in the Main Parking Lot (PCS 10-1) the PSB Parking Lot (PCS 10-2) and the Overflow Parking Lot (PCS 10-3).

5.11 AOC 11 – HAZARDOUS MATERIALS STORAGE

In addition to the South and North Warehouses (AOCs 3 and 4, respectively), hazardous materials were also stored within the following PCSs:

PCS 11-1 Hazardous Materials Short-Term Storage-Area
PCS 11-2 Hazardous and Universal Waste Short-Term Storage Area – Former Location
PCS 11-3 Hazardous and Universal Waste Short-Term Storage Area – Current Location

The former Hazardous Materials Short-Term Storage Structure is currently located north of the Former South Warehouse and currently houses virgin oil that is in use. This structure has steel walls and a steel floor. The Hazardous and Universal Waste Short-Term Storage Structure, formerly located east of the 345 kV Switchyard (AOC 1), is now located at the shipping and receiving warehouse near the main plant entrance and is the main short-term storage facility for universal and hazardous wastes outside of the Protected Area. The Protected Area short-term hazardous and universal waste storage area is located in the warehouse, adjacent to the tool and crib. Both short-term storage areas can contain wastes, including spent solvents, oily rags, and other corrosive, reactive, toxic, or specific listed wastes and universal waste in advance of shipment for disposal.

5.11.1 Investigation Activities

Three direct push borings were drilled to evaluate this AOC. DP1101 was advanced in the hazardous materials short-term storage area (PCS 11-1); DP1102 was advanced in the current hazardous and universal waste short-term storage area (PCS 11-3); and DP1103 was advanced in the former hazardous and universal waste short-term area (PCS 11-2). Surface and subsurface soil samples were collected and submitted for analysis of COCs including VOCs, SVOCs, PCBs, TPH, and TAL metals.

Groundwater samples were collected from monitoring wells GZ-19S and GZ-19D, located downgradient of PCS 11-1; and monitoring well 1101 located at PCS 11-2. Samples were submitted for analysis of VOCs, PAHs, TPH, and TAL metals. The sample collected from 1101 was additionally analyzed for PCBs, based on its downgradient location of the 345-kV switchyard.

Exploration locations are shown on Figure 5.11-1 and analytical results are summarized Figures 5.11-2 and 6-6 and on Tables 5.11-1 and 6-3. Groundwater data from the monitoring well network are presented in Section 6.0.

5.11.2 Findings

With the exception of trace concentrations of the common laboratory contaminants acetone, MEK and bis(2-ethylhexyl)phthalate, no VOCs, SVOCs, or PCBs were detected above laboratory reporting limits for this AOC. TPH (DRO) was detected at a low concentration (32.8 mg/kg) in the deeper sample (5 to 7 ft bgs) collected from DP1101. Concentrations of total metals were below the RVSS with the exception of vanadium. Concentrations of vanadium were below the established Site background value of 28 mg/kg with the exception of the surface soil sample (0 to 1 ft bgs) collected from DP1103, where it was detected at 28.7 mg/kg.

With the exception of a trace concentration of naphthalene (0.49 ug/L) detected in the groundwater at GZ-19S, no VOCs, PAHs or TPH were detected at concentrations above the laboratory reporting limits in the wells sampled as part of this AOC. Additionally, PCBs were not detected in the groundwater collected from monitoring well 1101. Total metal concentrations were below the VT GES with the exception of manganese in GZ-19D.

5.11.3 Conceptual Site Model

Hazardous materials are/were stored at three locations evaluated as part of this AOC. Based on both soil and groundwater results, it does not appear that materials in storage leaked or were spilled, impacting underlying soils or infiltrating to the groundwater table. Although the concentration of manganese exceeded the VT GES, elevated concentrations of manganese was detected in the groundwater across most of the Site and not a COC associated with the storage of hazardous materials.

5.11.4 Recommendations

No additional investigation at the PCS's within this AOC is recommended. Groundwater quality monitoring will continue as part of the Site Groundwater Monitoring Plan.

5.12 AOC 12 – FORMER EDSON'S GULF STATION AND GARAGE

The former Edson's Gulf Station and Garage (AOC 12), located at 306 Governor Hunt Road, was used as a gasoline filing and automobile repair facility. The specific PCSs associated with these operations are:

PCS 12-1 Two Former Gasoline USTs
PCS 12-2 Floor Drain in the garage bay
PCS 12-3 Former Dry Well
PCS 12-4 Former in-ground hydraulic lift
PCS 12-5 275-gallon Fuel Oil AST

The former gasoline USTs (PCS 12-1) were reportedly removed from the property in 1990 and were found to be leaking. The site was investigated and remediated and was listed by VT DEC as SMS Site No. 93-1485, with a SMAC designation in 2009. In addition to the former USTs, there was a floor drain (PCS 12-2) that reportedly drained to a dry well (PCS 12-3) on the north side of the building. An in-ground hydraulic lift (PCS 12-4) was also present in the garage. The upper components of the lift were removed however; the in-ground cylinder was left in place when the pit was sealed with concrete. In October 2007, a Phase I ESA of this property was completed by ECS. They identified the PCSs listed above as RECs.

In 2015, limited investigations were performed on the floor drains and sink drain by DB Environmental Consulting. Results of soil samples collected from floor drains contained concentrations of TPH and lead exceeded Industrial Soil Standards. The dry well was excavated, and no staining was observed, soil samples were not collected.

The garage is currently used by the VYNPS Maintenance Department for maintenance and storage of equipment. A 275-gallon AST (PCS 12-5), located within the southeast corner of the building, contains fuel oil for space heating. Additionally, this area is also used to collect waste oil for off-site disposal.

5.12.1 Investigation Activities

Five direct push boring locations were drilled at this AOC. DP1201, DP1202, DP1205 and DP1206 were advanced in the area of the former gasoline USTs and associated dispensers (PCS 12-1); DP1203 and DP1204 were advanced it the area of the former dry well (PCS 12-3) and DP1209 was advanced downgradient of the former gas station operations. Grab groundwater samples were collected at DP1201, DP1202 and DP1209. Surface, subsurface and grab groundwater samples were collected and submitted for analysis of some or all of the following COCs: VOCs, SVOCs, PCBs, TPH, and TAL metals.

Exploration locations are shown on Figure 5.12-1 and analytical results are summarized Figures 5.12-2 and 5.12-3 and on Table 5.12-1 and 5.12-2.

5.12.2 Findings

In the area of the former gasoline USTs (PCS 12-1), with the exception of acetone (common laboratory contaminant), no VOCs were detected above laboratory reporting limits. Several PAHs were detected at concentrations below the RVSS in the surface soil collected from DP1201 and DP1205, as well as TPH (DRO) in the surface sample from DP1205. However, the benzo(a)pyrene TEQ concentration at DP1205 (1 – 1.5 ft) exceeded the RVSS. Total metal concentrations were below the RVSS with the exception of

vanadium, which was below the calculated background value of 28 mg/kg for the Site, and manganese which exceeded the RVSS but was below the NRVSS in the surface soil sample collected at DP1206.

No VOCs or TPH were detected above laboratory reporting limits in the grab groundwater samples collected from DP1201 and DP1202, located downgradient of the former UST graves. Trace concentrations of the SVOCs diethyl phthalate and fluorene were detected in the water collected from DP1202. Concentrations of several metals exceeded the VT GES however; these elevated concentrations were likely associated with suspended solids as the grab groundwater samples were very turbid.

In the area of the former dry well (PCS 12-2), with the exception of acetone (common laboratory contaminant), no VOCs, TPH or PCBs were detected above laboratory reporting limits. Several PAHs were detected at low concentrations in the 13 to 14 ft bgs sample collected from DP1203. Vanadium was detected at concentrations above the RVSS but below the calculated background value for the Site. The concentration of manganese exceeded the RVSS in the deeper soil sample (16 to 18 ft bgs) collected at DP1203; however, it was below the NRVSS.

In the soil collected from DP1209, located downgradient of the former gas station operations, other than acetone (common laboratory contaminant), no VOCs, SVOCs, TPH or PCBs were detected above laboratory reporting limits. The concentration of manganese detected in the deeper sample (18 to 20 ft bgs) exceeded the RVSS however; the concentration is below the propose NRVSS. Vanadium was detected above the RVSS however; concentrations were below the calculated Site background value of 28 mg/kg. No VOCs, TPH or PCBs were detected in the groundwater grab sample from this location. Several PAHs were detected at concentrations below the VT GES. The concentration of total manganese exceeded the VT GES however; the elevated concentration is likely associated with suspended solids in the groundwater as the grab samples were very turbid.

5.12.3 Conceptual Site Model

The former gasoline USTs (PCS 12-1) were found to be leaking when they were removed from Site in 1990. Investigation and remediation activities were completed in 2009. Based on the recent results for both soil and groundwater, it appears the remedial actions were sufficient. Surficial soil along the northern end of the former USTs location is impacted with low levels of PAHs which may be the result of COCs being released to the ground surface from vehicle/equipment washing, fueling or maintenance.

Several PAHs were detected at low concentrations in the soil collected at the groundwater table (13 to 14 ft bgs) in the area of the former dry well (PCS 12-3). These compounds may be associated with COCs being released to the well via the floor drain in the garage.

Based on the results of soil and groundwater testing downgradient of the former gas station, it does not appear that any releases associated with the former facility operations have significantly impacted subsurface soils and/or infiltrated to the water table impacting site groundwater quality.

5.12.4 Recommendations

Other than the benzo(a)pyrene TEQ concentration at DP1205 (1 – 1.5 ft), no COCs were reported at concentrations exceeding the RVSS for PCSs 12-1 and PCS 12-3. No further investigation is recommended for these PCSs.

Further evaluation of PCSs 12-2, 12-4 and 12-5 is recommended the time of building demolition.

5.13 AOC 13 – SEPTIC SYSTEMS AND APPLICATION AREAS

According to the HSA, there were seven septic systems on-site but during the HSA, the authors mistakenly counted one system (COB and associated overflow) as two separate systems. There are only six systems which include the main septic system, New Warehouse, COB and associated overflow, Gatehouse 1, PSB, the former Power Uprate Building and Governor Hunt House. Of these septic systems, the following have been identified as PCSs based on handling or storage of chemicals that may have potentially been released to the environment through floor drains and/or sinks:

PCS 13-1 Main Septic System
PCS 13-2 New Warehouse
PCS 13-3 Construction Office Building and associated Overflow

Treated septage sludge and cooling tower silt were to be spread on two areas, the South Application Field (approximately 2 acres) and North Application Field (approximately 8 acres). Only the South Application Field was used for this purpose however; during the 2001 Phase I and II ESA half buried drums and debris were observed in the North Application Field area. Releases to both areas may have occurred through septage applications (South Application Field) or improper waste disposal (North Application Field). The following have been identified as PCSs based on this information:

PCS 13-4 South Application Field
PCS 13-5 North Application Field

Monitoring wells are installed in each of the leach fields and monitored semiannually. Results have been in compliance with VT ANR Groundwater Protection Rules.

5.13.1 Investigation Activities

To characterize AOC 13, the following explorations and groundwater sampling were conducted at each PCS as follows:

- DP1301 and DP1302 were advanced in the area of the Main septic system and leach fields (PCS 13-1) to evaluate potential impacts to soil and groundwater was collected from downgradient monitoring wells 1303 and 1303R to evaluate potential impacts to groundwater quality;
- DP1303 was advanced adjacent to the New Warehouse septic system (PCS 13-2) to evaluate impacts to soil and groundwater was collected from downgradient monitoring well 3401 to evaluate potential impacts to groundwater quality;
- DP1304 was advanced adjacent to the former leach field and septic system that serviced the COB (PCS 13-3) to evaluate potential impacts to soil and groundwater was collected from downgradient monitoring well 3301 to evaluate potential impacts to groundwater quality;
- DP1305 was advanced adjacent to the former COB overflow septic tank and leach field area (PCS 13-3) to evaluate potential impacts to soil;
- DP1306 through DP1308 were advanced in the area around the South Application Field (PCS 13-4) to evaluate potential impacts to soil. Groundwater grab samples (GW1306 through GW1308)

were collected from the direct push boring locations as well as monitoring wells 202, 203 and 204 to evaluate potential impacts to groundwater quality at this PCS; and,

- DP1309 through DP1311 were advanced in the area of the North Application Field (PCS 13-5) to evaluate potential impacts to soil. Groundwater grab samples (GW1309 through GW1311) were collected from DP1309 through DP1311 and a groundwater sample was also collected from down/cross gradient monitoring well 101 to evaluate potential impacts to groundwater quality. Additionally, two soil samples (SP1301 and SP1302) were collected from stockpiles in this area to characterize soil for off-site disposal or potential beneficial reuse on site.

Surface soil, subsurface soil and groundwater samples from this AOC were collected and submitted for some or all of the following analyses: VOCs, SVOCs, PCBs, TPH, and TAL metals.

Exploration locations are shown on Figure 5.13-1 and analytical results are summarized Figures 5.13-2 and 5.13-3 and on Table 5.13-1 and 5.13-2.

5.13.2 Findings

Trace concentrations of acetone (common laboratory contaminant) were detected in all four soil samples collected from the Main septic area (PCS 13-1). Methylene chloride and toluene were detected at concentrations below the RVSS in the sample collected at the water table (12-14 ft bgs) in DP1302. SVOCs and TPH were not detected above laboratory reporting limits. Metal concentrations were below the RVSS or site background values with the exception of vanadium in the surface soil (0 to 1 ft bgs) at DP1302. Vanadium was reported at a concentration of 33 mg/kg, above the Site background value of 28 mg/kg. No VOCs, SVOCs, TPH, or PCBs were detected in the groundwater at this PCS. Total metal concentrations were all below the VT GES.

In the area of the New Warehouse (PCS 13-2), trace concentrations of acetone (common laboratory contaminant) and MEK were detected in the surface soil. No SVOCs, TPH or PCBs were detected above laboratory reporting limits. Metal concentrations were all below the RVSS or Site background values. No VOCs or PAHs were detected in the groundwater from 3401 and total metal concentrations were below the VT GES.

At the COB septic system (PCS 13-3), with the exception of acetone, no VOCs, SVOCs, TPH or PCBs were detected above laboratory reporting limits in the soil. Concentrations of metals were below the RVSS or Site background values. No VOCs or PAHs were detected in the groundwater collected from 3301 however; concentrations of arsenic and manganese exceeded the VT GES.

In the area of the COB Overflow septic system (PCS 13-3), with the exception of trace concentrations of acetone, no VOCs, SVOCs, TPH or PCBs were detected above laboratory reporting limits in the soil. Concentrations of metals were below the RVSS or Site background values.

At the South Application Field (PCS 13-4), with the exception of acetone at trace concentrations, no VOCs, TPH or PCBs were detected in the soil at this PCS. Several PAHs, at concentrations below the RVSS were detected in the surface soils (0 to 1 ft bgs) at DP1307 and DP1308. However, the benzo(a)pyrene TEQ concentration at DP1308 (1 – 1 ft) exceeded the RVSS. With the exception of acetone, no VOCs or TPH were detected in the groundwater. SVOCs ((bis(2-Ethylhexyl)phthalate, diethyl phthalate, and di-n-butylphthalate)) were detected in the groundwater grab sample (GW1307) collected from DP1307 and (diethyl phthalate) was detected in the groundwater grab sample (GW1308) collected from DP1308 at

concentrations below the VT GES. Total metal concentrations exceeded the VT GES for several compounds in the grab samples. The elevated concentrations are likely associated with the suspended solids as these samples were very turbid. No VOCs or PAHs were reported in the groundwater collected from permanent monitoring wells in this PCS. The only total metal concentration that exceeded the VT GES, was manganese in the sample collected from 202.

In the North Application Field (PCS 13-5), with the exception of acetone, no VOCs, SVOCs, or TPH were detected above laboratory reporting limits. Concentrations of total metals were below the RVSS or Site background values for all metals with exception of manganese in the deeper soil sample (8 to 10 ft bgs) from DP1310, and vanadium in the shallow soil sample (0 to 1 ft bgs) collected from DP1311. The concentration of manganese (1470 mg/kg) exceeded the RVSS (300 mg/kg) however; it was below the NRVSS (11,350 mg/kg). The concentration of vanadium (29.4 mg/kg) slightly exceeded the Site background value of 28 mg/kg. No VOCs or TPH were detected in the groundwater grab samples collected at this PCS however; low concentrations of several SVOCs (diethyl phthalate, dimethyl phthalate, and phenanthrene) were detected. The total concentrations of several metals exceeded the VT GES however; the elevated metal concentrations are likely associated with the suspended solids in the turbid grab samples. In the groundwater sample collected using low flow techniques from monitoring well 101, no VOCs or PAHs were detected, and total metal concentrations were all below the VT GES.

With the exception of acetone, no VOCs, TPH or PCBs were detected in the soil samples (SP1301 and SP1302) collected from the stockpiles. Several PAHs were detected a low levels however; the concentrations of benzo(a)pyrene in both samples (0.106 and 0.285 mg/kg, respectively) exceeded the RVSS (0.07 mg/kg) but were below the NRVSS (1.54 mg/kg). Total metal concentrations were below the RVSS or Site background values with the exception of vanadium (35.4 mg/kg) detected in SP1302.

5.13.3 Conceptual Site Model

Potential impacts to Site soil and groundwater quality due to potential releases of COCs to facility floor drains, sinks, etc. were evaluated at PCSs 13-1 though PCS 13-3 as part of this AOC. Based on the data, no significant impacts have occurred.

The South Application Field (PCS 13-4) was evaluated for potential impacts to soil and groundwater as a result of the permitted treatment and land application of septic residuals. Low concentrations of SVOCs were detected in the shallow soil and in the groundwater grab samples. Additionally, some metal concentrations exceeded the VT GES, indicating potential impacts however; only manganese was detected at a concentration exceeding the VT GES in one of the three permanent monitoring wells (202, 203 and 204) sampled in this PCS.

Although the North Application Field (PCS 13-5) was never use for treated septic residual applications, previous reports identified half buried drums and debris in this area. Soils and groundwater in this PCS were evaluated to determine if there were any impacts from improper disposal of wastes. Although there were no significant impacts to soil in this PCS, some low concentrations of SVOCs were detected in the groundwater grab samples. Metal concentrations also exceeded the VT GES for several compounds. Based on the groundwater results from the permanent well (101) located down/cross gradient, the elevated metal concentrations are likely associated with suspended solids and not the result of a release.

Stockpiled soil in the North Application Field area was characterized for potential beneficial reuse on-site and/or off-site disposal. Stockpiled soil contained the PAH benzo(a)pyrene and vanadium at concentrations that exceeded the RVSS.

5.13.4 Recommendations

No further investigation is recommended for PCSs 13-1 through 13-3. Monitoring wells located downgradient of PCS 13-1 are included in the Groundwater Monitoring Program. No significant impacts were observed at PCSs 13-2, 13-3, 13-4 and 13-5. These systems have been taken out of service and are not expected to receive any additional wastewater from facility floor drains, sinks or bathrooms.

In the South Application Field (PCS 13-4), all COCs were detected below the RVSS in soil with the exception of the benzo(a)pyrene TEQ concentration at DP1308 (1 – 1 ft). Concentrations of metals exceeded the VT GES in the grab samples collected from the direct push locations but only the concentration of manganese exceed the VT GES in the samples collected from the three permanent monitoring wells (202, 203 and 204) in this PCS. Continued monitoring of these wells as part of the Groundwater Monitoring Plan is recommended. Due to the detection of several SVOCs at low concentrations in both the surface soil and grab groundwater samples, samples from these wells will be analyzed for the full suite of SVOCs during the next monitoring event.

In North Application Field area (PCS 13-5), no significant impacts to soil or groundwater were observed; no further investigation is recommended at this time. The removal and off-site disposal of the stockpiled soil and debris is recommended. Once the soil piles are removed, surface soil beneath the piles will be sampled for PAH to ensure soil containing concentrations of benzo(a)pyrene above the RVSS has been removed.

5.14 AOC 14 – STORM WATER OUTFALLS

There are six main storm water outfalls located onsite, all of which drain to the Connecticut River. These areas are:

PCS 14-1	North System Outfall
PCS 14-2	South System Outfall
PCS 14-3	Southeast System Outfall
PCS 14-4	345 kV Switchyard Outfall
PCS 14-5	115 kV Switchyard Outfall
PCS 14-6	Combined VELCO/VY Outfall

The North System Outfall (PCS 14-1) contains storm water from both inside and outside of the Protected Area. The outfall is located east of the plant stack and north of the intake structure. PCBs have been previously detected within the oil/water separator in this system, as well as the storm water flow in concentrations nearing 50 ppm, with the possible source being the Main Transformer containment vault (PCS 8-7).

The South System Outfall (PCS 14-2) contains storm water from both inside and outside of the Protected Area. The outfall is located within the Cooling Water Discharge structure. This system includes receiving water from within the containment sump of the 75,000-gallon Main Fuel Oil AST (PCS 7-2), although no previous issues have been noted for that area. There was a previous report of lube oil being pumped

from the Turbine Building, which ultimately drained through this system and outfall. There was also a previous report (RSCS, 2014) of an overflow at the Condensate Storage Tank of approximately 83,000 gallons which drained to the river through this system.

The Southeast System Outfall (PCS 14-3) consists of one catch basin which drains south of the East Cooling Tower. The 345 kV Switchyard Outfall (PCS 14-4) receives storm water runoff from the curtain drain surrounding the switchyard and drains north of the North System Outfall. The 115 kV Switchyard Outfall (PCS 14-5) receives storm water runoff from the curtain drain surrounding the switchyard and drains to the outfall north of the 345 kV Switchyard Outfall, and the combined VELCO/VY outfall (PCS 14-6) receives storm water runoff collected from the VELCO switchyard area and Site overflow parking areas and fields north and west of the VELCO substation. There are separate outfalls for VELCO and the Site that comingle upstream of the outfall to the River. This outfall is located north of the other outfalls, adjacent to the North Field Application Area.

5.14.1 Investigation Activities

Sediment samples were collected at each accessible outfall (PCSs 14-1, 14-2, 14-5 and 14-6). Samples were submitted for analysis of the following COCs: VOCs, SVOCs, PCBs, dioxins, TPH, pesticides, herbicides, and TAL metals.

Outfall sediment sample locations are shown on Figure 5.14-1 and results are summarized on Figure 5.14-2 and Table 5.14-1.

5.14.2 Findings

Sediment data have been compared both the RVSS as well as the Recommended Sediment Quality Guidelines for the protection of Aquatic Biota in Freshwater Ecosystems (VT ANR, 2019). With the exception of acetone, no VOCs, PCBs, herbicides or pesticides were detected above laboratory reporting limits in any of the four sediment samples collected. Low concentrations of TPH (GRO) and several PAHs were reported in the sample (SD140100) collected from SD1401 (PCS 14-1). TPH and PAHs were not detected at any other location. In the sample (SD140400) collected from SD1404 (PCS14-4), the concentration of cadmium (1.8 mg/kg), copper (60.4 mg/kg), nickel (36.4 mg/kg), and zinc (391 mg/kg) exceeded the TEC however; both were below the PEC for sediment as well as the RVSS. The concentration of zinc (292 mg/kg) reported in the sample (SD140500) collected from SD1045 (PCS 14-5) also exceeded TEC but was below the PEC and RVSS. Concentrations of vanadium in all four samples were above the VSS however; were below the calculated Site background value. Low concentrations of several dioxins/furans were reported in each sample, but the TCDD TEQs did not exceed the RVSS.

5.14.3 Conceptual Site Model

Although the site has a long history of being in compliance for the past National Pollutant Discharge Elimination System (NPDES) reports sediment samples were collected from the accessible outfalls SD1401, SD1404, SD1405 and SD1406. No significant impacts were observed in the sediment at any of these outfalls. Low concentrations of petroleum-related constituents were detected in the sediment from the North System Outfall (PCS 14-1). This outfall receives storm water from paved areas within and outside the Protected Area. Any petroleum releases to the pavement within these areas may have been mobilized via storm water. Elevated metal concentrations were observed in the sediment at the 345-kV Switchyard Outfall (PCS 14-4). This outfall receives storm water runoff from the switchyard. The

elevated concentrations of cadmium, copper, nickel and zinc may be potentially associated with the fill and/or operations in this area.

5.14.4 Recommendations

Sediment data is generally evaluated by conducting a Screening Level Ecological Risk Assessment. A risk assessment will be conducted after we have collected four quarters of groundwater samples so that impacts to surface waters may also be addressed. Once developed, the Risk Assessment will be submitted under separate cover and will supplemented the results of this investigation and support remedial objectives and proposed activities. Further evaluation of dioxins/furans and metals will also be conducted to determine if they are site-related or typical of the river sediments.

5.15 AOC 15 – COOLING TOWER AREA

Three PCS were identified in the cooling tower area:

PCS 15-1 [Reported] Creosote-Coated Timber Supports
PCS 15-2 Cooling Tower Sediment Storage Area ("Area B2")
PCS 15-3 Laydown Area (Southeast of Cooling Towers)

It was previously reported that the towers were constructed on timber supports that were coated with creosote. Upon further discussion with Site personnel that were there at the time of the tower construction, this is not true. The towers are reportedly supported by concrete. Explorations were still performed downgradient of PCS 15-1 however; we no longer suspect that creosote constituents are of concern.

An area located between the cooling towers ("Area B2") was used for temporary storage of sediment collected from the cooling towers. Some limited soil sampling was performed in Area B2 during the 2001 Phase II. No VOCs or TPH were detected above MDLs. Metal concentrations were within typical background ranges (ECS, 2001). During the recent Phase I site visit, an area located southeast of the cooling towers is being used as a "laydown" area. Piles of solid waste, including asphalt, concrete, soil, scrap wood and brush were observed (Normandeau, 2017).

5.15.1 Investigation Activities

To characterize AOC 15, eight direct push borings (DP1501 through DP1508) were advanced in this area. Soil samples were collected from DP1501, DP1502, DP1503, and DP1504 adjacent to the cooling tower foundations (PCS 15-1); from DP1505 and DP1506 in the former cooling tower sediment storage area "Area B2" (PCS 15-2); and from DP1507 and DP1508 in the stockpiled soil and laydown areas (PCS 15-3). Grab groundwater samples were collected from each direct push boring location. Samples in PCS 15-1 and 15-2 were collected for COCs including VOCs, PAHs and TAL metals. Soil and grab groundwater samples in PCS 15-3 were collected for VOCs, SVOCs, PCBs, TPH, Herbicides/Pesticides and TAL metals.

To characterize stockpiled soil for potential beneficial reuse on-site or for off-site disposal, two soil samples (SP1501 and SP1502) were collected and analyzed for VOCs, SVOCs, PCBs, TPH, Herbicides/Pesticides and TAL metals.

Exploration locations are shown on Figure 5.15-1 and analytical results are summarized Figures 5.15-2 and 5.15-3 and on Table 5.15-1 and 5.15-2.

5.15.2 Findings

In the soil from borings located adjacent (downgradient) to the cooling tower foundations (PCS 15-1), with the exception of acetone, no VOCs or PAHs were detected above reporting limits. Total metal concentrations were below the RVSS in each sample with the exception of vanadium. Concentrations of vanadium ranged from 14.1 to 18.8 mg/kg, below the Site background value of 28 mg/kg. In the groundwater grab samples (GW1501 through GW1504) collected at this PCS, with the exception of acetone, no VOCs were detected. Several PAHs were detected at concentrations below the VT GES in the sample collected from DP1504. Total metal concentrations for several compounds exceeded the propose VT GES however; the elevated concentrations are likely associated with suspended solids as the samples were turbid.

Soil samples collected from the former cooling tower sediment storage area (PCS 15-2), with the exception of acetone, no VOCs above laboratory reporting limits. Several PAHs were detected at low concentrations in the surface soil sample collected from DP1506. Total metal concentrations were below the RVSS with the exception of vanadium, which ranged from 9.8 mg/kg to 22.7 mg/kg, below the Site background value of 28 mg/kg. In the grab groundwater samples (GW1505 and GW1506) collected at this PCS, no VOCs were detected. A trace concentration of the PAH phenanthrene was detected in the groundwater collected from DP1506. Total metal concentrations for several compounds exceeded the propose VT GES however; the elevated concentrations are likely associated with suspended solids as the samples were turbid.

In the laydown and soil stockpile areas (PCS 15-3), with the exception of acetone, no VOCs, TPH, PCBs, herbicides or pesticides were detected above laboratory reporting limits. Several PAHs were reported at concentrations below the RVSS in the surface soil samples (0 to 1 ft bgs) collected at each boring (DP1507 and DP1508) however; they were not detected in the deeper soil samples at these locations. In the grab groundwater samples (GW1507 and GW1508) collected from this PCS, no TPH, PCBs, pesticides or herbicides were detected. VOCs were reported in the sample (GW1507) collected from DP1507 however; trace concentrations of the VOCs bromodichloromethane, chloroform, and dibromochloromethane were reported in the sample (GW1508) collected from DP1508. Low concentrations of PAHs were detected in both samples, below the VT GES. Concentrations of total metals reported were all below the VT GES.

In the stockpiled soil, no VOCs, PCBs or herbicides were detected. A trace concentration of 4,4'-DDT was detected in SP1501 however; it was not detected in the duplicate sample from this location. Trace concentrations of several PAHs and TPH (DRO) were detected in SP1502. Concentrations of these compounds were all below the RVSS. Total metal concentrations were below RVSS or Site background values.

5.15.3 Conceptual Site Model

Previous reports indicated the cooling towers were constructed on timber supports that were coated with creosote. According to Site personnel that were there at the time of the tower construction, the towers were constructed on concrete foundations. Due to the inconsistent information, PCS 15-1 was still evaluated to determine if there were impacts from the cooling tower support structures to the site

soil and groundwater via leaching and infiltration. Based on the analytical results, there are no significant impacts to soil or groundwater from the cooling towers (PCS 15-1).

The area between the two cooling towers was once used for the temporary storage of sediment and silt from the cooling towers (PCS 15-2). Investigation of this area was performed to determine if COCs leached from the stockpiled materials impacting soil and/or groundwater. Based on the analytical results, there are no significant impacts to soil or groundwater from this PCS.

The laydown area (PCS 15-3) was used to store solid wastes (soil, concrete debris, asphalt, wood, brush, etc.) south of the cooling towers. This area was evaluated to determine if COCs leached from materials in storage into the soil, potentially infiltrating to the groundwater. Based on the analytical, surface soil and groundwater in this PCS are slightly impacted.

5.15.4 Recommendations

No further evaluation of PCSs 15-1 and 15-2 are recommended at this time. Although the elevated metal concentrations in the grab groundwater samples in this AOC are likely associated with suspended solids in the turbid water samples, we recommend the installation of a monitoring well to further monitor impacts in the laydown area (PCS 15-3) as well as metal concentrations.

5.16 AOC 16 – RAILROAD LINES

There are existing railroad lines that transverse the Site, some of which are in grassy, unpaved areas. Historical practices may have included the use of pesticide/herbicide applications to control wildlife/ plant growth along these areas. In addition, the wooden ties may have been treated with PAHs for weathering purposes. In preparation for decommissioning, the rail lines have been refurbished and two spurs extended to both the Turbine Building and to the south side of power block to facilitate the transportation and disposal of waste shipments.

5.16.1 Investigation Activities

The areas adjacent to the original tracks were characterized by collecting surface soils (0-1 ft bgs) along the railroad tracks, in grassy areas approximately every 200 feet, for a total of 10 soil samples, plus a field duplicate. Samples were collected from the grassy areas and not from below the gravel bed due to the narrow width of the tracks. Should the cars have a release, the grassy area would be directly below the outside limit of the car. Samples were submitted for analysis of COCs which included herbicides, pesticides and PAHs.

Sample locations are shown on Figure 5.16-1 and analytical results are summarized Figure 5.16-2 on Table 5.16-1.

5.16.2 Findings

Of the eleven surface soil samples collected to evaluate this AOC, herbicides were not detected above laboratory reporting limits. Pesticides were detected in two samples (SS1606 and SS1607). The pesticide 4,4-DDT was detected in SS1606 and 4,4’-DDT and 4,4’-DDE were detected in SS1607.

PAHs were detected at low concentrations in all but one location sampled (SS1604). Concentrations were below RVSS with the exception of benzo(a)pyrene at SS1605, SS1609, and SS1610. These concentrations also exceeded the TEQ for benzo(a) pyrene as well (See Appendix J).

5.16.3 Conceptual Site Model

Pesticides and herbicides were commonly used by railroads for vegetation management. However, herbicides were not detected in soils along the rail lines, and pesticides were detected infrequently, and at negligible concentrations. As previously mentioned, the use of DDT was banned in the US in 1972. DDE has no commercial use and is a breakdown compound of DDT.

PAHS detected in the soil are likely the result of leaching from the treated wooden railroad ties and general industrial activities.

5.16.4 Recommendations

The rail lines on-site are currently being used to facilitate decommissioning activities and will be used to ship wastes from Site. Once use of the lines are no longer required and raillines and ties are removed, we recommend soil along this AOC be further evaluated and remediated, if necessary. At this time, additional shallow soil sample should be collected to delineate the vertical and horizontal extent of impacted soils.

6. Site-Wide Groundwater (AOC 17)

Groundwater at the Site has been characterized for physical properties (i.e. flow direction and hydraulic conductivity) under the Radiological Environmental Monitoring Program (REMP) as well as ENVY's response to tritium releases from the AOCs. With these programs, a total of 62 wells have been installed across the Site, with a large concentration of wells located on the downgradient or east side of the plant. The list of wells and the available construction information is provided in Table 6-1. For wells where the construction details are not available, the information obtained from them is treated as 'screening' level data.

6.1 INVESTIGATION ACTIVITIES

As part of this SI, groundwater samples were collected from 32 of the 62 existing wells and submitted to the laboratory for non-radiological or chemical constituents including VOCs, SVOCs, PCB, herbicides, pesticides, inorganics and/or PFAS. This effort also represented the first sampling event of the approved Quarterly Groundwater Monitoring Program. Groundwater samples from the wells were collected using low flow/low stress sampling methods. Groundwater sampling records are provided in Appendix F. Groundwater elevation data was collected from the surveyed wells in March 2019 and again in June 2019. Monitoring well construction details are provided in Table 6-1. Elevation data from these wells is presented in Table 6-2.

In addition to the groundwater samples from the existing well network, 'grab' groundwater samples were also collected for laboratory analysis at 55 drilled soil exploration locations. These samples were collected from open boreholes at AOCs where there was a potential for historical activities to impacted groundwater quality. It should be noted that the groundwater grab samples were collected to evaluate if there were significant impacts and to provide data to determine if additional groundwater monitoring wells are needed. Because of the method of sample collection, often the samples were turbid, and the resulting data reported elevated metals results. For these locations, downgradient monitoring well data provides a better assessment of Site conditions.

Monitoring well locations as well as groundwater grab sample locations are shown on Figure 6-1. Analytical results for groundwater monitoring well samples and grab samples are summarized on Table 6-3, the laboratory data is provided in Appendix H, and validation reports are provided in Appendix I.

6.2 FINDINGS

Based on the groundwater elevation measurements, ground water contours are consistent with previous investigations. Groundwater contours from the first and second quarter of 2019 are presented in Figures 6-2 through 6-5. Data collected during this investigation did not include hydraulic conductivity testing.

Groundwater analytical data are evaluated against the VT GES. In general, groundwater at the site has not been significantly impacted by historic operations.

Groundwater Sample Results: No VOCs, SVOCs, PCBs, or PFAS were detected in the groundwater monitoring well network. No metals other than manganese were detected in the groundwater monitoring well network at concentrations above the VT GES. For the groundwater samples collected

from the groundwater monitoring wells via low flow/low stress sampling methods, manganese was reported at a concentration of 1,270 ug/L at one lotion (monitoring well 202) exceeding the VT GES of 300 ug/L. Of the 32 wells sampled, this detection of manganese is the only result that exceeded VT GES criteria.

Per §35-401(h) of the I-Rule, states that "All detected compound concentrations shall be compared to the Vermont Groundwater Enforcement Standards". However, in the case where the detection limit exceeds the criteria, the non-detected value must be considered an exceedance and addressed accordingly. The only organic compound with a detection limit above the MDL collected from monitoring wells was naphthalene. Naphthalene was reported as both and VOC and SVOC and for both, the results exceeded the VT GES or 0.5 ug/L. The majority of the naphthalene MDLs under VOCs was at 0.5U ug/L. No other organic compounds were detected in this data set. Similarly for inorganics, thallium was also reported with a detection limit above the VT GES criteria. Like naphthalene, this has been reported as an exceedance, but it is unlikely that groundwater has been impacted by this inorganic compound.

Groundwater Grab Sample Results: For groundwater samples collected from the open boring, these data were intended to be used as screening level data, knowing that the elevated turbidity and drilling methods may bias the analytical data. Similar to the groundwater samples collected from the monitoring wells, the detection limits for naphthalene (both as a VOC and an SVOC) exceeded the VT GES.

Ten fuel-oil related VOCs were detected in the grab sample collected from DP-502 associated with AOC 5 – Turbine Building. Of those VOCs, 1,2,4-trimethylbenzene and naphthalene exceeded the VT GES. The only other VOCs detected in groundwater grab samples were from samples collected from boring DP-1508 (from AOC 15 – Cooling Towers). Bromodicloromethane (2.5 ug/L), trichloromethane (8.5 ug/L) and dibromochloromethane (0.67J ug/L) were detected in this sample at low concentrations, but these COCs do not have VT GES criteria. Groundwater at this location will be evaluated further to confirm their presence in groundwater and evaluated for the potential impacts to both human and ecological receptors.

In addition to the 55 groundwater grab samples submitted for VOCs and SVOCS, four groundwater grab samples were submitted from borings DP-502, DP-504, DP-807, and DP808 for PFAS. These locations are associated with AOC 5 – Turbine Building and AOC 8 – Transformers. Each of these locations are outside the southwestern corner of the Turbine Building, where there have been historic releases of fuel oil and large transformers, in addition to being near the Maintenance Shop. As discussed in Subsections 5.5 and 5.8, PFAS were detected in all groundwater samples collected with the calculated cumulative values (as defined in the I-Rule) exceeding the VT GES. It should be noted that water samples were collected from each of the potable systems onsite and no PFAS were detected in the potable water.

Finally, as noted above the groundwater grab samples submitted for laboratory analysis were collected through open bore holes and were therefore turbid, biasing the inorganic results. The data to not indicate a significant release at any of the locations but reflect an increase in total suspended solids and naturally occurring inorganic compounds, commonly associated with soils. These findings are also supported by downgradient groundwater monitoring well data, where samples were below the VT GES standards.

A summary of all groundwater data is presented in Table 6-1, with laboratory and validation reports provided in Appendix H and I. Groundwater data exceeding VT GES criteria is shown on Figure 6-6.

6.3 CONCEPTUAL SITE MODEL

Groundwater is encountered at approximately 5 to 30 ft bgs. On a regional scale, groundwater below the Site flows towards the Connecticut River, however, on a local scale the flow directions are influenced by the deep basement and structures.

With the exception of the areas near the southwest corner outside the Turbine Building, groundwater at the Site is generally of good quality and meets the VT GES standards. Deeper groundwater, from within the bedrock is also used for potable use, and with the exception of a recent detection of natural uranium (at 20.5 ug/L and 21.3 ug/L) all deeper wells meet VT GES standards as well.

6.4 RECOMMENDATIONS

Although groundwater is not significantly impacted at the Site, quarterly groundwater monitoring will continue under the approved Groundwater Monitoring Work Plan (appended to the Limited Site Investigation Work Plan, [Haley & Aldrich, 2019]). This will provide data to evaluate potential seasonal variations and demonstrate groundwater quality over time.

In addition to the continued program, additional groundwater monitoring wells should be installed near where groundwater grab samples indicated potential impacts. Of note, groundwater well(s) should be installed where the PFAS and other VOCS were detected at AOC 5 - Turbine Building and AOC 8 – Transformers. Upgradient groundwater samples should also be collected to evaluate whether the PFAS detected in shallow groundwater are Site-related. These data will also support decisions with respect to dewatering options, should that be determined necessary as part of the D&D effort. Additional data are also warranted to verify the presence of naphthalene and other constituents where the detection limits exceeded the VT GES.

7. Site-Wide Conceptual Site Model

This section presents a CSM based on the results of the SI activities and other available data.

The VYNPS is located along the west bank of the Connecticut River, along the east side of Governor Hunt Road, in Vernon, Vermont. Construction of the plant began in 1967, and VYNPS generated power through 2014, when it shut down with a goal of preparing to be in SAFSTOR within approximately 60 years.

On 11 January 2019, the land, spent fuel and NRC licenses were transferred to NNDC with a goal of decommission the Site on an accelerated schedule and to reach license termination under the NRC and Site closure under VT ANR with all structures removed to four feet below grade. This SI Report represents the first step in demonstrating compliance with VT ANR and the I-Rule.

During construction, shallow bedrock was blasted to allow for the deep basement structures of both the Turbine and Reactor Buildings as well as deep supporting structures including the intake and discharge facilities. Shallow soils were removed and much of the power block backfilled with structural fill. Prior to construction of the VYNPS, and abed on aerial photographs, the area was open farmland and not used for industrial activities.

Groundwater at the site, as expected, flows towards the Connecticut River. Groundwater within the overburden flows at an approximate rate of 0.9 to 2.45 feet/day.

As part of this SI, 17 AOCs were identified as areas where historic operations had the potential to release non-radiological (or chemical) constituent to the environment. The Limited Non-Radiological Sampling Plan (approved by VT DEC on 21 June 2019) was implemented to confirm/deny these potential impacts in accessible areas. It should be noted that several areas will be evaluated at a later date, once buildings are decontaminated/removed to allow for more thorough inspection and evaluations. A summary of the findings of each AOC is provided in Table 7-1.

In general, the Site has limited impacts from plant operations. Constituents were not detected in soil at the majority of AOCs at concentrations above RVSS, suggesting that those soils are not significant sources of contamination. Soil samples collected at AOCs 5, 7 and 8 were associated with concentrations of PAHs and chlorinated solvents that exceeded VRSS. These AOCs also coincide with areas where releases have been documented and previous investigation activities have occurred. Within these AOCs, most of the impacted soils are shallow and do not extend to deeper soils or groundwater. No evidence of non-aqueous phase liquids or identification of significant new releases were identified.

Shallow groundwater has been impacted by VOCs and PFAS in the vicinity of the area outside the southwest corner of Turbine Building (AOC 5), the Main Transformer (AOC 8), as well as the area near the fuel tanks (AOC 7). These areas, are the only areas of the Site where a potentially complete migration pathway from soil to groundwater may exist. However, at these locations the groundwater samples were collected via open boreholes (groundwater grabs) and therefore constituent concentrations may be biased high due to elevated suspended solids in the grab samples. PFAS were not detected in the bedrock monitoring wells and the Site's potable wells but were detected in

groundwater grab samples collected near the southwestern corner of the Turbine Building. Additional data are needed to evaluate if the source of PFAS is from site activities or from off-site migration.

As noted in Section 3.0, groundwater grab samples collected from open boreholes also show elevated concentrations of inorganics, but based on the samples collected from the monitoring wells (using low flow/low stress sampling methods), it is likely that these detections are an artifact of the elevated turbidity in the grab samples and do not represent actual groundwater conditions. Samples collected form the Groundwater monitoring wells did not show evidence of site-related impacts.

Analytical data from the sampling of storm sewer sediments indicates that potential migration pathways from AOCs to storm water are generally insignificant. However, elevated metal concentrations were observed in the sediment at the 345-kV Switchyard Outfall (PCS 14-4).

The SI activities conducted to date show that although there are limited impacts, they are associated with areas of previously identified releases, and are consistent with the preliminary CSM. Although a formal Risk Assessment has not been conducted, the detected concentrations in environmental media at the Site are not expected to pose and unacceptable risk to site workers or ecological receptors. A Risk Assessment will be conducted in accordance with the procedures outlined in Section 4 of the I-Rule after additional data are collected.

Additional characterization activities will continue with a goal of identifying and delineating shallow/limited excavations to remediate impacted soils and to meet residential criteria and site closure. As noted in Sections 5 and 6, additional groundwater wells should also be installed to better characterize groundwater quality as well as to better understand the distribution of PFAS in shallow groundwater.

8. Site-Wide Conclusions and Recommendations

8.1 CONCLUSIONS

The investigation activities, completed in April and May of 2019, provided data to confirm/deny that historic site operations impacted environmental media. Consistent with the initial CSM, there are several areas that will warrant remediation, but in general, as with other nuclear power plants, the soils and groundwater are not significantly impacted. In addition to the conclusions presented in Sections 6 and 7, general site-wide conclusions are summarized below. The specific conclusions by AOC and PCS are summarized on Table 7-1 and for ease of interpretation, also summarized briefly by AOC in Section 8.2. Below provides a general overview of the conclusions from this investigation.

- Geology is understood and is well characterized. In general, the Site bedrock has been modified during construction which created a "bowl shaped depression" that opens at the intake structures to the Connecticut River. Bedrock consists of metamorphics within the Brattleboro syncline. Overburden soils include clays, sands and gravel, as well as, structural fill.

- Hydrogeology has been well characterized during previous investigations, with the additional data collected during this SI supporting the initial CSM.

- Vanadium has been detected in all soil samples at concentrations exceeding the VT VSSs. As demonstrated in Section 4.5, this is likely a naturally occurring background condition.

- The VOC, 1,2,3-trichloropropane, was reported at an MDL exceeding the RVSSs of 0.00311 mg/kg, but below the NRVSS criteria. For most sample locations, no other VOCs were detected, and the associated MDLs were below the applicable criteria.

- MDLs for several constituents exceed the VT GES criteria. Notably naphthalene was consistently reported in groundwater with an MDL of 0.5U ug/L. This value is at the VT GES of 0.5 ug/L and for the majority of groundwater samples, no other VOCS or SVOCs were detected. Thallium was also detected in samples collected from monitoring wells at an MDL exceeding the VT GES criteria of 2 ug/L.

- Groundwater grab samples exceeded VT GES criteria for inorganics. This may be an artifact of elevated turbidity in the samples because they were collected from open bore holes and not from monitoring wells. Metals in groundwater will be further evaluated.

- This investigation identified AOCs where soil and groundwater were impacted by historic operations. These areas were identified predominantly at AOCs 5, 7, and 8, and are consistent with the initial CSM. There are several other AOCs with low concentrations of chemical constituents, but no additional impacts or source areas were revealed that were not previously identified or are not typically associated with industrial activities (i.e. low concentrations of PAHs, or SVOCs). A complete list of the AOC-specific conclusions are provided Table 7-1, presented in Section 5, and briefly summarized below:

- AOC 1 – 345 kV Switchyard. No significant chemical impacts were observed and even though access was not granted inside the switchyard, releases from the Former Spare Main Transformer would have impacted adjacent surface soils and infiltrated soils to the groundwater table. Evidence of a release was not observed during screening of the subsurface soils or in either sample submitted for analysis.

- AOC 2 – 115 kv switchyard. As noted in Section 3.2, access to the substations was not provided by VELCO during this investigation. NNDC will continue to work with VELCO to arrange access for sample collection.

- AOC 3 – Former South Warehouse. Trace concentrations of benzene were detected near the former diesel UST (DP0301) as well as DRO and GRO. Several SVOCs/PAHs were detected in the shallow soil (0-1 ft bgs) samples collected from the former warehouse operations area.

- AOC 4 – Former North Warehouse. This AOC was closed out following the 2016 and 2017 investigations. No additional investigation activities were warranted as part of this investigation.

- AOC 5 – Turbine Building. Several VOCs and PAHs were detected at PCS 5-2, (the former 5,000-gallon UST). Concentrations of naphthalene and benzo(a)pyrene exceeded the RVSS. DRO and GRO were also detected at significant concentrations. Additionally, a strong petroleum odor, staining and a sheen were observed. Low concentrations of PFBA were detected in the shallow soil collected from DP0502 and DP0504. Solvents and PFAS were also detected in groundwater samples collected from this AOC.

- AOC 6 – Radiological Waste Building and Tanks. No significant chemical impacts were observed in soils and/or groundwater samples collected from this AOC.

- AOC 7 – Fuel Storage Tanks. Several fuel oil related impacts were observed in soils and warrant additional investigations to delineate the extent, once the tanks are removed.

- AOC 8 – Transformers. Trace concentrations of PAHs and DRO were detected in shallow soils. No PCBS or dioxins/furans were detected in the groundwater grab samples (GW0807 and GW0808), however several PFAS were detected in the groundwater at both locations, as noted above in conjunction with AOC 5.

- AOC 9 – Intake and Discharge Systems. Due to the enclosed hydraulic systems and their locations, no sampling was proposed for this AOC as part of this phase of investigation. Soil samples should be collected from the area surrounding the diesel AST following removal/demolition activities.

- AOC 10 – Parking Lots. Herbicides were not detected above laboratory reporting limits in any of the samples collected from PCS 10-4. Pesticides 4,4'-DDE and 4,4'-DDT were detected at concentrations below the RVSS in the two soil samples collected from DP1013 located adjacent to the east (downgradient) side of the "dog pound". No impacts to groundwater were observed.

- AOC 11 – Hazardous Materials Storage. Fuel oil related constituents were detected at a low concentration in deeper soils at concentrations consistent with industrial properties. Low concentrations of naphthalene and manganese were reported in the groundwater at this AOC.

- AOC 12 – Former Edson's Gulf Station and Garage. Based on the data collected, it does not appear that historic/potential releases associated with the former facility operations have significantly impacted subsurface soils and/or infiltrated to the water table impacting site groundwater quality.

- AOC 13 – Septic Systems and Application Areas. Several metals and SVOCS were identified at low concentrations at the South and North Application Fields. Stockpiled soil in the North Application Field area was characterized for potential beneficial reuse on-site and/or off-site disposal. Stockpiled soil contained the PAH, benzo(a)pyrene, above the RVSSs.

- AOC 14 – Storm Water Outfalls. Low concentrations of petroleum-related constituents, metals, and dioxins were detected in the sediment from the North System Outfall (PCS 14-1). This outfall receives storm water from paved areas within and outside the Protected Area. Any petroleum releases to the pavement within these areas may have been mobilized via storm water, however dioxins and metals may be attributed to background concentrations and will be evaluated further.

- AOC 15 – Cooling Tower Area. Based on the analytical results, there are no significant impacts to soil or groundwater from the cooling towers (PCS 15-1), or the site from the cooling towers (PCB 15-2). The laydown area (PCS 15-3) was used to store solid wastes (soil, concrete debris, asphalt, wood, brush, etc.) south of the cooling towers. This area was evaluated to determine if COCs leached from materials in storage into the soil, potentially infiltrating to the groundwater. Based on the analytical, surface soil and groundwater in this PCS are slightly impacted.

- AOC 16 – Railroad Lines. PAHs and pesticides were detected at low concentrations in shallow soils.

  AOC 17 – Groundwater. With the exception of the areas near the southwest corner outside the Turbine Building, groundwater at the site is generally of good quality and meets the VT GES standards. Deeper groundwater, from within the bedrock, is also used for potable use, and with the exception of a recent detection of natural uranium (at 20.5 ug/L and 21.3 ug/L) all deeper wells meet VT GES standards as well.

8.2 RECOMMENDATIONS

The following recommendations are based on the findings of these SI activities:

- AOC 1 - 345 kV Switchyard. No further action is recommended at the areas that were accessible, however; if access to the substation can be arranged with VELCO, we recommend the collected of SS0101 and SS0102 to address PCS 1-1.

- AOC 2 – 115 Kv Switchyard. Once access is authorized, samples should be collected to verify environmental conditions. If access is not granted, collect groundwater samples immediately down gradient of the PCSs to confirm no significant environmental impacts from historic operations.

- AOC 3 – Former South Warehouse. Additional screening of shallow soil beneath the concrete floor slab is recommended following building and slab removal. If evidence of a release is observed, samples should be then collected and analyzed for the COCs as listed in Subsection 5.3.

- AOC 4 – Northern Warehouse. No Further Action.

- AOC 5 – Turbine Building. The area outside the southwester portion of the Turbine Building had solvents, petroleum related constituents and PFAS at concentrations exceeding the VT criteria. Additional delineation and investigations are warranted to confirm groundwater conditions and define the extent of impacted soils in to support remedial options.

- AOC 6 – Radiological Waste Building and Tanks. Elevated concentration of manganese was detected in groundwater. Additional groundwater samples will be collected as part of the Quarterly Groundwater Monitoring Program and the results will be evaluated after four quarters of data have been collected and validated.

- AOC 7 – Fuel Storage Tanks. There are multiple tanks associated with this AOC. The recommendations from Section 5.7 are summarized below:

  - There are currently several structures and an active paved access road surrounding the 75,000-gallon fuel oil AST (PCS 7-2). Drill rig access to this area for additional borings is limited. Additional investigations will be conducted once the tank is removed from service and surrounding structures are demolished.

  - Impacts to soil in the vicinity of the 9,600-gallon diesel fuel AST (PCS 7-3) were below VSS criteria. Based on the detection of PAHs in the sample collected just above the groundwater table, additional groundwater investigations are warranted, including the installation and sampling of a monitoring well directly downgradient of this PCS.

  - Impacted surface soil at the Shipping and Receiving Building (PCB 7-6) contained several COCs that exceeded the RVSS. This area will be addressed through excavation and off-site disposal. Confirmatory soil samples will be collected from the bottom and sidewalls of the remedial excavation.

- AOC 8 – Transformers. Installation of a monitoring well at the Main Transformer and continued monitoring of groundwater for PFAS this location is recommended.

- AOC 9 – Intake and Discharge Systems. Due to the enclosed hydraulic systems and their locations, no sampling was proposed for this AOC as part of this phase of investigation. Soil samples should be collected from the area surrounding the diesel AST following removal/demolition activities.

- AOC 10 - Parking Lots. No Further Action at this time. Once the asphalt has been removed, a walk down and survey of the underlying soils is recommended to evaluate it there have been releases or if there are areas of impacted soils.

- AOC 11 – Hazardous Materials Storage. No further investigation of soils is recommended. Groundwater quality monitoring will continue as part of the Site Groundwater Monitoring Plan.

- AOC 12 – Former Edson's Gulf Station. Other than manganese, no COCs were reported at concentrations exceeding the RVSS for PCSs 12-1 and PCS 12-3. No further investigation is recommended for these PCSs. Further evaluation of PCSs 12-2, 12-4 and 12-5 is recommended at the time of building demolition to evaluate soils and if impacted, groundwater.

- AOC 13 – Septic Systems and Application Areas**.** With the exception of the South Application Field, no further investigation is recommended. For the South Application Field (PCS 13-4), monitoring of the associated wells as part of the Quarterly Groundwater Monitoring Plan is recommended. Due to the detection of several SVOCs at low concentrations in both the surface soil and grab groundwater samples, monitoring well samples will be analyzed for the full suite of SVOCs during the next monitoring event.

- AOC 14 – Storm Water Outfalls. Additional sediment may be collected to evaluate if related metals at the outfalls are site related or typical of River conditions.

- AOC 15 – Cooling Tower Area. Data to be evaluated under a site-wide risk assessment following collection of four quarter of groundwater data.

- AOC 16- Railroad Lines. The rail lines on-site are currently being used to facilitate D&D activities and will be used to ship wastes from Site. Additional shallow soil samples are recommended for collection to delineate the lateral and vertical extent of PAHs in soils and to identify if the PAHs are due to rail operations or attributed to historic/fill or industrial operations. Once use of the lines is no longer required and rail lines and ties are removed, we recommend soil along the rail line in this AOC be further evaluated and remediated, if necessary.

- AOC 17 – Groundwater. Groundwater at the site is well characterized. Because there were limited detections of chemical constituents in groundwater grab samples, several additional monitoring wells are recommended in associate with AOC 5, 7 and 8, and will be incorporated into the Site's Quarterly Groundwater Monitoring Program. Additionally, more background data are warranted for PFAS to better understand if they are limited to AOCs 5 and 8, or if they are potentially from off-site/upgradient sources.

Work conducted under this Limited Non-Radiological Site Sampling Plan was intended to collect data to better understand environmental conditions and to focus future investigations to streamline site closure efforts. In addition to the recommendations listed above, the future soil and groundwater sample detection limits will be below the RVSS and VT GES criteria (barring any dilution issues in significantly contaminated samples). Specifically, it is anticipated that the lower reporting limits will demonstrate that groundwater does not have site wide issues with respect to naphthalene and thallium.

The next phase of work will be to continue working with the D&D project and complete site inspections following the removal of building slabs and paved areas. This will include a supplemental work plan to

capture the recommendations listed above and provide sufficient details in areas with confirmed impacts to collect the data needed to delineate the soil volumes recommended for remediation (i.e. excavation and off-site disposal).

The next groundwater sampling event is scheduled for August 2019. The additional groundwater monitoring wells may not be installed at that time; they will be added to the program as soon as installation and development is complete. In addition to groundwater well installation, when the licensed driller is onsite, it is also recommended that the wells not included in the Quarterly Groundwater Monitoring Program be property abandoned to prevent damage during construction activities.

After additional data collection activities have been completed and the nature and extent of contamination at AOCs has been defined, the data will be evaluated in a risk assessment following the procedures outlined in Section 4 of the I-Rule. The results of the risk assessment will be used to inform remedial decisions or demonstrate that the AOC is suitable for no further action and regulatory closure.

The MOU #8880 between VT ANR and NNDC included a defined schedule to compete an approved scope of work with this SI Report to be submitted by 11 July 2019. This has been completed. To continue towards site closure, the final recommendation is to update the Site Restoration schedule to include the recommended scope of work, with the next phase or work to be completed as soon as practicable and in coordination with the ongoing D&D program.

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6. Haley & Aldrich, 2019b. Quality Assurance Project Plan, Rev F. April 2019

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9. VT ANR, 2017b. An Evaluation of PAHs, Arsenic, and Lead, Background Soil Concentrations in Vermont. April 2017. (,https://dec.vermont.gov/waste-management/contaminated-sites/statewide-soil-report)

10. VT ANR 2019. Investigation and Remediation of contaminated Properties Rule (IROCPR), Vermont Agency of Natural Resources, July 2019 (I-Rule)

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12. CRC, 2019. Connecticut River Conservancy, 2019. Is It Clean? June 2019.

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TABLES

TABLE 4.0-1
SUMMARY OF LOCATION COORDINATES
NON-RADIOLOGICAL SITE INVESTIGATION
VERMONT YANKEE NUCLEAR POWER STATION
VERNON, VERMONT

Sample Location ID[1]	AOC	Longitude (x)	Latitude (y)
DP0101	1	-72.5149105	42.7807144
DP0301	3	-72.5128324	42.7780678
DP0302	3	-72.5124623	42.7781222
DP0303	3	-72.5131069	42.7779394
DP0304	3	-72.5132862	42.7777870
DP0501	5	-72.5139096	42.7782860
DP0502	5	-72.5136722	42.7784333
DP0503	5	-72.5136946	42.7783144
DP0504	5	-72.5136771	42.7785227
DP0601	6	-72.5126389	42.7794910
DP0602	6	-72.5125350	42.7792740
DP0701*	7	-72.5163333	42.7785111
SS0701*	7	-72.5126472	42.7783722
DP0702*	7	-72.5163861	42.7785556
SS0702*	7	-72.5132917	42.7777361
DP0703	7	-72.5129046	42.7782413
SS0703*	7	-072.5135000	42.7777833
DP0704	7	-72.5125621	42.7782590
SS0704*	7	-72.5125750	42.7784722
DP0705	7	-72.5131952	42.7777215
SS0705*	7	-72.5125833	42.7795917
DP0706*	7	-72.5139778	42.7755000
DP0707*	7	-72.5139306	42.7754861
DP0708*	7	-72.5139472	42.7755000
SS0801	8	-72.5134793	42.7771571
SS0802	8	-72.5123517	42.7788297
SS0803	8	-72.5134035	42.7795171
SS0804	8	-72.5163643	42.7784127
SS0805	8	-72.5120191	42.7771269
SS0806	8	-72.5133749	42.7771915
SS0807	8	-72.5139239	42.7787384
SS0808	8	-72.5139562	42.7785946
SS0809	8	-72.5137597	42.7785975
SS0810	8	-72.5142057	42.7790285
SS0811	8	-72.5141525	42.7789247
DP1011	10	-72.5162518	42.7808560
DP1012	10	-72.5156515	42.7813498
DP1013	10	-72.5157395	42.7814790
DP1101	11	-72.5121217	42.7780632
DP1102*	11	-72.5132222	42.7751056
DP1103	11	-72.5152760	42.7803864
DP1201	12	-72.5154611	42.7749261
DP1202	12	-72.5154492	42.7748560

[1] Sample IDs marked with an asterisk (*) have coordinates obtained via Google Earth software and are subject to lower accuracy.

TABLE 4.0-1
SUMMARY OF LOCATION COORDINATES
NON-RADIOLOGICAL SITE INVESTIGATION
VERMONT YANKEE NUCLEAR POWER STATION
VERNON, VERMONT

Sample Location ID[1]	AOC	Longitude (x)	Latitude (y)
DP1203	12	-72.5152725	42.7750828
DP1204	12	-72.5153820	42.7750418
DP1205	12	-72.5155331	42.7749209
DP1206	12	-72.5155073	42.7748475
DP1209	12	-72.5150491	42.7749998
DP1301	13	-72.5145959	42.7807940
SP1301*	13	-72.5167861	42.7833389
DP1302	13	-72.5148298	42.7799913
SP1302*	13	-072.5169722	42.7833361
DP1303	13	-72.5136442	42.7773429
DP1304	13	-72.5130017	42.7774952
DP1305*	13	-72.5176333	42.7803472
DP1306	13	-72.5130896	42.7744046
DP1307	13	-72.5138716	42.7749034
DP1308	13	-72.5139203	42.7738596
DP1309	13	-72.5173801	42.7837371
DP1310	13	-72.5172216	42.7833178
DP1311	13	-72.5172963	42.7835862
SD1401*	14	-72.5136667	42.7808333
SD1404*	14	-72.5147306	42.7812222
SD1405*	14	-72.5151694	42.7821278
SD1406*	14	-72.5163306	42.7831583
DP1501	15	-72.5118863	42.7765647
SP1501*	15	-72.5119167	42.7754056
DP1502	15	-72.5119018	42.7759175
SP1502*	15	-72.5118889	42.7753500
DP1503	15	-72.5129735	42.7760010
DP1504	15	-72.5129678	42.7766959
DP1505	15	-72.5125287	42.7762338
DP1506	15	-72.5122928	42.7758253
DP1507	15	-72.5116097	42.7755370
DP1508	15	-72.5119375	42.7753514
SS1601	16	-72.5228794	42.7822858
SS1602	16	-72.5219951	42.7821348
SS1603	16	-72.5204508	42.7818901
SS1604	16	-72.5192890	42.7817427
SS1605	16	-72.5182647	42.7814365
SS1606	16	-72.5176317	42.7809955
SS1607	16	-72.5172709	42.7804610
SS1608	16	-72.5169837	42.7798453
SS1609	16	-72.5167296	42.7793826
SS1610	16	-72.5162842	42.7789369

[1] Sample IDs marked with an asterisk (*) have coordinates obtained via Google Earth software and are subject to lower accuracy.

TABLE 4.0-2
SUMMARY OF SOIL AND SEDIMENT ANALYTICAL PROGRAM
NON-RADIOLOGICAL SITE INVESTIGATION
VERMONT YANKEE NUCLEAR POWER STATION
VERNON, VERMONT

AOC 1: 345 kV Switchyard

Sample ID	Media	VOCs	SVOCs	TAL Metals	PAHs	PCBs	Dioxins	PFAS	TPH/DRO/GRO	Pesticides	Herbicides
DP0101	Soil	2		2	2	2			2		

AOC 3: Former South Warehous

Sample ID	Media	VOCs	SVOCs	TAL Metals	PAHs	PCBs	Dioxins	PFAS	TPH/DRO/GRO	Pesticides	Herbicides
DP0301	Soil	2		2	2				2		
DP0302	Soil	2	2	2		2			2		
DP0303	Soil	2	2	2					2		
DP0304	Soil	2		2	2				2		

AOC 5: Turbine Building

Sample ID	Media	VOCs	SVOCs	TAL Metals	PAHs	PCBs	Dioxins	PFAS	TPH/DRO/GRO	Pesticides	Herbicides
DP0501	Soil	2		2	2				2		
DP0502	Soil	3		3	3			3	3		
DP0503	Soil	2		2	2				2		
DP0504	Soil	2		2	2			2	2		

AOC 6: Radiological Waste Building & Tanks

Sample ID	Media	VOCs	SVOCs	TAL Metals	PAHs	PCBs	Dioxins	PFAS	TPH/DRO/GRO	Pesticides	Herbicides
DP0601	Soil	2	2	2		2					
DP0602	Soil	2	2	2		2					

AOC 7: Fuel Storage Tanks

Sample ID	Media	VOCs	SVOCs	TAL Metals	PAHs	PCBs	Dioxins	PFAS	TPH/DRO/GRO	Pesticides	Herbicides
DP0701	Soil	2		2	2	2			2		
SS0701	Soil	1		1	1				1		
DP0702	Soil	2		2	2	2			2		
SS0702	Soil	1		1	1				1		
DP0703	Soil	2		2	2				2		
SS0703	Soil	1		1	1				1		
DP0704	Soil	3		3	3				3		
SS0704	Soil	1		1	1	1			1		
DP0705	Soil	2		2	2				2		
SS0705	Soil	2		2	2				2		
DP0706	Soil	2		2	2				2		
DP0707	Soil	2		2	2				2		
DP0708	Soil	2		2	2				2		

AOC 8: Transformers

Sample ID	Media	VOCs	SVOCs	TAL Metals	PAHs	PCBs	Dioxins	PFAS	TPH/DRO/GRO	Pesticides	Herbicides
SS0801	Soil				2	2					
SS0802	Soil				1	1					
SS0803	Soil				1	1					
SS0804	Soil				1	1					
SS0805	Soil				1	1			1		
SS0806	Soil				1	1			1		
SS0807	Soil				1	1	1	1			
SS0808	Soil				1	1	1	1			
SS0809	Soil				1	1	1	1			
SS0810	Soil				1	1					
SS0811	Soil				1	1					

AOC 10: Parking Lot Areas

Sample ID	Media	VOCs	SVOCs	TAL Metals	PAHs	PCBs	Dioxins	PFAS	TPH/DRO/GRO	Pesticides	Herbicides
DP1011	Soil									2	2
DP1012	Soil									2	2
DP1013	Soil									2	2

AOC 11: Hazardous Materials St

Sample ID	Media	VOCs	SVOCs	TAL Metals	PAHs	PCBs	Dioxins	PFAS	TPH/DRO/GRO	Pesticides	Herbicides
DP1101	Soil	2	2	2		2			2		
DP1102	Soil	2	2	2		2			2		
DP1103	Soil	2	2	2		2			2		

TABLE 4.0-2
SUMMARY OF SOIL AND SEDIMENT ANALYTICAL PROGRAM
NON-RADIOLOGICAL SITE INVESTIGATION
VERMONT YANKEE NUCLEAR POWER STATION
VERNON, VERMONT

AOC 12: Former Edson's Gulf Station and Garage

Sample ID	Media	VOCs	SVOCs	TAL Metals	PAHs	PCBs	Dioxins	PFAS	TPH/DRO/GRO	Pesticides	Herbicides
DP1201	Soil	2	2	2					2		
DP1202	Soil	2	2	2					2		
DP1203	Soil	2	2	2		2			2		
DP1204	Soil	2	2	2		2			2		
DP1205	Soil	2	2	2					2		
DP1206	Soil	2	2	2					2		
DP1209	Soil	2	2	2		2			2		

AOC 13: Septic Systems

Sample ID	Media	VOCs	SVOCs	TAL Metals	PAHs	PCBs	Dioxins	PFAS	TPH/DRO/GRO	Pesticides	Herbicides
DP1301	Soil	2	2	2					2		
SP1301	Soil	1	1	1		1			1		
DP1302	Soil	2	2	2					2		
SP1302	Soil	1	1	1		1			1		
DP1303	Soil	2	2	2		2			2		
DP1304	Soil	2	2	2		2			2		
DP1305	Soil	2	2	2		2			2		
DP1306	Soil	2	2	2		2			2		
DP1307	Soil	3	3	3					3		
DP1308	Soil	2	2	2					2		
DP1309	Soil	2	2	2					2		
DP1310	Soil	2	2	2					2		
DP1311	Soil	2	2	2					2		

AOC 14: Stormwater Outfalls

Sample ID	Media	VOCs	SVOCs	TAL Metals	PAHs	PCBs	Dioxins	PFAS	TPH/DRO/GRO	Pesticides	Herbicides
SD1401	Sediment	1	1	1		1	1		1	1	1
SD1404	Sediment	1	1	1		1	1		1	1	1
SD1405	Sediment	1	1	1		1	1		1	1	1
SD1406	Sediment	1	1	1		1	1		1	1	1

AOC 15: Cooling Towers

Sample ID	Media	VOCs	SVOCs	TAL Metals	PAHs	PCBs	Dioxins	PFAS	TPH/DRO/GRO	Herbicides	Herbicides
DP1501	Soil	2		2	2						
SP1501	Soil	2	2	2		2			2	2	2
DP1502	Soil	2		2	2						
SP1502	Soil	1	1	1		1			1	1	1
DP1503	Soil	2		2	2						
DP1504	Soil	2		2	2						
DP1505	Soil	2		2	2						
DP1506	Soil	2		2	2						
DP1507	Soil	3	3	3		3			3	3	3
DP1508	Soil	2	2	2		2			2	2	2

AOC 16: Site Groundwater

Sample ID	Media	VOCs	SVOCs	TAL Metals	PAHs	PCBs	Dioxins	PFAS	TPH/DRO/GRO	Herbicides	Herbicides
SS1601	Soil				1					1	1
SS1602	Soil				1					1	1
SS1603	Soil				1					1	1
SS1604	Soil				1					1	1
SS1605	Soil				1					1	1
SS1606	Soil				1					1	1
SS1607	Soil				1					1	1
SS1608	Soil				1					1	1
SS1609	Soil				1					1	1
SS1610	Soil				2					2	2

TOTAL		VOCs	SVOCs	TAL Metals	PAHs	PCBs	Dioxins	PFAS	TPH/DRO/GRO	Pesticides	Herbicides
		115	**65**	**115**	**73**	**59**	**7**	**8**	**101**	**29**	**29**

TABLE 4.0-3
SUMMARY OF GROUNDWATER ANALYTICAL PROGRAM
NON-RADIOLOGICAL SITE INVESTIGATION
VERMONT YANKEE NUCLEAR POWER STATION
VERNON, VERMONT

Sample ID	VOCs	SVOCs	TAL Metals	PAHs	PCBs	Dioxins	PFAS	TPH/DRO/GRO	Pesticides	Herbicides	Groundwater Grab Sample?
101	1		1	1							
1101	1		1	1	1			1			
1102	1		1	1	1			1			
1302R	1		1	1							
1303	2		2	2	2			2			
201	1		1	1							
202	1		1	1							
203	1		1	1							
204	1		1	1							
3301	1		1	1							
3401	1		1	1							
DP0501	1		1	1				1			X
DP0502	1		1	1			1	1			X
DP0503	1		1	1				1			X
DP0504	1		1	1			1	1			X
DP0601	1	1	1		1						X
DP0602	1	1	1		1						X
DP0807						1	1				X
DP0808						1	1				X
DP1001									1	1	X
DP1002									1	1	X
DP1003									1	1	X
DP1201	1	1	1					1			X
DP1202	1	1	1					1			X
DP1209	1	1	1		1			1			X
DP1306	1	1	1					1			X
DP1307	1	1	1					1			X
DP1308	1	1	1					1			X
DP1309	2	2	2					2			X
DP1310	1	1	1					1			X
DP1311	1	1	1					1			X
DP1501	2		2	2							X
DP1502	1		1	1							X
DP1503	1		1	1							X
DP1504	1		1	1							X
DP1505	1		1	1							X
DP1506	1		1	1							X
DP1507	1	1	1		1			1	1	1	X
DP1508	1	1	1		1			1	1	1	X
GZ-1S	1		1	1							
GZ-2S	1		1	1							
GZ-5S	1		1	1							
GZ-6S	1		1	1							
GZ-8S	1		1	1				1			
GZ-9S	1		1	1							
GZ-11S	1		1	1							
GZ-12D	1		1	1							
GZ-12S	1		1	1							
GZ-13D	2		2	2							
GZ-13S	1		1	1							
GZ-14D	1		1	1							
GZ-14S	1		1	1							
GZ-15S	1		1	1							
GZ-17S	1		1	1				1			
GZ-19D	1		1	1				1			
GZ-19S	1		1	1				1			
GZ-21S	1		1	1							
GZ-22D	1		1	1							
GZ-25S	1		1	1							
GZ-27S	1		1	1	1			1			
NEOB WELL	1						1				
SOUTHWEST WELL	1						1				
WEST WELL	1						1				

TOTAL	VOCs	SVOCs	TAL Metals	PAHs	PCBs	Dioxins	PFAS	TPH/DRO/GRO	Pesticides	Herbicides	Groundwater Grab Samples
	62	14	59	45	10	2	7	25	5	5	28

TABLE 4.0-3
SUMMARY OF GROUNDWATER ANALYTICAL PROGRAM
NON-RADIOLOGICAL SITE INVESTIGATION
VERMONT YANKEE NUCLEAR POWER STATION
VERNON, VERMONT

QA/QC Samples

Sample ID[1]	VOCs	SVOCs	TAL Metals	PAHs	PCBs	Dioxins	PFAS	TPH/DRO/GRO	Pesticides	Herbicides
EB050119	X	X	X		X			X		
TB042619A	X									
TB042619B	X									
TB042919	X									
TB050119A	X									
TB050119B	X									
TB050319A	X									
TB050319B	X						X			
TB050919	X									
TB051019A	X									
TB051019B	X									
TB051519A	X									
TB051519B	X									
TB051619A	X						X			
TB051619B	X									

[1] *EB: Equipment Blank, TB: Trip Blank*

TABLE 4.0-4
SUMMARY OF AOCs
NON-RADIOLOGICAL SITE INVESTIGATION
VERMONT YANKEE NUCLEAR POWER STATION
VERNON, VERMONT

Areas of Concern (AOCs)	
AOC 1	345 kV Switchyard
AOC 2	115 kV Switchyard
AOC 3	Former South Warehouse
AOC 4	Former North Warehouse
AOC 5	Turbine Building
AOC 6	Radiological Waste Building
AOC 7	Fuel Storage Tanks
AOC 8	Transformers
AOC 9	Intake and Discharge Systems
AOC 10	Parking Lots
AOC 11	Hazardous Materials Storage
AOC 12	Former Edson's Gulf Station and Garage
AOC 13	Septic Systems
AOC 14	Storm Water Outfalls
AOC 15	Cooling Tower Area
AOC 16	Railroad Lines
AOC 17	Site Groundwater

TABLE 4.0-5
SUMMARY OF VERMONT RESIDENTIAL AND NON-RESIDENTIAL SOIL STANDARDS
NON-RADIOLOGICAL SITE INVESTIGATION
VERMONT YANKEE NUCLEAR POWER STATION
VERNON, VERMONT

	2019 Vermont Soil Standards	
Volatile Organic Compounds (mg/kg)	**Residential Soil**	**Non-Residential Soil**
1,1,1,2-Tetrachloroethane	1.3	8
1,1,1-Trichloroethane	NA	NA
1,1,2,2-Tetrachloroethane	NA	NA
1,1,2-Trichloroethane	NA	NA
1,1-Dichloroethane	2.1	13
1,1-Dichloroethene	NA	NA
1,1-Dichloropropene	NA	NA
1,2,3-Trichlorobenzene	NA	NA
1,2,3-Trichloropropane	0.00311	0.07
1,2,4-Trichlorobenzene	NA	NA
1,2,4-Trimethylbenzene	144	177
1,2-Dibromo-3-chloropropane (DBCP)	0.01	0.06
1,2-Dibromoethane (Ethylene Dibromide)	0.02	0.14
1,2-Dichlorobenzene	NA	NA
1,2-Dichloroethane	0.29	1.7
1,2-Dichloropropane	1.5	9.1
1,3,5-Trimethylbenzene	144	177
1,3-Dichlorobenzene	NA	NA
1,3-Dichloropropane	NA	NA
1,4-Dichlorobenzene	NA	NA
2,2-Dichloropropane	NA	NA
2-Butanone (Methyl Ethyl Ketone)	16952	26991
2-Chlorotoluene	NA	NA
2-Phenylbutane (sec-Butylbenzene)	7009	102200
4-Chlorotoluene	NA	NA
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	NA	NA
Acetone	40609	100028
Benzene	0.7	4.2
Bromobenzene	NA	NA
Bromodichloromethane	NA	NA
Bromoform	NA	NA
Bromomethane (Methyl Bromide)	NA	NA
Carbon tetrachloride	0.37	2.2
Chlorobenzene	414	726
Chlorobromomethane	193	597
Chloroethane	NA	NA
Chloroform (Trichloromethane)	NA	NA
Chloromethane (Methyl Chloride)	NA	NA
cis-1,2-Dichloroethene	140	1814
cis-1,3-Dichloropropene	NA	NA
Cymene (p-Isopropyltoluene)	NA	NA
Dibromochloromethane	NA	NA
Dibromomethane	NA	NA
Dichlorodifluoromethane (CFC-12)	NA	NA
Ethylbenzene	3.7	22
Hexachlorobutadiene	NA	NA
Isopropylbenzene (Cumene)	256	264
m,p-Xylenes	NA	NA
Methyl Tert Butyl Ether	649	4464
Methylene chloride	NA	NA

TABLE 4.0-5
SUMMARY OF VERMONT RESIDENTIAL AND NON-RESIDENTIAL SOIL STANDARDS
NON-RADIOLOGICAL SITE INVESTIGATION
VERMONT YANKEE NUCLEAR POWER STATION
VERNON, VERMONT

	2019 Vermont Soil Standards	
Volatile Organic Compounds (mg/kg) *(Continued)*	**Residential Soil**	**Non-Residential Soil**
Naphthalene	2.7	16
n-Butylbenzene	3504	51100
n-Propylbenzene	253	261
o-Xylene	NA	NA
Styrene	NA	NA
tert-Butylbenzene	7009	102200
Tetrachloroethene	2.4	14
Toluene	706	798
trans-1,2-Dichloroethene	1402	18137
trans-1,3-Dichloropropene	NA	NA
Trichloroethene	0.68	6.5
Trichlorofluoromethane (CFC-11)	NA	NA
Vinyl chloride	0.1	0.59
Xylene (total)	252	257

	2019 Vermont Soil Standards	
Semi-Volatile Organic Compounds (mg/kg)	**Residential Soil**	**Non-Residential Soil**
1,2,4-Trichlorobenzene	NA	NA
1,2-Dichlorobenzene	NA	NA
1,2-Diphenylhydrazine	NA	NA
1,3-Dichlorobenzene	NA	NA
1,4-Dichlorobenzene	NA	NA
1-Methylnaphthalene	NA	NA
2,2'-oxybis(1-Chloropropane)	2804	36274
2,4,5-Trichlorophenol	NA	NA
2,4,6-Trichlorophenol	NA	NA
2,4-Dichlorophenol	NA	NA
2,4-Dimethylphenol	NA	NA
2,4-Dinitrophenol	NA	NA
2,4-Dinitrotoluene	NA	NA
2,6-Dinitrotoluene	NA	NA
2-Chloronaphthalene	NA	NA
2-Chlorophenol	NA	NA
2-Methylnaphthalene	NA	NA
2-Methylphenol (o-Cresol)	NA	NA
2-Nitroaniline	NA	NA
2-Nitrophenol	NA	NA
3&4-Methylphenol	NA	NA
3,3'-Dichlorobenzidine	NA	NA
3-Nitroaniline	NA	NA
4,6-Dinitro-2-methylphenol	NA	NA
4-Bromophenyl phenyl ether	NA	NA
4-Chloro-3-methylphenol	NA	NA
4-Chloroaniline	NA	NA
4-Chlorophenyl phenyl ether	NA	NA
4-Nitroaniline	NA	NA
4-Nitrophenol	NA	NA
Acenaphthene	NA	NA
Acenaphthylene	NA	NA
Aniline	NA	NA
Anthracene	NA	NA

TABLE 4.0-5
SUMMARY OF VERMONT RESIDENTIAL AND NON-RESIDENTIAL SOIL STANDARDS
NON-RADIOLOGICAL SITE INVESTIGATION
VERMONT YANKEE NUCLEAR POWER STATION
VERNON, VERMONT

	2019 Vermont Soil Standards	
Semi-Volatile Organic Compounds (mg/kg) *(Continued)*	**Residential Soil**	**Non-Residential Soil**
Benzidine	NA	NA
Benzo(a)anthracene	NA	NA
Benzo(a)pyrene	0.07	1.54
Benzo(b)fluoranthene	NA	NA
Benzo(g,h,i)perylene	NA	NA
Benzo(k)fluoranthene	NA	NA
Benzoic acid	NA	NA
Benzyl Alcohol	NA	NA
bis(2-Chloroethoxy)methane	NA	NA
bis(2-Chloroethyl)ether	NA	NA
bis(2-Ethylhexyl)phthalate	20	120
Butyl benzylphthalate	NA	NA
Carbazole	NA	NA
Chrysene	NA	NA
Dibenz(a,h)anthracene	NA	NA
Dibenzofuran	NA	NA
Diethyl phthalate	NA	NA
Dimethyl phthalate	NA	NA
Di-n-butylphthalate	NA	NA
Di-n-octyl phthalate	NA	NA
Fluoranthene	2301	26371
Fluorene	2301	26371
Hexachlorobenzene	0.13	0.69
Hexachlorobutadiene	NA	NA
Hexachlorocyclopentadiene	NA	NA
Hexachloroethane	NA	NA
Indeno(1,2,3-cd)pyrene	NA	NA
Isophorone	NA	NA
Naphthalene	2.7	16
Nitrobenzene	NA	NA
N-Nitrosodimethylamine	NA	NA
N-Nitrosodi-n-propylamine	NA	NA
N-Nitrosodiphenylamine	NA	NA
Pentachlorophenol	0.48	2.9
Phenanthrene	NA	NA
Phenol	NA	NA
Pyrene	NA	NA
Pyridine	NA	NA
Benzo(a)Pyrene Equivalent (ND = 0 RL)	0.07	1.54
Benzo(a)Pyrene Equivalent (ND = 1/2 RL)	0.07	1.54
Benzo(a)Pyrene Equivalent (ND = RL)	0.07	1.54

	2019 Vermont Soil Standards	
Total Petroleum Hydrocarbons (mg/kg)	**Residential Soil**	**Non-Residential Soil**
Total Petroleum Hydrocarbons (C10-C28) DRO	NA	NA
Total Petroleum Hydrocarbons (C6-C10) GRO	NA	NA

TABLE 4.0-5
SUMMARY OF VERMONT RESIDENTIAL AND NON-RESIDENTIAL SOIL STANDARDS
NON-RADIOLOGICAL SITE INVESTIGATION
VERMONT YANKEE NUCLEAR POWER STATION
VERNON, VERMONT

	2019 Vermont Soil Standards	
Inorganic Compounds (mg/kg)	**Residential Soil**	**Non-Residential Soil**
Aluminum	72507	941748
Antimony	26	319
Arsenic	16	16
Barium	11247	127382
Beryllium	35	289
Cadmium	6.9	87
Calcium	NA	NA
Chromium	NA	NA
Cobalt	22	291
Copper	10407	139231
Iron	51302	686351
Lead	400	800
Magnesium	NA	NA
Manganese	1118	11350
Mercury	3.1	3.1
Nickel	940	9707
Potassium	NA	NA
Selenium	366	4900
Silver	237	2483
Sodium	NA	NA
Thallium	0.73	196100
Vanadium	2.8	27
Zinc	21986	294150

	2019 Vermont Soil Standards	
PCBs (mg/kg)	**Residential Soil**	**Non-Residential Soil**
Aroclor-1016 (PCB-1016)	NA	NA
Aroclor-1221 (PCB-1221)	NA	NA
Aroclor-1232 (PCB-1232)	NA	NA
Aroclor-1242 (PCB-1242)	NA	NA
Aroclor-1248 (PCB-1248)	NA	NA
Aroclor-1254 (PCB-1254)	NA	NA
Aroclor-1260 (PCB-1260)	NA	NA
Aroclor-1262 (PCB-1262)	NA	NA
Aroclor-1268 (PCB-1268)	NA	NA
SUM of PCBs	NA	NA

	2019 Vermont Soil Standards	
Other	**Residential Soil**	**Non-Residential Soil**
Total Solids (%)	NA	NA

	2019 Vermont Soil Standards	
Dioxins/Furans (pg/g)	**Residential Soil**	**Non-Residential Soil**
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	2.25	13.7

	2019 Vermont Soil Standards	
Herbicides (mg/kg)	**Residential Soil**	**Non-Residential Soil**
2,4,5-T	NA	NA
2,4,5-TP (Silvex)	NA	NA
2,4-Dichlorophenoxyacetic acid (2,4-D)	NA	NA

TABLE 4.0-5
SUMMARY OF VERMONT RESIDENTIAL AND NON-RESIDENTIAL SOIL STANDARDS
NON-RADIOLOGICAL SITE INVESTIGATION
VERMONT YANKEE NUCLEAR POWER STATION
VERNON, VERMONT

	2019 Vermont Soil Standards	
Pesticides (mg/kg)	**Residential Soil**	**Non-Residential Soil**
4,4'-DDD	NA	NA
4,4'-DDE	NA	NA
4,4'-DDT	NA	NA
Aldrin	0.02	0.1
alpha-BHC	NA	NA
alpha-Chlordane	NA	NA
beta-BHC	NA	NA
delta-BHC	NA	NA
Dieldrin	NA	NA
Endosulfan I	NA	NA
Endosulfan II	NA	NA
Endosulfan sulfate	NA	NA
Endrin	NA	NA
Endrin aldehyde	NA	NA
Endrin ketone	NA	NA
gamma-BHC (Lindane)	NA	NA
gamma-Chlordane	NA	NA
Heptachlor	NA	NA
Heptachlor epoxide	NA	NA
Methoxychlor	NA	NA
Toxaphene	NA	NA

	2019 Vermont Soil Standards	
PFAS (mg/kg)	**Residential Soil**	**Non-Residential Soil**
Fluorotelomer sulfonic acid (4:2 FTSA)	NA	NA
Fluorotelomer sulfonic acid (6:2 FTSA)	NA	NA
Fluorotelomer sulfonic acid (8:2 FTSA)	NA	NA
N-ethyl perfluorooctane sulfonamidoacetic acid (N-EtFOSAA)	NA	NA
N-methyl perfluorooctane sulfonamidoacetic acid (N-MeFOSAA)	NA	NA
Perfluorobutanesulfonic Acid (PFBS)	NA	NA
Perfluorobutanoic Acid (PFBA)	NA	NA
Perfluorodecane sulfonic Acid (PFDS)	NA	NA
Perfluorodecanoic acid (PFDA)	NA	NA
Perfluorododecanoic acid (PFDoDA)	NA	NA
Perfluoroheptane sulfonic acid (PFHpS)	NA	NA
Perfluoroheptanoic acid (PFHpA)	1.22	14.36
Perfluorohexanesulfonic acid (PFHxS)	1.22	14.36
Perfluorohexanoic acid (PFHxA)	NA	NA
Perfluorononane sulfonic acid (PFNS)	NA	NA
Perfluorononanoic Acid (PFNA)	1.22	14.36
Perfluorooctane sulfonamide (FOSA)	NA	NA
Perfluorooctanesulfonic acid (PFOS)	1.22	14.36
Perfluorooctanoic Acid (PFOA)	1.22	14.36
Perfluoropentane sulfonic acid (PFPeS)	NA	NA
Perfluoropentanoic Acid (PFPeA)	NA	NA
Perfluorotetradecanoic acid (PFTeDA)	NA	NA
Perfluorotridecanoic acid (PFTrDA)	NA	NA
Perfluoroundecanoic acid (PFUnA)	NA	NA

TABLE 4.0-6
SUMMARY OF VERMONT GROUNDWATER ENFORCEMENT STANDARDS
NON-RADIOLOGICAL SITE INVESTIGATION
VERMONT YANKEE NUCLEAR POWER STATION
VERNON, VERMONT

Volatile Organic Compounds (ug/L)	VT ANR Proposed 2019 Groundwater Enforcement Standard
1,1-Dichloroethane	70
1,2,4-Trimethylbenzene	23
1,3,5-Trimethylbenzene	23
2-Butanone (Methyl Ethyl Ketone)	511
2-Phenylbutane (sec-Butylbenzene)	NA
Acetone	950
Bromodichloromethane	NA
Chloroform (Trichloromethane)	NA
cis-1,2-Dichloroethene	70
Cymene (p-Isopropyltoluene)	NA
Dibromochloromethane	NA
Dichlorodifluoromethane (CFC-12)	NA
Ethylbenzene	700
Isopropylbenzene (Cumene)	NA
m,p-Xylenes	NA
Naphthalene	0.5
n-Butylbenzene	NA
n-Propylbenzene	NA
Trichloroethene	5
Xylene (total)	10000
Semi-Volatile Organic Compounds (ug/L)	**VT ANR Proposed 2019 Groundwater Enforcement Standard**
Acenaphthene	NA
Anthracene	343
bis(2-Ethylhexyl)phthalate	6
Butyl benzylphthalate	NA
Diethyl phthalate	NA
Dimethyl phthalate	NA
Di-n-butylphthalate	NA
Fluoranthene	46
Fluorene	46
Naphthalene	0.5
Phenanthrene	NA
Pyrene	NA
Total Petroleum Hydrocarbons (ug/L)	**VT ANR Proposed 2019 Groundwater Enforcement Standard**
Total Petroleum Hydrocarbons (C10-C28) DRO	NA
Total Petroleum Hydrocarbons (C6-C10) GRO	NA

TABLE 4.0-6
SUMMARY OF VERMONT GROUNDWATER ENFORCEMENT STANDARDS
NON-RADIOLOGICAL SITE INVESTIGATION
VERMONT YANKEE NUCLEAR POWER STATION
VERNON, VERMONT

Inorganic Compounds (ug/L)	VT ANR Proposed 2019 Groundwater Enforcement Standard
Phosphorus, Dissolved	NA
Aluminum, Total	NA
Antimony, Total	NA
Arsenic, Total	10
Barium, Total	2000
Beryllium, Total	4
Cadmium, Total	5
Calcium, Total	NA
Chromium, Total	100
Cobalt, Total	NA
Copper, Total	1300
Iron, Total	NA
Lead, Total	15
Magnesium, Total	NA
Manganese, Total	300
Mercury, Total	NA
Nickel, Total	100
Potassium, Total	NA
Selenium, Total	50
Silver, Total	NA
Sodium, Total	NA
Thallium, Total	2
Vanadium, Total	NA
Zinc, Total	NA
PCBs (ug/L)	**VT ANR Proposed 2019 Groundwater Enforcement Standard**
Aroclor-1016 (PCB-1016)	NA
Aroclor-1221 (PCB-1221)	NA
Aroclor-1232 (PCB-1232)	NA
Aroclor-1242 (PCB-1242)	NA
Aroclor-1248 (PCB-1248)	NA
Aroclor-1254 (PCB-1254)	NA
Aroclor-1260 (PCB-1260)	NA
Aroclor-1262 (PCB-1262)	NA
Aroclor-1268 (PCB-1268)	NA
Other	**VT ANR Proposed 2019 Groundwater Enforcement Standard**
Escherichia coli, Total (colf/100mL)	NA
pH (lab), Total (pH units)	NA
Chloride, Total (ug/L)	NA
Nitrate (as N), Total (ug/L)	10000
Dioxins/Furans (ug/L)	**VT ANR Proposed 2019 Groundwater Enforcement Standard**
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	3.00E-05

TABLE 4.0-6
SUMMARY OF VERMONT GROUNDWATER ENFORCEMENT STANDARDS
NON-RADIOLOGICAL SITE INVESTIGATION
VERMONT YANKEE NUCLEAR POWER STATION
VERNON, VERMONT

Field Parameters	VT ANR Proposed 2019 Groundwater Enforcement Standard
Temperature (Deg C)	NA
Conductivity, Field (mS/cm)	NA
ORP, Field (mv)	NA
Turbidity, Field (NTU)	NA
pH, Field (pH units)	NA
Dissolved Oxygen, Field (ug/L)	NA
Herbicides (ug/L)	**VT ANR Proposed 2019 Groundwater Enforcement Standard**
2,4,5-T	70
2,4,5-TP (Silvex)	50
2,4-Dichlorophenoxyacetic acid (2,4-D)	70
Pesticides (ug/L)	**VT ANR Proposed 2019 Groundwater Enforcement Standard**
4,4'-DDD	NA
4,4'-DDE	NA
4,4'-DDT	NA
Aldrin	0.1
alpha-BHC	NA
alpha-Chlordane	NA
beta-BHC	NA
delta-BHC	NA
Dieldrin	0.02
Endosulfan I	NA
Endosulfan II	NA
Endosulfan sulfate	NA
Endrin	2
Endrin aldehyde	NA
Endrin ketone	NA
gamma-BHC (Lindane)	0.2
gamma-Chlordane	NA
Heptachlor	0.4
Heptachlor epoxide	0.2
Methoxychlor	40
Toxaphene	3

TABLE 4.0-6
SUMMARY OF VERMONT GROUNDWATER ENFORCEMENT STANDARDS
NON-RADIOLOGICAL SITE INVESTIGATION
VERMONT YANKEE NUCLEAR POWER STATION
VERNON, VERMONT

PFAS (ug/L)	VT ANR Proposed 2019 Groundwater Enforcement Standard
Fluorotelomer sulfonic acid (4:2 FTSA)	NA
Fluorotelomer sulfonic acid (6:2 FTSA)	NA
Fluorotelomer sulfonic acid (8:2 FTSA)	NA
N-ethyl perfluorooctane sulfonamidoacetic acid (N-EtFOSAA)	NA
N-methyl perfluorooctane sulfonamidoacetic acid (N-MeFOSAA)	NA
Perfluorobutanesulfonic Acid (PFBS)	NA
Perfluorobutanoic Acid (PFBA)	NA
Perfluorodecane sulfonic Acid (PFDS)	NA
Perfluorodecanoic acid (PFDA)	NA
Perfluorododecanoic acid (PFDoDA)	NA
Perfluoroheptane sulfonic acid (PFHpS)	NA
Perfluoroheptanoic acid (PFHpA)*	0.02
Perfluorohexanesulfonic acid (PFHxS)*	0.02
Perfluorohexanoic acid (PFHxA)	NA
Perfluorononane sulfonic acid (PFNS)	NA
Perfluorononanoic Acid (PFNA)*	0.02
Perfluorooctane sulfonamide (FOSA)	NA
Perfluorooctanesulfonic acid (PFOS)*	0.02
Perfluorooctanoic Acid (PFOA)*	0.02
Perfluoropentane sulfonic acid (PFPeS)	NA
Perfluoropentanoic Acid (PFPeA)	NA
Perfluorotetradecanoic acid (PFTeDA)	NA
Perfluorotridecanoic acid (PFTrDA)	NA
Perfluoroundecanoic acid (PFUnA)	NA

TABLE 4.0-7
SUMMARY OF VERMONT RECOMMENDED SEDIMENT QUALITY GUIDELINES
NON-RADIOLOGICAL SITE INVESTIGATION
VERMONT YANKEE NUCLEAR POWER STATION
VERNON, VERMONT

Volatile Organic Compounds (mg/kg)	VT ANR Recommended Sediment Quality Guidelines (freshwater ecosystems)		VT ANR 2019 Proposed Residential Soil	VT ANR 2019 Proposed Non-Residential Soil
	Threshold Effect Concentration	Probable Effects Concentration		
Acetone	NA	NA	40609	100028

Semi-Volatile Organic Compounds (mg/kg)	VT ANR Recommended Sediment Quality Guidelines (freshwater ecosystems)		VT ANR 2019 Proposed Residential Soil	VT ANR 2019 Proposed Non-Residential Soil
	Threshold Effect Concentration	Probable Effects Concentration		
Benzo(a)anthracene	0.108	1.05	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA
bis(2-Ethylhexyl)phthalate	NA	NA	20	120
Chrysene	0.166	1.29	NA	NA
Fluoranthene	0.423	2.23	2301	26371
Pyrene	0.195	1.52	NA	NA
Total PAHs	1.61	22.8	NA	NA
Benzo(a)Pyrene Equivalent (ND = 0 RL)	NA	NA	0.07	1.54
Benzo(a)Pyrene Equivalent (ND = 1/2 RL)	NA	NA	0.07	1.54
Benzo(a)Pyrene Equivalent (ND = RL)	NA	NA	0.07	1.54

Total Petroleum Hydrocarbons (mg/kg)	VT ANR Recommended Sediment Quality Guidelines (freshwater ecosystems)		VT ANR 2019 Proposed Residential Soil	VT ANR 2019 Proposed Non-Residential Soil
	Threshold Effect Concentration	Probable Effects Concentration		
Total Petroleum Hydrocarbons (C10-C28) DRO	NA	NA	NA	NA
Total Petroleum Hydrocarbons (C6-C10) GRO	NA		NA	NA

Inorganic Compounds (mg/kg)	VT ANR Recommended Sediment Quality Guidelines (freshwater ecosystems)		VT ANR 2019 Proposed Residential Soil	VT ANR 2019 Proposed Non-Residential Soil
	Threshold Effect Concentration	Probable Effects Concentration		
Aluminum	NA	NA	72507	941748
Arsenic	9.79	33	16	16
Barium	NA	NA	11247	127382
Cadmium	0.99	4.98	6.9	87
Calcium	NA	NA	NA	NA
Chromium	43.4	111	NA	NA
Cobalt	NA	NA	22	291
Copper	31.6	149	10407	139231
Iron	NA	NA	51302	686351
Lead	35.8	128	400	800
Magnesium	NA	NA	NA	NA
Manganese	NA	NA	1118	11350
Nickel	22.7	48.6	940	9707
Potassium	NA	NA	NA	NA
Vanadium	NA	NA	2.8	27
Zinc	121	459	21986	294150

TABLE 4.0-7
SUMMARY OF VERMONT RECOMMENDED SEDIMENT QUALITY GUIDELINES
NON-RADIOLOGICAL SITE INVESTIGATION
VERMONT YANKEE NUCLEAR POWER STATION
VERNON, VERMONT

	VT ANR Recommended Sediment Quality Guidelines (freshwater ecosystems)		VT ANR 2019 Proposed Residential Soil	VT ANR 2019 Proposed Non-Residential Soil
PCBs (mg/kg)	**Threshold Effect Concentration**	**Probable Effects Concentration**		
Aroclor-1016 (PCB-1016)	NA	NA	NA	NA
Aroclor-1221 (PCB-1221)	NA	NA	NA	NA
Aroclor-1232 (PCB-1232)	NA	NA	NA	NA
Aroclor-1242 (PCB-1242)	NA	NA	NA	NA
Aroclor-1248 (PCB-1248)	NA	NA	NA	NA
Aroclor-1254 (PCB-1254)	NA	NA	NA	NA
Aroclor-1260 (PCB-1260)	NA	NA	NA	NA
Aroclor-1262 (PCB-1262)	NA	NA	NA	NA
Aroclor-1268 (PCB-1268)	NA	NA	NA	NA

	VT ANR Recommended Sediment Quality Guidelines (freshwater ecosystems)		VT ANR 2019 Proposed Residential Soil	VT ANR 2019 Proposed Non-Residential Soil
Other	**Threshold Effect Concentration**	**Probable Effects Concentration**		
Total Solids (%)	NA	NA	NA	NA

	VT ANR Recommended Sediment Quality Guidelines (freshwater ecosystems)		VT ANR 2019 Proposed Residential Soil	VT ANR 2019 Proposed Non-Residential Soil
Dioxins/Furans (pg/g)	**Threshold Effect Concentration**	**Probable Effects Concentration**		
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	NA	NA	NA	NA
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	NA	NA	NA	NA
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	NA	NA	NA	NA
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	NA	NA	NA	NA
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	NA	NA	NA	NA
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	NA	NA	NA	NA
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	NA	NA	NA	NA
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	NA	NA	NA	NA
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	NA	NA	NA	NA
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	NA	NA	NA	NA
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	NA	NA	NA	NA
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	NA	NA	NA	NA
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	NA	NA	NA	NA
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	NA	NA	2.25	13.7
Total Heptachlorodibenzofuran (HpCDF)	NA	NA	NA	NA
Total Heptachlorodibenzo-p-dioxin (HpCDD)	NA	NA	NA	NA
Total Hexachlorodibenzofuran (HxCDF)	NA	NA	NA	NA
Total Hexachlorodibenzo-p-dioxin (HxCDD), Mixture	NA	NA	NA	NA
Total Pentachlorodibenzofuran (PeCDF)	NA	NA	NA	NA
Total Pentachlorodibenzo-p-dioxin (PeCDD)	NA	NA	NA	NA
Total Tetrachlorodibenzofuran (TCDF)	NA	NA	NA	NA
Total Tetrachlorodibenzo-p-dioxin (TCDD)	NA	NA	NA	NA

TABLE 4.0-7
SUMMARY OF VERMONT RECOMMENDED SEDIMENT QUALITY GUIDELINES
NON-RADIOLOGICAL SITE INVESTIGATION
VERMONT YANKEE NUCLEAR POWER STATION
VERNON, VERMONT

	VT ANR Recommended Sediment Quality Guidelines (freshwater ecosystems)		VT ANR 2019 Proposed Residential Soil	VT ANR 2019 Proposed Non-Residential Soil
Herbicides (mg/kg)	**Threshold Effect Concentration**	**Probable Effects Concentration**		
2,4,5-T	NA	NA	NA	NA
2,4,5-TP (Silvex)	NA	NA	NA	NA
2,4-Dichlorophenoxyacetic acid (2,4-D)	NA	NA	NA	NA
Dalapon	NA	NA	NA	NA
Dichloroprop	NA	NA	NA	NA
Dinoseb	NA	NA	NA	NA

	VT ANR Recommended Sediment Quality Guidelines (freshwater ecosystems)		VT ANR 2019 Proposed Residential Soil	VT ANR 2019 Proposed Non-Residential Soil
Pesticides (mg/kg)	**Threshold Effect Concentration**	**Probable Effects Concentration**		
4,4'-DDD	0.00488	0.028	NA	NA
4,4'-DDE	0.00316	0.0313	NA	NA
4,4'-DDT	0.00416	0.028	NA	NA
Aldrin	NA	NA	0.02	0.1
alpha-BHC	NA	NA	NA	NA
alpha-Chlordane	NA	NA	NA	NA
beta-BHC	NA	NA	NA	NA
delta-BHC	NA	NA	NA	NA
Dieldrin	NA	NA	NA	NA
Endosulfan I	NA	NA	NA	NA
Endosulfan II	NA	NA	NA	NA
Endosulfan sulfate	NA	NA	NA	NA
Endrin	0.00222	0.207	NA	NA
Endrin aldehyde	NA	NA	NA	NA
Endrin ketone	NA	NA	NA	NA
gamma-BHC (Lindane)	0.00237	0.00499	NA	NA
gamma-Chlordane	NA	NA	NA	NA
Heptachlor	NA	NA	NA	NA
Heptachlor epoxide	0.00247	0.016	NA	NA
Methoxychlor	NA	NA	NA	NA
Toxaphene	NA	NA	NA	NA

TABLE 5.1-1
AOC 1 - 345 KV SWITCHYARD: SOIL ANALYTICAL RESULTS COMPARED TO RESIDENTIAL AND NON-RESIDENTIAL SOIL CRITERIA
VERMONT YANKEE
VERNON, VERMONT

Location Name Sample Name Sample Date Lab Sample ID Sample Depth (bgs)	VT ANR 2019 Proposed Residential Soil	VT ANR 2019 Proposed Non-Residential Soil	USEPA RSL Residential Soil HI = 1.0 May 2019	USEPA RSL Industrial Soil HI = 1.0 May 2019	DP0101 DP010101 04/30/2019 JC87266-1 0 - 1 (ft)	DP0101 DP010118 04/30/2019 JC87266-2 18 - 20 (ft)
Volatile Organic Compounds (mg/kg)						
1,1,1,2-Tetrachloroethane	1.3	8	2	8.8	0.0027 U	0.0019 U
1,1,1-Trichloroethane	NA	NA	8100	36000	0.0027 U	0.0019 U
1,1,2,2-Tetrachloroethane	NA	NA	0.6	2.7	0.0027 U	0.0019 U
1,1,2-Trichloroethane	NA	NA	1.1	5	0.0027 U	0.0019 U
1,1-Dichloroethane	2.1	13	3.6	16	0.0013 U	0.00094 U
1,1-Dichloroethene	NA	NA	230	1000	0.0013 U	0.00094 U
1,1-Dichloropropene	NA	NA	NA	NA	0.0027 U	0.0019 U
1,2,3-Trichlorobenzene	NA	NA	63	930	0.0067 U	0.0047 U
1,2,3-Trichloropropane	0.00311	0.07	0.0051	0.11	**0.0067 U**	**0.0047 U**
1,2,4-Trichlorobenzene	NA	NA	24	110	0.0067 U	0.0047 U
1,2,4-Trimethylbenzene	144	177	300	1800	0.0027 U	0.0019 U
1,2-Dibromo-3-chloropropane (DBCP)	0.01	0.06	0.0053	0.064	0.0027 U	0.0019 U
1,2-Dibromoethane (Ethylene Dibromide)	0.02	0.14	0.036	0.16	0.0013 U	0.00094 U
1,2-Dichlorobenzene	NA	NA	1800	9300	0.0013 U	0.00094 U
1,2-Dichloroethane	0.29	1.7	0.46	2	0.0013 U	0.00094 U
1,2-Dichloropropane	1.5	9.1	2.5	11	0.0027 U	0.0019 U
1,3,5-Trimethylbenzene	144	177	270	1500	0.0027 U	0.0019 U
1,3-Dichlorobenzene	NA	NA	NA	NA	0.0013 U	0.00094 U
1,3-Dichloropropane	NA	NA	1600	23000	0.0027 U	0.0019 U
1,4-Dichlorobenzene	NA	NA	2.6	11	0.0013 U	0.00094 U
2,2-Dichloropropane	NA	NA	NA	NA	0.0027 U	0.0019 U
2-Butanone (Methyl Ethyl Ketone)	16952	26991	27000	190000	0.013 U	0.0094 U
2-Chlorotoluene	NA	NA	1600	23000	0.0027 U	0.0019 U
2-Phenylbutane (sec-Butylbenzene)	7009	102200	7800	120000	0.0027 U	0.0019 U
4-Chlorotoluene	NA	NA	1600	23000	0.0027 U	0.0019 U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	NA	NA	33000	140000	0.0067 U	0.0047 U
Acetone	40609	100028	61000	670000	0.0272 U	0.0094 U
Benzene	0.7	4.2	1.2	5.1	0.00067 U	0.00047 U
Bromobenzene	NA	NA	290	1800	0.0067 U	0.0047 U
Bromodichloromethane	NA	NA	0.29	1.3	0.0027 U	0.0019 U
Bromoform	NA	NA	19	86	0.0067 U	0.0047 U
Bromomethane (Methyl Bromide)	NA	NA	6.8	30	0.0067 U	0.0047 U
Carbon tetrachloride	0.37	2.2	0.65	2.9	0.0027 U	0.0019 U
Chlorobenzene	414	726	280	1300	0.0027 U	0.0019 U
Chlorobromomethane	193	597	150	630	0.0067 U	0.0047 U
Chloroethane	NA	NA	14000	57000	0.0067 U	0.0047 U
Chloroform (Trichloromethane)	NA	NA	0.32	1.4	0.0027 U	0.0019 U
Chloromethane (Methyl Chloride)	NA	NA	110	460	0.0067 U	0.0047 U
cis-1,2-Dichloroethene	140	1814	160	2300	0.0013 U	0.00094 U
cis-1,3-Dichloropropene	NA	NA	NA	NA	0.0027 U	0.0019 U
Cymene (p-Isopropyltoluene)	NA	NA	NA	NA	0.0027 U	0.0019 U
Dibromochloromethane	NA	NA	8.3	39	0.0027 U	0.0019 U
Dibromomethane	NA	NA	24	99	0.0067 U	0.0047 U
Dichlorodifluoromethane (CFC-12)	NA	NA	87	370	0.0067 U	0.0047 U
Ethylbenzene	3.7	22	5.8	25	0.0013 U	0.00094 U
Hexachlorobutadiene	NA	NA	1.2	5.3	0.0067 U	0.0047 U
Isopropylbenzene (Cumene)	256	264	1900	9900	0.0027 U	0.0019 U
m,p-Xylenes	NA	NA	NA	NA	0.0013 U	0.00094 U
Methyl Tert Butyl Ether	649	4464	47	210	0.0013 U	0.00094 U
Methylene chloride	NA	NA	57	1000	0.0067 U	0.0047 U
Naphthalene	2.7	16	3.8	17	0.0067 U	0.0047 U
n-Butylbenzene	3504	51100	3900	58000	0.0027 U	0.0019 U
n-Propylbenzene	253	261	3800	24000	0.0027 U	0.0019 U
o-Xylene	NA	NA	650	2800	0.0013 U	0.00094 U
Styrene	NA	NA	6000	35000	0.0027 U	0.0019 U
tert-Butylbenzene	7009	102200	7800	120000	0.0027 U	0.0019 U
Tetrachloroethene	2.4	14	24	100	0.0027 U	0.0019 U
Toluene	706	798	4900	47000	0.0013 U	0.00094 U
trans-1,2-Dichloroethene	1402	18137	1600	23000	0.0013 U	0.00094 U
trans-1,3-Dichloropropene	NA	NA	NA	NA	0.0027 U	0.0019 U
Trichloroethene	0.68	6.5	0.94	6	0.0013 U	0.00094 U
Trichlorofluoromethane (CFC-11)	NA	NA	23000	350000	0.0067 U	0.0047 U
Vinyl chloride	0.1	0.59	0.059	1.7	0.0027 U	0.0019 U
Xylene (total)	252	257	580	2500	0.0013 U	0.00094 U

TABLE 5.1-1
AOC 1 - 345 KV SWITCHYARD: SOIL ANALYTICAL RESULTS COMPARED TO RESIDENTIAL AND NON-RESIDENTIAL SOIL CRITERIA
VERMONT YANKEE
VERNON, VERMONT

Location Name Sample Name Sample Date Lab Sample ID Sample Depth (bgs)	VT ANR 2019 Proposed Residential Soil	VT ANR 2019 Proposed Non-Residential Soil	USEPA RSL Residential Soil HI = 1.0 May 2019	USEPA RSL Industrial Soil HI = 1.0 May 2019	DP0101 DP010101 04/30/2019 JC87266-1 0 - 1 (ft)	DP0101 DP010118 04/30/2019 JC87266-2 18 - 20 (ft)
Semi-Volatile Organic Compounds (mg/kg)						
Acenaphthene	NA	NA	3600	45000	0.036 U	0.034 U
Acenaphthylene	NA	NA	NA	NA	0.036 U	0.034 U
Anthracene	NA	NA	18000	230000	0.036 U	0.034 U
Benzo(a)anthracene	NA	NA	1.1	21	0.036 U	0.034 U
Benzo(a)pyrene	0.07	1.54	0.11	2.1	0.036 U	0.034 U
Benzo(b)fluoranthene	NA	NA	1.1	21	0.036 U	0.034 U
Benzo(g,h,i)perylene	NA	NA	NA	NA	0.036 U	0.034 U
Benzo(k)fluoranthene	NA	NA	11	210	0.036 U	0.034 U
Chrysene	NA	NA	110	2100	0.036 U	0.034 U
Dibenz(a,h)anthracene	NA	NA	0.11	2.1	0.036 U	0.034 U
Fluoranthene	2301	26371	2400	30000	0.036 U	0.034 U
Fluorene	2301	26371	2400	30000	0.036 U	0.034 U
Indeno(1,2,3-cd)pyrene	NA	NA	1.1	21	0.036 U	0.034 U
Naphthalene	2.7	16	3.8	17	0.036 U	0.034 U
Phenanthrene	NA	NA	NA	NA	0.036 U	0.034 U
Pyrene	NA	NA	1800	23000	0.036 U	0.034 U
Benzo(a)Pyrene Equivalent (ND = 0 RL)	0.07	1.54	NA	NA	ND	ND
Benzo(a)Pyrene Equivalent (ND = 1/2 RL)	0.07	1.54	NA	NA	ND	ND
Total Petroleum Hydrocarbons (mg/kg)						
Total Petroleum Hydrocarbons (C10-C28) DRO	NA	NA	NA	NA	11 U	10 U
Total Petroleum Hydrocarbons (C6-C10) GRO	NA	NA	NA	NA	33 U	26 U
Inorganic Compounds (mg/kg)						
Aluminum	72507	941748	77000	1.10E+06	9830	5420
Antimony	26	319	31	470	2.2 U	2.1 U
Arsenic	16	16	0.68	3	3.9	4
Barium	11247	127382	15000	220000	31	21 U
Beryllium	35	289	160	2300	0.41	0.21 U
Cadmium	6.9	87	71	980	0.55 U	0.51 U
Calcium	NA	NA	NA	NA	1750	1150
Chromium	NA	NA	NA	NA	17.7	12.4
Cobalt	22	291	23	350	7.5	5.9
Copper	10407	139231	3100	47000	13.7	5.1
Iron	51302	686351	55000	820000	16700	12300
Lead	400	800	400	800	5.6	3.6
Magnesium	NA	NA	NA	NA	4320	2810
Manganese	1118	11350	1800	26000	343	171
Mercury	3.1	3.1	11	46	0.033 U	0.032 U
Nickel	940	9707	1500	22000	19.5	12.8
Potassium	NA	NA	NA	NA	1120	1000 U
Selenium	366	4900	390	5800	2.2 U	2.1 U
Silver	237	2483	390	5800	0.55 U	0.51 U
Sodium	NA	NA	NA	NA	1100 U	1000 U
Thallium	0.73	196100	0.78	12	**1.1 U**	**1 U**
Vanadium	2.8	27	390	5800	**20.9**	**13.5**
Zinc	21986	294150	23000	350000	39	21.8

TABLE 5.1-1
AOC 1 - 345 KV SWITCHYARD: SOIL ANALYTICAL RESULTS COMPARED TO RESIDENTIAL AND NON-RESIDENTIAL SOIL CRITERIA
VERMONT YANKEE
VERNON, VERMONT

Location Name Sample Name Sample Date Lab Sample ID Sample Depth (bgs)	VT ANR 2019 Proposed Residential Soil	VT ANR 2019 Proposed Non-Residential Soil	USEPA RSL Residential Soil HI = 1.0 May 2019	USEPA RSL Industrial Soil HI = 1.0 May 2019	DP0101 DP010101 04/30/2019 JC87266-1 0 - 1 (ft)	DP0101 DP010118 04/30/2019 JC87266-2 18 - 20 (ft)
PCBs (mg/kg)						
Aroclor-1016 (PCB-1016)	NA	NA	4.1	27	0.036 U	0.034 U
Aroclor-1221 (PCB-1221)	NA	NA	0.2	0.83	0.036 U	0.034 U
Aroclor-1232 (PCB-1232)	NA	NA	0.17	0.72	0.036 U	0.034 U
Aroclor-1242 (PCB-1242)	NA	NA	0.23	0.95	0.036 U	0.034 U
Aroclor-1248 (PCB-1248)	NA	NA	0.23	0.95	0.036 U	0.034 U
Aroclor-1254 (PCB-1254)	NA	NA	0.24	0.97	0.036 U	0.034 U
Aroclor-1260 (PCB-1260)	NA	NA	0.24	0.99	0.036 U	0.034 U
Aroclor-1262 (PCB-1262)	NA	NA	NA	NA	0.036 U	0.034 U
Aroclor-1268 (PCB-1268)	NA	NA	NA	NA	0.036 U	0.034 U
SUM of PCBs	NA	NA	0.23	0.94	ND	ND
Other						
Total Solids (%)	NA	NA	NA	NA	88.9	94.6

ABBREVIATIONS AND NOTES:
-: Not Analyzed
*: Outside of QC limits
J: value is estimated
mg/kg: milligram per kilogram
NA: Not Applicable
RSL: Risk-Based Screening Levels
U: Not detected, value is the laboratory reporting limit
VT ANR: Vermont Agency of Natural Resources
USEPA: United State Environmental Protection Agency

- Volatile and Semi-Volatile analytes detected in at least one sample are reported herein. For a complete list of analytes see the laboratory data sheets.
- Bold values indicate an exceedance of the Proposed 2019 VT ANR Residential Soil values and the USEPA May 2019 Residential Soil RSL where no VT ANR value is available.
- Italicized values indicate an exceedance of the Proposed 2019 VT ANR Non-Residential Soil values and the USEPA May 2019 Industrial Soil RSL where no VT ANR value is available.

TABLE 5.3-1
AOC 3 - FORMER SOUTH WAREHOUSE: SOIL ANALYTICAL RESULTS COMPARED TO RESIDENTIAL AND NON-RESIDENTIAL SOIL CRITERIA
VERMONT YANKEE
VERNON, VERMONT

Location Name Sample Name Sample Date Lab Sample ID Sample Depth (bgs)	VT ANR 2019 Proposed Residential Soil	VT ANR 2019 Proposed Non-Residential Soil	USEPA RSL Residential Soil HI = 1.0 May 2019	USEPA RSL Industrial Soil HI = 1.0 May 2019	DP0301 DP030101 05/02/2019 JC87450-5 0 - 1 (ft)	DP0301 DP030118 05/02/2019 JC87450-6 18 - 20 (ft)	DP0302 DP030201 05/02/2019 JC87450-13 0 - 2 (ft)	DP0302 DP030220 05/02/2019 JC87450-14 20 - 22 (ft)	DP0303 DP030301 05/02/2019 JC87450-16 0 - 1 (ft)	DP0303 DP030301DUP 05/02/2019 JC87450-17 0 - 1 (ft)	DP0304 DP030401 05/02/2019 JC87563-2 0 - 1 (ft)	DP0304 DP030418 05/02/2019 JC87563-1 18 - 20 (ft)
Volatile Organic Compounds (mg/kg)												
1,1,1,2-Tetrachloroethane	1.3	8	2	8.8	0.0016 U	0.0029 U	0.0018 U	0.0018 U	0.0024 U	0.0021 U	0.002 U	0.0021 U
1,1,1-Trichloroethane	NA	NA	8100	36000	0.0016 U	0.0029 U	0.0018 U	0.0018 U	0.0024 U	0.0021 U	0.002 U	0.0021 U
1,1,2,2-Tetrachloroethane	NA	NA	0.6	2.7	0.0016 U	0.0029 U	0.0018 U	0.0018 U	0.0024 U	0.0021 U	0.002 U	0.0021 U
1,1,2-Trichloroethane	NA	NA	1.1	5	0.0016 U	0.0029 U	0.0018 U	0.0018 U	0.0024 U	0.0021 U	0.002 U	0.0021 U
1,1-Dichloroethane	2.1	13	3.6	16	0.00082 U	0.0014 U	0.00092 U	0.00092 U	0.0012 U	0.001 U	0.001 U	0.001 U
1,1-Dichloroethene	NA	NA	230	1000	0.00082 U	0.0014 U	0.00092 U	0.00092 U	0.0012 U	0.001 U	0.001 U	0.001 U
1,1-Dichloropropene	NA	NA	NA	NA	0.0016 U	0.0029 U	0.0018 U	0.0018 U	0.0024 U	0.0021 U	0.002 U	0.0021 U
1,2,3-Trichlorobenzene	NA	NA	63	930	0.0041 U	0.0072 U	0.0046 U	0.0046 U	0.0059 U	0.0052 U	0.0051 U	0.0052 U
1,2,3-Trichloropropane	0.00311	0.07	0.0051	0.11	**0.0041 U**	**0.0072 U**	**0.0046 U**	**0.0046 U**	**0.0059 U**	**0.0052 U**	**0.0051 U**	**0.0052 U**
1,2,4-Trichlorobenzene	NA	NA	24	110	0.0041 U	0.0072 U	0.0046 U	0.0046 U	0.0059 U	0.0052 U	0.0051 U	0.0052 U
1,2,4-Trimethylbenzene	144	177	300	1800	0.0016 U	0.0029 U	0.0018 U	0.0018 U	0.0024 U	0.0021 U	0.002 U	0.0021 U
1,2-Dibromo-3-chloropropane (DBCP)	0.01	0.06	0.0053	0.064	0.0016 U	0.0029 U	0.0018 U	0.0018 U	0.0024 U	0.0021 U	0.002 U	0.0021 U
1,2-Dibromoethane (Ethylene Dibromide)	0.02	0.14	0.036	0.16	0.00082 U	0.0014 U	0.00092 U	0.00092 U	0.0012 U	0.001 U	0.001 U	0.001 U
1,2-Dichlorobenzene	NA	NA	1800	9300	0.00082 U	0.0014 U	0.00092 U	0.00092 U	0.0012 U	0.001 U	0.001 U	0.001 U
1,2-Dichloroethane	0.29	1.7	0.46	2	0.00082 U	0.0014 U	0.00092 U	0.00092 U	0.0012 U	0.001 U	0.001 U	0.001 U
1,2-Dichloropropane	1.5	9.1	2.5	11	0.0016 U	0.0029 U	0.0018 U	0.0018 U	0.0024 U	0.0021 U	0.002 U	0.0021 U
1,3,5-Trimethylbenzene	144	177	270	1500	0.0016 U	0.0029 U	0.0018 U	0.0018 U	0.0024 U	0.0021 U	0.002 U	0.0021 U
1,3-Dichlorobenzene	NA	NA	NA	NA	0.00082 U	0.0014 U	0.00092 U	0.00092 U	0.0012 U	0.001 U	0.001 U	0.001 U
1,3-Dichloropropane	NA	NA	1600	23000	0.0016 U	0.0029 U	0.0018 U	0.0018 U	0.0024 U	0.0021 U	0.002 U	0.0021 U
1,4-Dichlorobenzene	NA	NA	2.6	11	0.00082 U	0.0014 U	0.00092 U	0.00092 U	0.0012 U	0.001 U	0.001 U	0.001 U
2,2-Dichloropropane	NA	NA	NA	NA	0.0016 U	0.0029 U	0.0018 U	0.0018 U	0.0024 U	0.0021 U	0.002 U	0.0021 U
2-Butanone (Methyl Ethyl Ketone)	16952	26991	27000	190000	0.0082 U	0.014 U	0.0092 U	0.0092 U	0.012 U	0.01 U	0.01 U	0.01 U
2-Chlorotoluene	NA	NA	1600	23000	0.0016 U	0.0029 U	0.0018 U	0.0018 U	0.0024 U	0.0021 U	0.002 U	0.0021 U
2-Phenylbutane (sec-Butylbenzene)	7009	102200	7800	120000	0.0016 U	0.0029 U	0.0018 U	0.0018 U	0.0024 U	0.0021 U	0.002 U	0.0021 U
4-Chlorotoluene	NA	NA	1600	23000	0.0016 U	0.0029 U	0.0018 U	0.0018 U	0.0024 U	0.0021 U	0.002 U	0.0021 U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	NA	NA	33000	140000	0.0041 U	0.0072 U	0.0046 U	0.0046 U	0.0059 U	0.0052 U	0.0051 U	0.0052 U
Acetone	40609	100028	61000	670000	0.0082 U	0.0377	0.0092 U	0.0092 U	0.012 U	0.01 U	0.01 U	0.0203 J+
Benzene	0.7	4.2	1.2	5.1	0.00041 U	0.00089	0.00046 U	0.00046 U	0.00059 U	0.00052 U	0.00051 U	0.00052 U
Bromobenzene	NA	NA	290	1800	0.0041 U	0.0072 U	0.0046 U	0.0046 U	0.0059 U	0.0052 U	0.0051 U	0.0052 U
Bromodichloromethane	NA	NA	0.29	1.3	0.0016 U	0.0029 U	0.0018 U	0.0018 U	0.0024 U	0.0021 U	0.002 U	0.0021 U
Bromoform	NA	NA	19	86	0.0041 U	0.0072 U	0.0046 U	0.0046 U	0.0059 U	0.0052 U	0.0051 U	0.0052 U
Bromomethane (Methyl Bromide)	NA	NA	6.8	30	0.0041 U	0.0072 U	0.0046 U	0.0046 U	0.0059 U	0.0052 U	0.0051 U	0.0052 U
Carbon tetrachloride	0.37	2.2	0.65	2.9	0.0016 U	0.0029 U	0.0018 U	0.0018 U	0.0024 U	0.0021 U	0.002 U	0.0021 U
Chlorobenzene	414	726	280	1300	0.0016 U	0.0029 U	0.0018 U	0.0018 U	0.0024 U	0.0021 U	0.002 U	0.0021 U
Chlorobromomethane	193	597	150	630	0.0041 U	0.0072 U	0.0046 U	0.0046 U	0.0059 U	0.0052 U	0.0051 U	0.0052 U
Chloroethane	NA	NA	14000	57000	0.0041 U	0.0072 U	0.0046 U	0.0046 U	0.0059 U	0.0052 U	0.0051 U	0.0052 U
Chloroform (Trichloromethane)	NA	NA	0.32	1.4	0.0016 U	0.0029 U	0.0018 U	0.0018 U	0.0024 U	0.0021 U	0.002 U	0.0021 U
Chloromethane (Methyl Chloride)	NA	NA	110	460	0.0041 U	0.0072 U	0.0046 U	0.0046 U	0.0059 U	0.0052 U	0.0051 U	0.0052 U
cis-1,2-Dichloroethene	140	1814	160	2300	0.00082 U	0.0014 U	0.00092 U	0.00092 U	0.0012 U	0.001 U	0.001 U	0.001 U
cis-1,3-Dichloropropene	NA	NA	NA	NA	0.0016 U	0.0029 U	0.0018 U	0.0018 U	0.0024 U	0.0021 U	0.002 U	0.0021 U
Cymene (p-Isopropyltoluene)	NA	NA	NA	NA	0.0016 U	0.0029 U	0.0018 U	0.0018 U	0.0024 U	0.0021 U	0.002 U	0.0021 U
Dibromochloromethane	NA	NA	8.3	39	0.0016 U	0.0029 U	0.0018 U	0.0018 U	0.0024 U	0.0021 U	0.002 U	0.0021 U
Dibromomethane	NA	NA	24	99	0.0041 U	0.0072 U	0.0046 U	0.0046 U	0.0059 U	0.0052 U	0.0051 U	0.0052 U
Dichlorodifluoromethane (CFC-12)	NA	NA	87	370	0.0041 U	0.0072 U	0.0046 U	0.0046 U	0.0059 U	0.0052 U	0.0051 U	0.0052 U
Ethylbenzene	3.7	22	5.8	25	0.00082 U	0.0014 U	0.00092 U	0.00092 U	0.0012 U	0.001 U	0.001 U	0.001 U
Hexachlorobutadiene	NA	NA	1.2	5.3	0.0041 U	0.0072 U	0.0046 U	0.0046 U	0.0059 U	0.0052 U	0.0051 U	0.0052 U

TABLE 5.3-1
AOC 3 - FORMER SOUTH WAREHOUSE: SOIL ANALYTICAL RESULTS COMPARED TO RESIDENTIAL AND NON-RESIDENTIAL SOIL CRITERIA
VERMONT YANKEE
VERNON, VERMONT

Location Name Sample Name Sample Date Lab Sample ID Sample Depth (bgs)	VT ANR 2019 Proposed Residential Soil	VT ANR 2019 Proposed Non-Residential Soil	USEPA RSL Residential Soil HI = 1.0 May 2019	USEPA RSL Industrial Soil HI = 1.0 May 2019	DP0301 DP030101 05/02/2019 JC87450-5 0 - 1 (ft)	DP0301 DP030118 05/02/2019 JC87450-6 18 - 20 (ft)	DP0302 DP030201 05/02/2019 JC87450-13 0 - 2 (ft)	DP0302 DP030220 05/02/2019 JC87450-14 20 - 22 (ft)	DP0303 DP030301 05/02/2019 JC87450-16 0 - 1 (ft)	DP0303 DP030301DUP 05/02/2019 JC87450-17 0 - 1 (ft)	DP0304 DP030401 05/02/2019 JC87563-2 0 - 1 (ft)	DP0304 DP030418 05/02/2019 JC87563-1 18 - 20 (ft)
Volatile Organic Compounds (mg/kg) *(Continued)*												
Isopropylbenzene (Cumene)	256	264	1900	9900	0.0016 U	0.0029 U	0.0018 U	0.0018 U	0.0024 U	0.0021 U	0.002 U	0.0021 U
m,p-Xylenes	NA	NA	NA	NA	0.00082 U	0.0014 U	0.00092 U	0.00092 U	0.0012 U	0.001 U	0.001 U	0.001 U
Methyl Tert Butyl Ether	649	4464	47	210	0.00082 U	0.0014 U	0.00092 U	0.00092 U	0.0012 U	0.001 U	0.001 U	0.001 U
Methylene chloride	NA	NA	57	1000	0.0041 U	0.0072 U	0.0046 U	0.0046 U	0.0059 U	0.0052 U	0.0051 U	0.0019 J
Naphthalene	2.7	16	3.8	17	0.0041 U	0.0072 U	0.0046 U	0.0046 U	0.0059 U	0.0052 U	0.0051 U	0.0052 U
n-Butylbenzene	3504	51100	3900	58000	0.0016 U	0.0029 U	0.0018 U	0.0018 U	0.0024 U	0.0021 U	0.002 U	0.0021 U
n-Propylbenzene	253	261	3800	24000	0.0016 U	0.0029 U	0.0018 U	0.0018 U	0.0024 U	0.0021 U	0.002 U	0.0021 U
o-Xylene	NA	NA	650	2800	0.00082 U	0.0014 U	0.00092 U	0.00092 U	0.0012 U	0.001 U	0.001 U	0.001 U
Styrene	NA	NA	6000	35000	0.0016 U	0.0029 U	0.0018 U	0.0018 U	0.0024 U	0.0021 U	0.002 U	0.0021 U
tert-Butylbenzene	7009	102200	7800	120000	0.0016 U	0.0029 U	0.0018 U	0.0018 U	0.0024 U	0.0021 U	0.002 U	0.0021 U
Tetrachloroethene	2.4	14	24	100	0.0016 U	0.0029 U	0.0018 U	0.0018 U	0.0024 U	0.0021 U	0.002 U	0.0021 U
Toluene	706	798	4900	47000	0.00082 U	0.0014 U	0.00092 U	0.00092 U	0.0012 U	0.001 U	0.001 U	0.001 U
trans-1,2-Dichloroethene	1402	18137	1600	23000	0.00082 U	0.0014 U	0.00092 U	0.00092 U	0.0012 U	0.001 U	0.001 U	0.001 U
trans-1,3-Dichloropropene	NA	NA	NA	NA	0.0016 U	0.0029 U	0.0018 U	0.0018 U	0.0024 U	0.0021 U	0.002 U	0.0021 U
Trichloroethene	0.68	6.5	0.94	6	0.00082 U	0.0014 U	0.00092 U	0.00092 U	0.0012 U	0.001 U	0.001 U	0.001 U
Trichlorofluoromethane (CFC-11)	NA	NA	23000	350000	0.0041 U	0.0072 U	0.0042 J	0.0046 U	0.0059 U	0.0052 U	0.0051 U	0.0052 U
Vinyl chloride	0.1	0.59	0.059	1.7	0.0016 U	0.0029 U	0.0018 U	0.0018 U	0.0024 U	0.0021 U	0.002 U	0.0021 U
Xylene (total)	252	257	580	2500	0.00082 U	0.0014 U	0.00092 U	0.00092 U	0.0012 U	0.001 U	0.001 U	0.001 U
Semi-Volatile Organic Compounds (mg/kg)												
1,2,4-Trichlorobenzene	NA	NA	24	110	-	-	0.071 U	0.073 U	0.073 U	0.075 U	-	-
1,2-Dichlorobenzene	NA	NA	1800	9300	-	-	0.071 U	0.073 U	0.073 U	0.075 U	-	-
1,2-Diphenylhydrazine	NA	NA	0.68	2.9	-	-	0.071 U	0.073 U	0.073 U	0.075 U	-	-
1,3-Dichlorobenzene	NA	NA	NA	NA	-	-	0.071 U	0.073 U	0.073 U	0.075 U	-	-
1,4-Dichlorobenzene	NA	NA	2.6	11	-	-	0.071 U	0.073 U	0.073 U	0.075 U	-	-
1-Methylnaphthalene	NA	NA	18	73	-	-	0.035 U	0.037 U	0.037 U	0.038 U	-	-
2,2'-oxybis(1-Chloropropane)	2804	36274	3100	47000	-	-	0.071 U	0.073 U	0.073 U	0.075 U	-	-
2,4,5-Trichlorophenol	NA	NA	6300	82000	-	-	0.18 U	0.18 U	0.18 U	0.19 U	-	-
2,4,6-Trichlorophenol	NA	NA	49	210	-	-	0.18 U	0.18 U	0.18 U	0.19 U	-	-
2,4-Dichlorophenol	NA	NA	190	2500	-	-	0.18 U	0.18 U	0.18 U	0.19 U	-	-
2,4-Dimethylphenol	NA	NA	1300	16000	-	-	0.18 U	0.18 U	0.18 U	0.19 U	-	-
2,4-Dinitrophenol	NA	NA	130	1600	-	-	0.18 U	0.18 U	0.18 U	0.19 U	-	-
2,4-Dinitrotoluene	NA	NA	1.7	7.4	-	-	0.035 U	0.037 U	0.037 U	0.038 U	-	-
2,6-Dinitrotoluene	NA	NA	0.36	1.5	-	-	0.035 U	0.037 U	0.037 U	0.038 U	-	-
2-Chloronaphthalene	NA	NA	4800	60000	-	-	0.071 U	0.073 U	0.073 U	0.075 U	-	-
2-Chlorophenol	NA	NA	390	5800	-	-	0.071 U	0.073 U	0.073 U	0.075 U	-	-
2-Methylnaphthalene	NA	NA	240	3000	-	-	0.035 U	0.037 U	0.037 U	0.038 U	-	-
2-Methylphenol (o-Cresol)	NA	NA	3200	41000	-	-	0.071 U	0.073 U	0.073 U	0.075 U	-	-
2-Nitroaniline	NA	NA	630	8000	-	-	0.18 U	0.18 U	0.18 U	0.19 U	-	-
2-Nitrophenol	NA	NA	NA	NA	-	-	0.18 U	0.18 U	0.18 U	0.19 U	-	-
3&4-Methylphenol	NA	NA	NA	NA	-	-	0.071 U	0.073 U	0.073 U	0.075 U	-	-
3,3'-Dichlorobenzidine	NA	NA	1.2	5.1	-	-	0.071 U	0.073 U	0.073 U	0.075 U	-	-
3-Nitroaniline	NA	NA	NA	NA	-	-	0.18 U	0.18 U	0.18 U	0.19 U	-	-
4,6-Dinitro-2-methylphenol	NA	NA	5.1	66	-	-	0.18 U	0.18 U	0.18 U	0.19 U	-	-
4-Bromophenyl phenyl ether	NA	NA	NA	NA	-	-	0.071 U	0.073 U	0.073 U	0.075 U	-	-
4-Chloro-3-methylphenol	NA	NA	6300	82000	-	-	0.18 U	0.18 U	0.18 U	0.19 U	-	-
4-Chloroaniline	NA	NA	2.7	11	-	-	0.18 U	0.18 U	0.18 U	0.19 U	-	-
4-Chlorophenyl phenyl ether	NA	NA	NA	NA	-	-	0.071 U	0.073 U	0.073 U	0.075 U	-	-
4-Nitroaniline	NA	NA	27	110	-	-	0.18 U	0.18 U	0.18 U	0.19 U	-	-
4-Nitrophenol	NA	NA	NA	NA	-	-	0.35 U	0.37 U	0.37 U	0.38 U	-	-

TABLE 5.3-1
AOC 3 - FORMER SOUTH WAREHOUSE: SOIL ANALYTICAL RESULTS COMPARED TO RESIDENTIAL AND NON-RESIDENTIAL SOIL CRITERIA
VERMONT YANKEE
VERNON, VERMONT

Location Name Sample Name Sample Date Lab Sample ID Sample Depth (bgs)	VT ANR 2019 Proposed Residential Soil	VT ANR 2019 Proposed Non-Residential Soil	USEPA RSL Residential Soil HI = 1.0 May 2019	USEPA RSL Industrial Soil HI = 1.0 May 2019	DP0301 DP030101 05/02/2019 JC87450-5 0 - 1 (ft)	DP0301 DP030118 05/02/2019 JC87450-6 18 - 20 (ft)	DP0302 DP030201 05/02/2019 JC87450-13 0 - 2 (ft)	DP0302 DP030220 05/02/2019 JC87450-14 20 - 22 (ft)	DP0303 DP030301 05/02/2019 JC87450-16 0 - 1 (ft)	DP0303 DP030301DUP 05/02/2019 JC87450-17 0 - 1 (ft)	DP0304 DP030401 05/02/2019 JC87563-2 0 - 1 (ft)	DP0304 DP030418 05/02/2019 JC87563-1 18 - 20 (ft)
Semi-Volatile Organic Compounds (mg/kg) ***(Continued)***												
Acenaphthene	NA	NA	3600	45000	0.036 U	0.04 U	0.035 U	0.037 U	0.0191 J	0.0438	0.039 U	0.036 U
Acenaphthylene	NA	NA	NA	NA	0.036 U	0.04 U	0.035 U	0.037 U	0.037 U	0.038 U	0.039 U	0.036 U
Aniline	NA	NA	95	400	-	-	0.071 U	0.073 U	0.073 U	0.075 U	-	-
Anthracene	NA	NA	18000	230000	0.036 U	0.04 U	0.035 U	0.037 U	0.0469	0.106	0.0377 J	0.036 U
Benzidine	NA	NA	0.00053	0.01	-	-	***0.35 U***	***0.37 U***	***0.37 U***	***0.38 U***	-	-
Benzo(a)anthracene	NA	NA	1.1	21	0.036 U	0.04 U	0.035 U	0.037 U	0.164	0.353	0.046	0.036 U
Benzo(a)pyrene	0.07	1.54	0.11	2.1	0.036 U	0.04 U	0.035 U	0.037 U	**0.125**	**0.228**	0.0249 J	0.036 U
Benzo(b)fluoranthene	NA	NA	1.1	21	0.036 U	0.04 U	0.035 U	0.037 U	0.164	0.311	0.0464	0.036 U
Benzo(g,h,i)perylene	NA	NA	NA	NA	0.036 U	0.04 U	0.035 U	0.037 U	0.0695	0.108	0.039 U	0.036 U
Benzo(k)fluoranthene	NA	NA	11	210	0.036 U	0.04 U	0.035 U	0.037 U	0.0665	0.122	0.0203 J	0.036 U
Benzoic acid	NA	NA	250000	3.30E+06	-	-	0.71 U	0.73 U	0.73 U	0.75 U	-	-
Benzyl Alcohol	NA	NA	6300	82000	-	-	0.071 U	0.073 U	0.073 U	0.075 U	-	-
bis(2-Chloroethoxy)methane	NA	NA	190	2500	-	-	0.071 U	0.073 U	0.073 U	0.075 U	-	-
bis(2-Chloroethyl)ether	NA	NA	0.23	1	-	-	0.071 U	0.073 U	0.073 U	0.075 U	-	-
bis(2-Ethylhexyl)phthalate	20	120	39	160	-	-	0.071 U	0.073 U	0.0558 J	0.057 J	-	-
Butyl benzylphthalate	NA	NA	290	1200	-	-	0.071 U	0.073 U	0.073 U	0.075 U	-	-
Carbazole	NA	NA	NA	NA	-	-	0.071 U	0.073 U	0.0173 J	0.0405 J	-	-
Chrysene	NA	NA	110	2100	0.036 U	0.04 U	0.035 U	0.037 U	0.16	0.327	0.0503	0.036 U
Dibenz(a,h)anthracene	NA	NA	0.11	2.1	0.036 U	0.04 U	0.035 U	0.037 U	0.037 U	0.0271 J	0.039 U	0.036 U
Dibenzofuran	NA	NA	73	1000	-	-	0.071 U	0.073 U	0.073 U	0.075 U	-	-
Diethyl phthalate	NA	NA	51000	660000	-	-	0.071 U	0.073 U	0.073 U	0.075 U	-	-
Dimethyl phthalate	NA	NA	NA	NA	-	-	0.071 U	0.073 U	0.073 U	0.075 U	-	-
Di-n-butylphthalate	NA	NA	6300	82000	-	-	0.071 U	0.073 U	0.073 U	0.075 U	-	-
Di-n-octyl phthalate	NA	NA	630	8200	-	-	0.071 U	0.073 U	0.073 U	0.075 U	-	-
Fluoranthene	2301	26371	2400	30000	0.036 U	0.04 U	0.035 U	0.037 U	0.37 J	0.903 J	0.214	0.036 U
Fluorene	2301	26371	2400	30000	0.036 U	0.04 U	0.035 U	0.037 U	0.037 U	0.0217 J	0.039 U	0.036 U
Hexachlorobenzene	0.13	0.69	0.21	0.96	-	-	0.071 U	0.073 U	0.073 U	0.075 U	-	-
Hexachlorobutadiene	NA	NA	1.2	5.3	-	-	0.035 U	0.037 U	0.037 U	0.038 U	-	-
Hexachlorocyclopentadiene	NA	NA	1.8	7.5	-	-	0.35 U	0.37 U	0.37 U	0.38 U	-	-
Hexachloroethane	NA	NA	1.8	8	-	-	0.18 U	0.18 U	0.18 U	0.19 U	-	-
Indeno(1,2,3-cd)pyrene	NA	NA	1.1	21	0.036 U	0.04 U	0.035 U	0.037 U	0.0922	0.143	0.039 U	0.036 U
Isophorone	NA	NA	570	2400	-	-	0.071 U	0.073 U	0.073 U	0.075 U	-	-
Naphthalene	2.7	16	3.8	17	0.036 U	0.04 U	0.035 U	0.037 U	0.037 U	0.0168 J	0.029 J	0.036 U
Nitrobenzene	NA	NA	5.1	22	-	-	0.071 U	0.073 U	0.073 U	0.075 U	-	-
N-Nitrosodimethylamine	NA	NA	0.002	0.034	-	-	***0.071 U***	***0.073 U***	***0.073 U***	***0.075 U***	-	-
N-Nitrosodi-n-propylamine	NA	NA	0.078	0.33	-	-	0.071 U	0.073 U	0.073 U	0.075 U	-	-
N-Nitrosodiphenylamine	NA	NA	110	470	-	-	0.18 U	0.18 U	0.18 U	0.19 U	-	-
Pentachlorophenol	0.48	2.9	1	4	-	-	0.14 U	0.15 U	0.15 U	0.15 U	-	-
Phenanthrene	NA	NA	NA	NA	0.036 U	0.04 U	0.035 U	0.037 U	0.192 J	0.422 J	0.0306 J	0.036 U
Phenol	NA	NA	19000	250000	-	-	0.071 U	0.073 U	0.073 U	0.075 U	-	-
Pyrene	NA	NA	1800	23000	0.036 U	0.04 U	0.035 U	0.037 U	0.331 J	0.786 J	0.15	0.036 U
Pyridine	NA	NA	78	1200	-	-	0.071 U	0.073 U	0.073 U	0.075 U	-	-
Benzo(a)Pyrene Equivalent (ND = 0 RL)	0.07	1.54	NA	NA	ND	ND	ND	ND	**0.17**	**0.34**	0.034	ND
Benzo(a)Pyrene Equivalent (ND = 1/2 RL)	0.07	1.54	NA	NA	ND	ND	ND	ND	**0.19**	**0.34**	0.056	ND
Total Petroleum Hydrocarbons (mg/kg)												
Total Petroleum Hydrocarbons (C10-C28) DRO	NA	NA	NA	NA	11 U	27.3	43.6	11 U	11 U	11 U	10 U	9.8 U
Total Petroleum Hydrocarbons (C6-C10) GRO	NA	NA	NA	NA	21 U	20.5 J	22 U	22 U	29 U	240 U	24 U	24 U

TABLE 5.3-1
AOC 3 - FORMER SOUTH WAREHOUSE: SOIL ANALYTICAL RESULTS COMPARED TO RESIDENTIAL AND NON-RESIDENTIAL SOIL CRITERIA
VERMONT YANKEE
VERNON, VERMONT

Location Name Sample Name Sample Date Lab Sample ID Sample Depth (bgs)	VT ANR 2019 Proposed Residential Soil	VT ANR 2019 Proposed Non-Residential Soil	USEPA RSL Residential Soil HI = 1.0 May 2019	USEPA RSL Industrial Soil HI = 1.0 May 2019	DP0301 DP030101 05/02/2019 JC87450-5 0 - 1 (ft)	DP0301 DP030118 05/02/2019 JC87450-6 18 - 20 (ft)	DP0302 DP030201 05/02/2019 JC87450-13 0 - 2 (ft)	DP0302 DP030220 05/02/2019 JC87450-14 20 - 22 (ft)	DP0303 DP030301 05/02/2019 JC87450-16 0 - 1 (ft)	DP0303 DP030301DUP 05/02/2019 JC87450-17 0 - 1 (ft)	DP0304 DP030401 05/02/2019 JC87563-2 0 - 1 (ft)	DP0304 DP030418 05/02/2019 JC87563-1 18 - 20 (ft)
Inorganic Compounds (mg/kg)												
Aluminum	72507	941748	77000	1.10E+06	8490 J+	18700 J+	7670 J+	5410 J+	9870 J+	9940 J+	13300 J+	5520 J+
Antimony	26	319	31	470	2.3 UJ	2.5 UJ	2.2 UJ	2.3 UJ	2.2 UJ	2.3 UJ	2.5 UJ	2.2 UJ
Arsenic	16	16	0.68	3	7	4.9	3.6	3	5.8	5.6	5.4	8.4
Barium	11247	127382	15000	220000	25.9	81.7	26.9	23 U	37	33.1	33.2	22 U
Beryllium	35	289	160	2300	0.23 U	0.54	0.22 U	0.23 U	0.31	0.27	0.34	0.22 U
Cadmium	6.9	87	71	980	0.59 U	0.63 U	0.54 U	0.59 U	0.56 U	0.58 U	0.63 U	0.55 U
Calcium	NA	NA	NA	NA	1080	1560	1420	1110	1620	1390	1840	625
Chromium	NA	NA	NA	NA	15	28.7	16.8	11.4	19.5	18.4	23.7	10.1
Cobalt	22	291	23	350	7	9.7	6.4	5.9 U	8.5	7.6	9.3	5.5 U
Copper	10407	139231	3100	47000	13.1	15	11.9	5.4	18.5	17.5	21.6	5.2
Iron	51302	686351	55000	820000	17400	20700	13700	12500	18500	18300	20000	14300
Lead	400	800	400	800	7.5	10.8	7.5	2.8	12.3	10.5	8.8	2.7
Magnesium	NA	NA	NA	NA	3910	5720	3440	2760	4520	4240	5420	2780
Manganese	1118	11350	1800	26000	360	514	334	213	366	432	458	153
Mercury	3.1	3.1	11	46	0.033 U	0.038 U	0.035 U	0.035 U	0.036 U	0.037 U	0.039 U	0.035 U
Nickel	940	9707	1500	22000	20.1	27	17.2	12.8	21.1	19.9	24.2	10.7
Potassium	NA	NA	NA	NA	1200 U	1300 U	1100 U	1200 U	1100	1200 U	1300 U	1100 U
Selenium	366	4900	390	5800	2.3 U	2.5 U	2.2 U	2.3 U	2.2 U	2.3 U	2.5 U	2.2 U
Silver	237	2483	390	5800	0.59 U	0.63 U	0.54 U	0.59 U	0.56 U	0.58 U	0.63 U	0.55 U
Sodium	NA	NA	NA	NA	1200 U	1300 U	1100 U	1200 U	1100 U	1200 U	1300 U	1100 U
Thallium	0.73	196100	0.78	12	**1.2 U**	**1.3 U**	**1.1 U**	**1.2 U**	**1.1 U**	**1.2 U**	**1.3 U**	**1.1 U**
Vanadium	2.8	27	390	5800	**16.1**	***29.2***	**17.6**	**15.3**	**21.8**	**20.5**	**25.9**	**11.7**
Zinc	21986	294150	23000	350000	42.7	95.8	39	23.6	130	119	70.7	21.4
PCBs (mg/kg)												
Aroclor-1016 (PCB-1016)	NA	NA	4.1	27	-	-	0.037 U	0.036 U	-	-	-	-
Aroclor-1221 (PCB-1221)	NA	NA	0.2	0.83	-	-	0.037 U	0.036 U	-	-	-	-
Aroclor-1232 (PCB-1232)	NA	NA	0.17	0.72	-	-	0.037 U	0.036 U	-	-	-	-
Aroclor-1242 (PCB-1242)	NA	NA	0.23	0.95	-	-	0.037 U	0.036 U	-	-	-	-
Aroclor-1248 (PCB-1248)	NA	NA	0.23	0.95	-	-	0.037 U	0.036 U	-	-	-	-
Aroclor-1254 (PCB-1254)	NA	NA	0.24	0.97	-	-	0.037 U	0.036 U	-	-	-	-
Aroclor-1260 (PCB-1260)	NA	NA	0.24	0.99	-	-	0.037 U	0.036 U	-	-	-	-
Aroclor-1262 (PCB-1262)	NA	NA	NA	NA	-	-	0.037 U	0.036 U	-	-	-	-
Aroclor-1268 (PCB-1268)	NA	NA	NA	NA	-	-	0.037 U	0.036 U	-	-	-	-
SUM of PCBs	NA	NA	0.23	0.94	-	-	ND	ND	-	-	-	-
Other												
Total Solids (%)	NA	NA	NA	NA	89.6	80.4	90.3	86.1	86.4	86.6	83 J	89 J

ABBREVIATIONS AND NOTES:
-: Not Analyzed
*: Outside of QC limits
J: value is estimated
mg/kg: milligram per kilogram
NA: Not Applicable
RSL: Risk-Based Screening Levels
U: Not detected, value is the laboratory reporting limit
VT ANR: Vermont Agency of Natural Resources
USEPA: United State Environmental Protection Agency

- Volatile and Semi-Volatile analytes detected in at least one sample are reported herein. For a complete list of analytes see the laboratory data sheets.
- Bold values indicate an exceedance of the Proposed 2019 VT ANR Residential Soil values and the USEPA May 2019 Residential Soil RSL where no VT ANR value is available.
- Italicized values indicate an exceedance of the Proposed 2019 VT ANR Non-Residential Soil values and the USEPA May 2019 Industrial Soil RSL where no VT ANR value is available.

TABLE 5.5-1
AOC 5 - TURBINE BUILDING: SOIL ANALYTICAL RESULTS COMPARED TO RESIDENTIAL AND NON-RESIDENTIAL SOIL CRITERIA
VERMONT YANKEE
VERNON, VERMONT

Location Name Sample Name Sample Date Lab Sample ID Sample Depth (bgs)	VT ANR 2019 Proposed Residential Soil	VT ANR 2019 Proposed Non-Residential Soil	USEPA RSL Residential Soil HI = 1.0 May 2019	USEPA RSL Industrial Soil HI = 1.0 May 2019	DP0501 DP050101 05/03/2019 JC87563-11 0 - 1 (ft)	DP0501 DP050120 05/03/2019 JC87563-12 20 - 22 (ft)	DP0502 DP050201 05/03/2019 JC87563-7 0 - 1 (ft)	DP0502 DP050201 DUP 05/03/2019 JC87563-8 0 - 1 (ft)	DP0502 DP050218 05/03/2019 JC87563-9 18 - 20 (ft)	DP0503 DP050301 05/03/2019 JC87563-13 0 - 1 (ft)	DP0503 DP050317 05/03/2019 JC87563-14 17 - 19 (ft)	DP0504 DP050401 05/03/2019 JC87563-5 0 - 1 (ft)	DP0504 DP050416 05/03/2019 JC87563-6 16 - 18 (ft)
Volatile Organic Compounds (mg/kg)													
1,1,1,2-Tetrachloroethane	1.3	8	2	8.8	0.0021 U	0.0019 U	0.0021 U	0.0021 U	0.18 U	0.002 U	0.0016 U	0.0021 U	0.0021 U
1,1,1-Trichloroethane	NA	NA	8100	36000	0.0021 U	0.0019 U	0.0021 U	0.0021 U	0.18 U	0.002 U	0.0016 U	0.0021 U	0.0021 U
1,1,2,2-Tetrachloroethane	NA	NA	0.6	2.7	0.0021 U	0.0019 U	0.0021 U	0.0021 U	0.18 U	0.002 U	0.0016 U	0.0021 U	0.0021 U
1,1,2-Trichloroethane	NA	NA	1.1	5	0.0021 U	0.0019 U	0.0021 U	0.0021 U	0.18 U	0.002 U	0.0016 U	0.0021 U	0.0021 U
1,1-Dichloroethane	2.1	13	3.6	16	0.0011 U	0.00097 U	0.0011 U	0.0011 U	0.092 U	0.001 U	0.00079 U	0.001 U	0.001 U
1,1-Dichloroethene	NA	NA	230	1000	0.0011 U	0.00097 U	0.0011 U	0.0011 U	0.092 U	0.001 U	0.00079 U	0.001 U	0.001 U
1,1-Dichloropropene	NA	NA	NA	NA	0.0021 U	0.0019 U	0.0021 U	0.0021 U	0.18 U	0.002 U	0.0016 U	0.0021 U	0.0021 U
1,2,3-Trichlorobenzene	NA	NA	63	930	0.0053 U	0.0049 U	0.0053 U	0.0053 U	0.46 U	0.005 U	0.004 U	0.0052 U	0.0051 U
1,2,3-Trichloropropane	0.00311	0.07	0.0051	0.11	**0.0053 U**	**0.0049 U**	**0.0053 U**	**0.0053 U**	***0.46 U***	**0.005 U**	**0.004 U**	**0.0052 U**	**0.0051 U**
1,2,4-Trichlorobenzene	NA	NA	24	110	0.0053 U	0.0049 U	0.0053 U	0.0053 U	0.46 U	0.005 U	0.004 U	0.0052 U	0.0051 U
1,2,4-Trimethylbenzene	144	177	300	1800	0.0021 U	0.0019 U	0.0021 U	0.0021 U	12	0.002 U	0.0016 U	0.0021 U	0.0021 U
1,2-Dibromo-3-chloropropane (DBCP)	0.01	0.06	0.0053	0.064	0.0021 U	0.0019 U	0.0021 U	0.0021 U	***0.18 U***	0.002 U	0.0016 U	0.0021 U	0.0021 U
1,2-Dibromoethane (Ethylene Dibromide)	0.02	0.14	0.036	0.16	0.0011 U	0.00097 U	0.0011 U	0.0011 U	**0.092 U**	0.001 U	0.00079 U	0.001 U	0.001 U
1,2-Dichlorobenzene	NA	NA	1800	9300	0.0011 U	0.00097 U	0.0011 U	0.0011 U	0.092 U	0.001 U	0.00079 U	0.001 U	0.001 U
1,2-Dichloroethane	0.29	1.7	0.46	2	0.0011 U	0.00097 U	0.0011 U	0.0011 U	0.092 U	0.001 U	0.00079 U	0.001 U	0.001 U
1,2-Dichloropropane	1.5	9.1	2.5	11	0.0021 U	0.0019 U	0.0021 U	0.0021 U	0.18 U	0.002 U	0.0016 U	0.0021 U	0.0021 U
1,3,5-Trimethylbenzene	144	177	270	1500	0.0021 U	0.0019 U	0.0021 U	0.0021 U	4.95	0.002 U	0.0016 U	0.0021 U	0.0021 U
1,3-Dichlorobenzene	NA	NA	NA	NA	0.0011 U	0.00097 U	0.0011 U	0.0011 U	0.092 U	0.001 U	0.00079 U	0.001 U	0.001 U
1,3-Dichloropropane	NA	NA	1600	23000	0.0021 U	0.0019 U	0.0021 U	0.0021 U	0.18 U	0.002 U	0.0016 U	0.0021 U	0.0021 U
1,4-Dichlorobenzene	NA	NA	2.6	11	0.0011 U	0.00097 U	0.0011 U	0.0011 U	0.092 U	0.001 U	0.00079 U	0.001 U	0.001 U
2,2-Dichloropropane	NA	NA	NA	NA	0.0021 U	0.0019 U	0.0021 U	0.0021 U	0.18 U	0.002 U	0.0016 U	0.0021 U	0.0021 U
2-Butanone (Methyl Ethyl Ketone)	16952	26991	27000	190000	0.011 U	0.0097 U	0.011 U	0.011 U	0.92 U	0.01 U	0.0079 U	0.01 U	0.01 U
2-Chlorotoluene	NA	NA	1600	23000	0.0021 U	0.0019 U	0.0021 U	0.0021 U	0.18 U	0.002 U	0.0016 U	0.0021 U	0.0021 U
2-Phenylbutane (sec-Butylbenzene)	7009	102200	7800	120000	0.0021 U	0.0019 U	0.0021 U	0.0021 U	1.24	0.002 U	0.0016 U	0.0021 U	0.0021 U
4-Chlorotoluene	NA	NA	1600	23000	0.0021 U	0.0019 U	0.0021 U	0.0021 U	0.18 U	0.002 U	0.0016 U	0.0021 U	0.0021 U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	NA	NA	33000	140000	0.0053 U	0.0049 U	0.0053 U	0.0053 U	0.46 U	0.005 U	0.004 U	0.0052 U	0.0051 U
Acetone	40609	100028	61000	670000	0.011 U	0.0198 J+	0.011 U	0.011 U	0.92 U	0.01 U	0.027 J+	0.01 U	0.01 U
Benzene	0.7	4.2	1.2	5.1	0.00053 U	0.00049 U	0.00053 U	0.00053 U	0.046 U	0.0005 U	0.0004 U	0.00052 U	0.00051 U
Bromobenzene	NA	NA	290	1800	0.0053 U	0.0049 U	0.0053 U	0.0053 U	0.46 U	0.005 U	0.004 U	0.0052 U	0.0051 U
Bromodichloromethane	NA	NA	0.29	1.3	0.0021 U	0.0019 U	0.0021 U	0.0021 U	0.18 U	0.002 U	0.0016 U	0.0021 U	0.0021 U
Bromoform	NA	NA	19	86	0.0053 U	0.0049 U	0.0053 U	0.0053 U	0.46 U	0.005 U	0.004 U	0.0052 U	0.0051 U
Bromomethane (Methyl Bromide)	NA	NA	6.8	30	0.0053 U	0.0049 U	0.0053 U	0.0053 U	0.46 U	0.005 U	0.004 U	0.0052 U	0.0051 U
Carbon tetrachloride	0.37	2.2	0.65	2.9	0.0021 U	0.0019 U	0.0021 U	0.0021 U	0.18 U	0.002 U	0.0016 U	0.0021 U	0.0021 U
Chlorobenzene	414	726	280	1300	0.0021 U	0.0019 U	0.0021 U	0.0021 U	0.18 U	0.002 U	0.0016 U	0.0021 U	0.0021 U
Chlorobromomethane	193	597	150	630	0.0053 U	0.0049 U	0.0053 U	0.0053 U	0.46 U	0.005 U	0.004 U	0.0052 U	0.0051 U
Chloroethane	NA	NA	14000	57000	0.0053 U	0.0049 U	0.0053 U	0.0053 U	0.46 U	0.005 U	0.004 U	0.0052 U	0.0051 U
Chloroform (Trichloromethane)	NA	NA	0.32	1.4	0.0021 U	0.0019 U	0.0021 U	0.0021 U	0.18 U	0.002 U	0.0016 U	0.0021 U	0.0021 U
Chloromethane (Methyl Chloride)	NA	NA	110	460	0.0053 U	0.0049 U	0.0053 U	0.0053 U	0.46 U	0.005 U	0.004 U	0.0052 U	0.0051 U
cis-1,2-Dichloroethene	140	1814	160	2300	0.0011 U	0.00097 U	0.0011 U	0.0011 U	0.092 U	0.001 U	0.00079 U	0.001 U	0.001 U
cis-1,3-Dichloropropene	NA	NA	NA	NA	0.0021 U	0.0019 U	0.0021 U	0.0021 U	0.18 U	0.002 U	0.0016 U	0.0021 U	0.0021 U
Cymene (p-Isopropyltoluene)	NA	NA	NA	NA	0.0021 U	0.0019 U	0.0021 U	0.0021 U	1.3	0.002 U	0.0016 U	0.0021 U	0.0021 U
Dibromochloromethane	NA	NA	8.3	39	0.0021 U	0.0019 U	0.0021 U	0.0021 U	0.18 U	0.002 U	0.0016 U	0.0021 U	0.0021 U
Dibromomethane	NA	NA	24	99	0.0053 U	0.0049 U	0.0053 U	0.0053 U	0.46 U	0.005 U	0.004 U	0.0052 U	0.0051 U
Dichlorodifluoromethane (CFC-12)	NA	NA	87	370	0.0053 U	0.0049 U	0.0053 U	0.0053 U	0.46 U	0.005 U	0.004 U	0.0052 U	0.0051 U
Ethylbenzene	3.7	22	5.8	25	0.0011 U	0.00097 U	0.0011 U	0.0011 U	0.256	0.001 U	0.00079 U	0.001 U	0.001 U

TABLE 5.5-1
AOC 5 - TURBINE BUILDING: SOIL ANALYTICAL RESULTS COMPARED TO RESIDENTIAL AND NON-RESIDENTIAL SOIL CRITERIA
VERMONT YANKEE
VERNON, VERMONT

Location Name Sample Name Sample Date Lab Sample ID Sample Depth (bgs)	VT ANR 2019 Proposed Residential Soil	VT ANR 2019 Proposed Non-Residential Soil	USEPA RSL Residential Soil HI = 1.0 May 2019	USEPA RSL Industrial Soil HI = 1.0 May 2019	DP0501 DP050101 05/03/2019 JC87563-11 0 - 1 (ft)	DP0501 DP050120 05/03/2019 JC87563-12 20 - 22 (ft)	DP0502 DP050201 05/03/2019 JC87563-7 0 - 1 (ft)	DP0502 DP050201 DUP 05/03/2019 JC87563-8 0 - 1 (ft)	DP0502 DP050218 05/03/2019 JC87563-9 18 - 20 (ft)	DP0503 DP050301 05/03/2019 JC87563-13 0 - 1 (ft)	DP0503 DP050317 05/03/2019 JC87563-14 17 - 19 (ft)	DP0504 DP050401 05/03/2019 JC87563-5 0 - 1 (ft)	DP0504 DP050416 05/03/2019 JC87563-6 16 - 18 (ft)
Volatile Organic Compounds (mg/kg) ***(Continued)***													
Hexachlorobutadiene	NA	NA	1.2	5.3	0.0053 U	0.0049 U	0.0053 U	0.0053 U	0.46 U	0.005 U	0.004 U	0.0052 U	0.0051 U
Isopropylbenzene (Cumene)	256	264	1900	9900	0.0021 U	0.0019 U	0.0021 U	0.0021 U	0.502	0.002 U	0.0016 U	0.0021 U	0.0021 U
m,p-Xylenes	NA	NA	NA	NA	0.0011 U	0.00097 U	0.0011 U	0.0011 U	0.243	0.001 U	0.00079 U	0.001 U	0.001 U
Methyl Tert Butyl Ether	649	4464	47	210	0.0011 U	0.00097 U	0.0011 U	0.0011 U	0.092 U	0.001 U	0.00079 U	0.001 U	0.001 U
Methylene chloride	NA	NA	57	1000	0.0053 U	0.0014 J	0.0053 U	0.0053 U	0.46 U	0.005 U	0.0015 J	0.0052 U	0.0051 U
Naphthalene	2.7	16	3.8	17	0.0053 U	0.0049 U	0.0053 U	0.0053 U	**5.99**	0.005 U	0.004 U	0.0052 U	0.0051 U
n-Butylbenzene	3504	51100	3900	58000	0.0021 U	0.0019 U	0.0021 U	0.0021 U	1.08	0.002 U	0.0016 U	0.0021 U	0.0021 U
n-Propylbenzene	253	261	3800	24000	0.0021 U	0.0019 U	0.0021 U	0.0021 U	1.49	0.002 U	0.0016 U	0.0021 U	0.0021 U
o-Xylene	NA	NA	650	2800	0.0011 U	0.00097 U	0.0011 U	0.0011 U	0.092 U	0.001 U	0.00079 U	0.001 U	0.001 U
Styrene	NA	NA	6000	35000	0.0021 U	0.0019 U	0.0021 U	0.0021 U	0.18 U	0.002 U	0.0016 U	0.0021 U	0.0021 U
tert-Butylbenzene	7009	102200	7800	120000	0.0021 U	0.0019 U	0.0021 U	0.0021 U	0.247	0.002 U	0.0016 U	0.0021 U	0.0021 U
Tetrachloroethene	2.4	14	24	100	0.0021 U	0.0019 U	0.0021 U	0.0021 U	0.18 U	0.002 U	0.0016 U	0.0021 U	0.0021 U
Toluene	706	798	4900	47000	0.0011 U	0.00097 U	0.0011 U	0.0011 U	0.092 U	0.001 U	0.00079 U	0.001 U	0.001 U
trans-1,2-Dichloroethene	1402	18137	1600	23000	0.0011 U	0.00097 U	0.0011 U	0.0011 U	0.092 U	0.001 U	0.00079 U	0.001 U	0.001 U
trans-1,3-Dichloropropene	NA	NA	NA	NA	0.0021 U	0.0019 U	0.0021 U	0.0021 U	0.18 U	0.002 U	0.0016 U	0.0021 U	0.0021 U
Trichloroethene	0.68	6.5	0.94	6	0.0011 U	0.00097 U	0.0011 U	0.0011 U	0.092 U	0.001 U	0.00079 U	0.001 U	0.001 U
Trichlorofluoromethane (CFC-11)	NA	NA	23000	350000	0.0053 U	0.0049 U	0.0053 U	0.0053 U	0.46 U	0.005 U	0.004 U	0.0052 U	0.0051 U
Vinyl chloride	0.1	0.59	0.059	1.7	0.0021 U	0.0019 U	0.0021 U	0.0021 U	**0.18 U**	0.002 U	0.0016 U	0.0021 U	0.0021 U
Xylene (total)	252	257	580	2500	0.0011 U	0.00097 U	0.0011 U	0.0011 U	0.243	0.001 U	0.00079 U	0.001 U	0.001 U
Semi-Volatile Organic Compounds (mg/kg)													
Acenaphthene	NA	NA	3600	45000	0.038 U	0.035 U	0.037 U	0.035 U	2.59	0.035 U	0.038 U	0.036 U	0.038 U
Acenaphthylene	NA	NA	NA	NA	0.038 U	0.035 U	0.037 U	0.035 U	0.037 U	0.035 U	0.038 U	0.036 U	0.038 U
Anthracene	NA	NA	18000	230000	0.038 U	0.035 U	0.037 U	0.035 U	3.3	0.035 U	0.038 U	0.036 U	0.038 U
Benzo(a)anthracene	NA	NA	1.1	21	0.016 J	0.035 U	0.0126 J	0.011 J	0.693	0.035 U	0.038 U	0.0306 J	0.038 U
Benzo(a)pyrene	0.07	1.54	0.11	2.1	0.0179 J	0.035 U	0.037 U	0.035 U	**0.449**	0.035 U	0.038 U	0.0287 J	0.038 U
Benzo(b)fluoranthene	NA	NA	1.1	21	0.0252 J	0.035 U	0.0184 J	0.0175 J	0.592	0.035 U	0.038 U	0.0447	0.038 U
Benzo(g,h,i)perylene	NA	NA	NA	NA	0.0254 J	0.035 U	0.037 U	0.035 U	0.169	0.035 U	0.038 U	0.0228 J	0.038 U
Benzo(k)fluoranthene	NA	NA	11	210	0.038 U	0.035 U	0.037 U	0.035 U	0.227	0.035 U	0.038 U	0.036 U	0.038 U
Chrysene	NA	NA	110	2100	0.0202 J	0.035 U	0.037 U	0.035 U	0.523	0.035 U	0.038 U	0.0289 J	0.038 U
Dibenz(a,h)anthracene	NA	NA	0.11	2.1	0.038 U	0.035 U	0.037 U	0.035 U	0.0572	0.035 U	0.038 U	0.036 U	0.038 U
Fluoranthene	2301	26371	2400	30000	0.0262 J	0.035 U	0.0206 J	0.0162 J	3.12	0.035 U	0.038 U	0.0567	0.038 U
Fluorene	2301	26371	2400	30000	0.038 U	0.035 U	0.037 U	0.035 U	2.24	0.035 U	0.038 U	0.036 U	0.038 U
Indeno(1,2,3-cd)pyrene	NA	NA	1.1	21	0.0185 J	0.035 U	0.037 U	0.035 U	0.209	0.035 U	0.038 U	0.0213 J	0.038 U
Naphthalene	2.7	16	3.8	17	0.038 U	0.035 U	0.037 U	0.035 U	**12.5**	0.035 U	0.038 U	0.011 J	0.0239 J
Phenanthrene	NA	NA	NA	NA	0.038 U	0.035 U	0.037 U	0.035 U	11.2	0.035 U	0.038 U	0.0131 J	0.038 U
Pyrene	NA	NA	1800	23000	0.0277 J	0.035 U	0.0167 J	0.0134 J	2.16	0.035 U	0.038 U	0.0466	0.038 U
Benzo(a)Pyrene Equivalent (ND = 0 RL)	0.07	1.54	NA	NA	0.047	ND	0.003	0.003	**0.66**	ND	ND	0.038	ND
Benzo(a)Pyrene Equivalent (ND = 1/2 RL)	0.07	1.54	NA	NA	0.066	ND	0.042	0.040	**0.66**	ND	ND	0.057	ND

TABLE 5.5-1
AOC 5 - TURBINE BUILDING: SOIL ANALYTICAL RESULTS COMPARED TO RESIDENTIAL AND NON-RESIDENTIAL SOIL CRITERIA
VERMONT YANKEE
VERNON, VERMONT

Location Name Sample Name Sample Date Lab Sample ID Sample Depth (bgs)	VT ANR 2019 Proposed Residential Soil	VT ANR 2019 Proposed Non-Residential Soil	USEPA RSL Residential Soil HI = 1.0 May 2019	USEPA RSL Industrial Soil HI = 1.0 May 2019	DP0501 DP050101 05/03/2019 JC87563-11 0 - 1 (ft)	DP0501 DP050120 05/03/2019 JC87563-12 20 - 22 (ft)	DP0502 DP050201 05/03/2019 JC87563-7 0 - 1 (ft)	DP0502 DP050201 DUP 05/03/2019 JC87563-8 0 - 1 (ft)	DP0502 DP050218 05/03/2019 JC87563-9 18 - 20 (ft)	DP0503 DP050301 05/03/2019 JC87563-13 0 - 1 (ft)	DP0503 DP050317 05/03/2019 JC87563-14 17 - 19 (ft)	DP0504 DP050401 05/03/2019 JC87563-5 0 - 1 (ft)	DP0504 DP050416 05/03/2019 JC87563-6 16 - 18 (ft)
Total Petroleum Hydrocarbons (mg/kg)													
Total Petroleum Hydrocarbons (C10-C28) DRO	NA	NA	NA	NA	10.4	9.4 U	10 U	10 U	4790	11 U	11 U	30	10 U
Total Petroleum Hydrocarbons (C6-C10) GRO	NA	NA	NA	NA	21 U	15 U	23 U	22 U	1110	22 U	21 U	21 U	22 U
Inorganic Compounds (mg/kg)													
Aluminum	72507	941748	77000	1.10E+06	13100 J+	6850 J+	8790 J+	9030 J+	7630 J+	10200 J+	9730 J+	9890 J+	9670 J+
Antimony	26	319	31	470	2.3 UJ	2.2 UJ	2.2 UJ	2.3 UJ	2.3 UJ	2.3 UJ	2.4 UJ	2.3 UJ	2.4 UJ
Arsenic	16	16	0.68	3	8	2.7	3.6	3.9	3.7	5.8	4.5	4.4	3.8
Barium	11247	127382	15000	220000	23 U	22 U	32.3	33.8	24.9	26.2	36.5	38.9	26.3
Beryllium	35	289	160	2300	0.34	0.22 U	0.26	0.27	0.24	0.25	0.29	0.27	0.31
Cadmium	6.9	87	71	980	0.58 U	0.54 U	0.56 U	0.58 U	0.57 U	0.56 U	0.6 U	0.56 U	0.59 U
Calcium	NA	NA	NA	NA	1220	1360	1320	1940	1150	5050	1590	3700	1560
Chromium	NA	NA	NA	NA	17.9	13.9	17.3	18.3	13.7	17.4	16.4	43	16.7
Cobalt	22	291	23	350	7.1	5.4 U	7.3	8.3	6.7	8.4	7.6	8	7.5
Copper	10407	139231	3100	47000	22.6	9.1	15.2	15.2	9.5	19.3	13.6	22.1	13.7
Iron	51302	686351	55000	820000	19700	12100	17000	16400	12000	19600	16000	18800	14400
Lead	400	800	400	800	16.8	3.8	6.8	8.4	3.7	13.2	5.5	20.2	5
Magnesium	NA	NA	NA	NA	3720	3250	4060	3820	3020	4800	3870	4930	3740
Manganese	1118	11350	1800	26000	290	196	419	434	194	323	352	454	335
Mercury	3.1	3.1	11	46	0.036 U	0.034 U	0.037 U	0.036 U	0.039 U	0.036 U	0.038 U	0.034 U	0.038 U
Nickel	940	9707	1500	22000	18.4	13.6	18.9	19.9	15.4	20.3	18.4	33.6	18.2
Potassium	NA	NA	NA	NA	1200 U	1100 U	1100 U	1200 U	1100 U	1100 U	1200 U	1150	1200 U
Selenium	366	4900	390	5800	2.3 U	2.2 U	2.2 U	2.3 U	2.3 U	2.3 U	2.4 U	2.3 U	2.4 U
Silver	237	2483	390	5800	0.58 U	0.54 U	0.56 U	0.58 U	0.57 U	0.56 U	0.6 U	0.56 U	0.59 U
Sodium	NA	NA	NA	NA	1200 U	1100 U	1100 U	1200 U	1100 U	1100 U	1200 U	1100 U	1200 U
Thallium	0.73	196100	0.78	12	**1.2 U**	**1.1 U**	**1.1 U**	**1.2 U**	**1.1 U**	**1.1 U**	**1.2 U**	**1.1 U**	**1.2 U**
Vanadium	2.8	27	390	5800	**26.8**	**16.7**	**21**	**24.3**	**16.4**	**26.6**	**21.2**	**24.5**	**20.6**
Zinc	21986	294150	23000	350000	92.3	28.6	42.7	45.4	25.8	271	36.3	93	32
Other													
Total Solids (%)	NA	NA	NA	NA	85.7 J	90.2 J	88.2	89.3 J	85.8 J	92.2 J	86.3 J	91.5 J	82.4 J

TABLE 5.5-1
AOC 5 - TURBINE BUILDING: SOIL ANALYTICAL RESULTS COMPARED TO RESIDENTIAL AND NON-RESIDENTIAL SOIL CRITERIA
VERMONT YANKEE
VERNON, VERMONT

Location Name Sample Name Sample Date Lab Sample ID Sample Depth (bgs)	VT ANR 2019 Proposed Residential Soil	VT ANR 2019 Proposed Non-Residential Soil	USEPA RSL Residential Soil HI = 1.0 May 2019	USEPA RSL Industrial Soil HI = 1.0 May 2019	DP0501 DP050101 05/03/2019 JC87563-11 0 - 1 (ft)	DP0501 DP050120 05/03/2019 JC87563-12 20 - 22 (ft)	DP0502 DP050201 05/03/2019 JC87563-7 0 - 1 (ft)	DP0502 DP050201 DUP 05/03/2019 JC87563-8 0 - 1 (ft)	DP0502 DP050218 05/03/2019 JC87563-9 18 - 20 (ft)	DP0503 DP050301 05/03/2019 JC87563-13 0 - 1 (ft)	DP0503 DP050317 05/03/2019 JC87563-14 17 - 19 (ft)	DP0504 DP050401 05/03/2019 JC87563-5 0 - 1 (ft)	DP0504 DP050416 05/03/2019 JC87563-6 16 - 18 (ft)
PFAS (mg/kg)													
Fluorotelomer sulfonic acid (4:2 FTSA)	NA	NA	NA	NA	-	-	0.0012 U	0.0011 U	0.0012 U	-	-	0.0011 U	0.0012 U
Fluorotelomer sulfonic acid (6:2 FTSA)	NA	NA	NA	NA	-	-	0.0012 U	0.0011 U	0.0012 U	-	-	0.0011 U	0.0012 U
Fluorotelomer sulfonic acid (8:2 FTSA)	NA	NA	NA	NA	-	-	0.0012 U	0.0011 U	0.0012 U	-	-	0.0011 U	0.0012 U
N-ethyl perfluorooctane sulfonamidoacetic acid (N-EtFOSAA)	NA	NA	NA	NA	-	-	0.0029 U	0.0028 U	0.0029 U	-	-	0.0027 U	0.003 U
N-methyl perfluorooctane sulfonamidoacetic acid (N-MeFOSAA)	NA	NA	NA	NA	-	-	0.0029 U	0.0028 U	0.0029 U	-	-	0.0027 U	0.003 U
Perfluorobutanesulfonic Acid (PFBS)	NA	NA	1300	16000	-	-	0.0012 U	0.0011 U	0.0012 U	-	-	0.0011 U	0.0012 U
Perfluorobutanoic Acid (PFBA)	NA	NA	NA	NA	-	-	0.000293 J	0.000362 J	0.0012 U	-	-	0.000299 J	0.0012 U
Perfluorodecane sulfonic Acid (PFDS)	NA	NA	NA	NA	-	-	0.0012 U	0.0011 U	0.0012 U	-	-	0.0011 U	0.0012 U
Perfluorodecanoic acid (PFDA)	NA	NA	NA	NA	-	-	0.0012 U	0.0011 U	0.0012 U	-	-	0.0011 U	0.0012 U
Perfluorododecanoic acid (PFDoDA)	NA	NA	NA	NA	-	-	0.0012 U	0.0011 U	0.0012 U	-	-	0.0011 U	0.0012 U
Perfluoroheptane sulfonic acid (PFHpS)	NA	NA	NA	NA	-	-	0.0012 U	0.0011 U	0.0012 U	-	-	0.0011 U	0.0012 U
Perfluoroheptanoic acid (PFHpA)	1.22	14.36	NA	NA	-	-	0.0012 U	0.0011 U	0.0012 U	-	-	0.0011 U	0.0012 U
Perfluorohexanesulfonic acid (PFHxS)	1.22	14.36	NA	NA	-	-	0.0012 U	0.0011 U	0.0012 U	-	-	0.0011 U	0.0012 U
Perfluorohexanoic acid (PFHxA)	NA	NA	NA	NA	-	-	0.0012 U	0.0011 U	0.0012 U	-	-	0.0011 U	0.0012 U
Perfluorononane sulfonic acid (PFNS)	NA	NA	NA	NA	-	-	0.0012 U	0.0011 U	0.0012 U	-	-	0.0011 U	0.0012 U
Perfluorononanoic Acid (PFNA)	1.22	14.36	NA	NA	-	-	0.0012 U	0.0011 U	0.0012 U	-	-	0.0011 U	0.0012 U
Perfluorooctane sulfonamide (FOSA)	NA	NA	NA	NA	-	-	0.0012 U	0.0011 U	0.0012 U	-	-	0.0011 U	0.0012 U
Perfluorooctanesulfonic acid (PFOS)	1.22	14.36	NA	NA	-	-	0.0012 U	0.0011 U	0.0012 U	-	-	0.0011 U	0.0012 U
Perfluorooctanoic Acid (PFOA)	1.22	14.36	NA	NA	-	-	0.0012 U	0.0011 U	0.0012 U	-	-	0.0011 U	0.0012 U
Perfluoropentane sulfonic acid (PFPeS)	NA	NA	NA	NA	-	-	0.0012 U	0.0011 U	0.0012 U	-	-	0.0011 U	0.0012 U
Perfluoropentanoic Acid (PFPeA)	NA	NA	NA	NA	-	-	0.0012 U	0.0011 U	0.0012 U	-	-	0.0011 U	0.0012 U
Perfluorotetradecanoic acid (PFTeDA)	NA	NA	NA	NA	-	-	0.0012 U	0.0011 U	0.0012 U	-	-	0.0011 U	0.0012 U
Perfluorotridecanoic acid (PFTrDA)	NA	NA	NA	NA	-	-	0.0012 U	0.0011 U	0.0012 U	-	-	0.0011 U	0.0012 U
Perfluoroundecanoic acid (PFUnA)	NA	NA	NA	NA	-	-	0.0012 U	0.0011 U	0.0012 U	-	-	0.0011 U	0.0012 U

ABBREVIATIONS AND NOTES:
-: Not Analyzed
*: Outside of QC limits
J: value is estimated
mg/kg: milligram per kilogram
NA: Not Applicable
RSL: Risk-Based Screening Levels
U: Not detected, value is the laboratory reporting limit
VT ANR: Vermont Agency of Natural Resources
USEPA: United State Environmental Protection Agency

- Volatile and Semi-Volatile analytes detected in at least one sample are reported herein. For a complete list of analytes see the laboratory data sheets.
- Bold values indicate an exceedance of the Proposed 2019 VT ANR Residential Soil values and the USEPA May 2019 Residential Soil RSL where no VT ANR value is available.
- Italicized values indicate an exceedance of the Proposed 2019 VT ANR Non-Residential Soil values and the USEPA May 2019 Industrial Soil RSL where no VT ANR value is available.

TABLE 5.5-2
AOC 5 - TURBINE BUILDING: GROUNDWATER ANALYTICAL RESULTS COMPARED TO GROUNDWATER ENFORCEMENT STANDARDS
VERMONT YANKEE
VERNON, VERMONT

Location Name Sample Name Sample Date Lab Sample ID	VT ANR Proposed 2019 Groundwater Enforcement	DP0501 GW0501-20190503 05/03/2019 JC87576-7	DP0502 GW0502-20190503 05/03/2019 JC87576-4	DP0503 GW0503-20190503 05/03/2019 JC87576-5	DP0504 GW0504-20190503 05/03/2019 JC87576-3
Volatile Organic Compounds (ug/L)					
1,1,1,2-Tetrachloroethane	70	1 U	1 U	1 U	1 U
1,1,1-Trichloroethane	200	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	NA	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	5	1 U	1 U	1 U	1 U
1,1-Dichloroethane	70	1 U	1.1	1 U	1 U
1,1-Dichloroethene	7	1 U	1 U	1 U	1 U
1,1-Dichloropropene	NA	1 U	1 U	1 U	1 U
1,2,3-Trichlorobenzene	0.9	**1 U**	**1 U**	**1 U**	**1 U**
1,2,3-Trichloropropane	0.02	**2 U**	**2 U**	**2 U**	**2 U**
1,2,4-Trichlorobenzene	70	1 U	1 U	1 U	1 U
1,2,4-Trimethylbenzene	23	1.5 J	**48.5**	2 U	2 U
1,2-Dibromo-3-chloropropane (DBCP)	0.2	**2 U**	**2 U**	**2 U**	**2 U**
1,2-Dibromoethane (Ethylene Dibromide)	0.05	**1 U**	**1 U**	**1 U**	**1 U**
1,2-Dichlorobenzene	600	1 U	1 U	1 U	1 U
1,2-Dichloroethane	5	1 U	1 U	1 U	1 U
1,2-Dichloropropane	5	1 U	1 U	1 U	1 U
1,3,5-Trimethylbenzene	23	2 U	15.8	2 U	2 U
1,3-Dichlorobenzene	600	1 U	1 U	1 U	1 U
1,3-Dichloropropane	NA	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	75	1 U	1 U	1 U	1 U
2,2-Dichloropropane	NA	1 U	1 U	1 U	1 U
2-Butanone (Methyl Ethyl Ketone)	511	10 U	10 U	10 U	10 U
2-Chlorotoluene	NA	2 U	2 U	2 U	2 U
2-Phenylbutane (sec-Butylbenzene)	NA	2 U	2.9	2 U	2 U
4-Chlorotoluene	NA	2 U	2 U	2 U	2 U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	NA	5 U	5 U	5 U	5 U
Acetone	950	10 U	10 U	10 U	10 U
Benzene	5	0.5 U	0.5 U	0.5 U	0.5 U
Bromobenzene	NA	1 U	1 U	1 U	1 U
Bromodichloromethane	NA	1 U	1 U	1 U	1 U
Bromoform	NA	1 U	1 U	1 U	1 U
Bromomethane (Methyl Bromide)	5	2 U	2 U	2 U	2 U
Carbon tetrachloride	5	1 U	1 U	1 U	1 U
Chlorobenzene	100	1 U	1 U	1 U	1 U
Chlorobromomethane	8	1 U	1 U	1 U	1 U
Chloroethane	NA	1 U	1 U	1 U	1 U
Chloroform (Trichloromethane)	NA	1 U	1 U	1 U	1 U
Chloromethane (Methyl Chloride)	NA	1 U	1 U	1 U	1 U
cis-1,2-Dichloroethene	70	1 U	1 U	1 U	1.8
cis-1,3-Dichloropropene	NA	1 U	1 U	1 U	1 U
Cymene (p-Isopropyltoluene)	NA	2 U	2.9	2 U	2 U
Dibromochloromethane	NA	1 U	1 U	1 U	1 U
Dibromomethane	NA	1 U	1 U	1 U	1 U
Dichlorodifluoromethane (CFC-12)	NA	2 U	2 U	2 U	2 U
Ethylbenzene	700	1 U	1.9	1 U	1 U
Hexachlorobutadiene	NA	2 U	2 U	2 U	2 U
Isopropylbenzene (Cumene)	NA	1 U	2.3	1 U	1 U
m,p-Xylenes	NA	1 U	1.7	1 U	1 U
Methyl Tert Butyl Ether	11	1 U	1 U	1 U	1 U
Methylene chloride	5	2 U	2 U	2 U	2 U
Naphthalene	0.5	**4.1 J**	**59.1**	**5 U**	**5 U**
n-Butylbenzene	NA	2 U	2.1	2 U	2 U
n-Propylbenzene	NA	2 U	5.4	2 U	2 U
o-Xylene	NA	1 U	1 U	1 U	1 U
Styrene	100	1 U	1 U	1 U	1 U
tert-Butylbenzene	NA	2 U	2 U	2 U	2 U
Tetrachloroethene	5	1 U	1 U	1 U	1 U
Toluene	1000	1 U	1 U	1 U	1 U
trans-1,2-Dichloroethene	100	1 U	1 U	1 U	1 U
trans-1,3-Dichloropropene	NA	1 U	1 U	1 U	1 U
Trichloroethene	5	1 U	1 U	1 U	2.4
Trichlorofluoromethane (CFC-11)	NA	2 U	2 U	2 U	2 U
Vinyl chloride	2	1 U	1 U	1 U	1 U
Xylene (total)	10000	1 U	1.7	1 U	1 U
Semi-Volatile Organic Compounds (ug/L)					
Acenaphthene	NA	0.32 J	0.45 J	0.98 U	0.98 U
Acenaphthylene	NA	0.98 U	1.1 U	0.98 U	0.98 U
Anthracene	343	0.98 U	1.1 U	0.98 U	0.98 U
Benzo(a)anthracene	NA	0.98 U	1.1 U	0.98 U	0.98 U
Benzo(a)pyrene	0.2	**0.98 U**	**1.1 U**	**0.98 U**	**0.98 U**
Benzo(b)fluoranthene	NA	0.98 U	1.1 U	0.98 U	0.98 U
Benzo(g,h,i)perylene	NA	0.98 U	1.1 U	0.98 U	0.98 U
Benzo(k)fluoranthene	NA	0.98 U	1.1 U	0.98 U	0.98 U
Chrysene	NA	0.98 U	1.1 U	0.98 U	0.98 U
Dibenz(a,h)anthracene	NA	0.98 U	1.1 U	0.98 U	0.98 U
Fluoranthene	46	0.98 U	1.1 U	0.98 U	0.98 U
Fluorene	46	0.37 J	0.52 J	0.98 U	0.98 U
Indeno(1,2,3-cd)pyrene	NA	0.98 U	1.1 U	0.98 U	0.98 U
Naphthalene	0.5	**0.89 J**	**3.4**	**0.98 U**	**0.98 U**
Phenanthrene	NA	1	1 J	0.98 U	0.98 U
Pyrene	NA	0.98 U	1.1 U	0.98 U	0.98 U

TABLE 5.5-2
AOC 5 - TURBINE BUILDING: GROUNDWATER ANALYTICAL RESULTS COMPARED TO GROUNDWATER ENFORCEMENT STANDARDS
VERMONT YANKEE
VERNON, VERMONT

Location Name Sample Name Sample Date Lab Sample ID	VT ANR Proposed 2019 Groundwater Enforcement	DP0501 GW0501-20190503 05/03/2019 JC87576-7	DP0502 GW0502-20190503 05/03/2019 JC87576-4	DP0503 GW0503-20190503 05/03/2019 JC87576-5	DP0504 GW0504-20190503 05/03/2019 JC87576-3
Total Petroleum Hydrocarbons (ug/L)					
Total Petroleum Hydrocarbons (C10-C28) DRO	NA	134	1350	83 U	83 U
Total Petroleum Hydrocarbons (C6-C10) GRO	NA	200 U	481	200 U	200 U
Inorganic Compounds (ug/L)					
Aluminum, Total	NA	27000	46400	11700	30000
Antimony, Total	NA	30 U	30 U	6 U	30 U
Arsenic, Total	10	**15 U**	**21.5**	3.1	**15 U**
Barium, Total	2000	1000 U	1000 U	200 U	1000 U
Beryllium, Total	4	**5 U**	**5 U**	1 U	**5 U**
Cadmium, Total	5	**15 U**	**15 U**	3 U	**15 U**
Calcium, Total	NA	27100	127000	65200	71200
Chromium, Total	100	**102**	**127**	45.3	76
Cobalt, Total	NA	250 U	250 U	50 U	250 U
Copper, Total	1300	50.5	71	28.8	50 U
Iron, Total	NA	42600	84700	20800	47500
Lead, Total	15	15 U	**26.5**	4.9	15 U
Magnesium, Total	NA	25000 U	37800	11800	25000 U
Manganese, Total	300	**807**	**13900**	**585**	**3780**
Mercury, Total	NA	0.2 U	0.2 U	0.2 U	0.2 U
Nickel, Total	100	70	**106**	38.6	55.5
Potassium, Total	NA	50000 U	50000 U	10000 U	50000 U
Selenium, Total	50	50 U	50 U	10 U	50 U
Silver, Total	NA	50 U	50 U	10 U	50 U
Sodium, Total	NA	439000	319000	534000	50000 U
Thallium, Total	2	**50 U**	**50 U**	**10 U**	**50 U**
Vanadium, Total	NA	250 U	250 U	50 U	250 U
Zinc, Total	NA	374	251	181	211
PFAS (ug/L)					
Fluorotelomer sulfonic acid (4:2 FTSA)	NA	-	0.008 U	-	0.008 U
Fluorotelomer sulfonic acid (6:2 FTSA)	NA	-	0.008 U	-	0.008 U
Fluorotelomer sulfonic acid (8:2 FTSA)	NA	-	0.008 U	-	0.008 U
N-ethyl perfluorooctane sulfonamidoacetic acid (N-EtFOSAA)	NA	-	0.02 U	-	0.02 U
N-methyl perfluorooctane sulfonamidoacetic acid (N-MeFOSAA)	NA	-	0.02 U	-	0.02 U
Perfluorobutanesulfonic Acid (PFBS)	NA	-	0.0134	-	0.0303
Perfluorobutanoic Acid (PFBA)	NA	-	0.00946	-	0.0333
Perfluorodecane sulfonic Acid (PFDS)	NA	-	0.004 U	-	0.004 U
Perfluorodecanoic acid (PFDA)	NA	-	0.004 U	-	0.004 U
Perfluorododecanoic acid (PFDoDA)	NA	-	0.004 U	-	0.004 U
Perfluoroheptane sulfonic acid (PFHpS)	NA	-	0.004 U	-	0.004 U
Perfluoroheptanoic acid (PFHpA)	0.02	-	0.0137	-	**0.121**
Perfluorohexanesulfonic acid (PFHxS)	0.02	-	0.00116 J	-	0.00139 J
Perfluorohexanoic acid (PFHxA)	NA	-	0.0107	-	0.0697
Perfluorononane sulfonic acid (PFNS)	NA	-	0.004 U	-	0.004 U
Perfluorononanoic Acid (PFNA)	0.02	-	0.004 U	-	0.004 U
Perfluorooctane sulfonamide (FOSA)	NA	-	0.004 U	-	0.004 U
Perfluorooctanesulfonic acid (PFOS)	0.02	-	0.00223 J	-	0.004 U
Perfluorooctanoic Acid (PFOA)	0.02	-	0.00817	-	0.004 U
Perfluoropentane sulfonic acid (PFPeS)	NA	-	0.004 U	-	0.004 U
Perfluoropentanoic Acid (PFPeA)	NA	-	0.0122	-	0.0515
Perfluorotetradecanoic acid (PFTeDA)	NA	-	0.004 U	-	0.004 U
Perfluorotridecanoic acid (PFTrDA)	NA	-	0.004 U	-	0.004 U
Perfluoroundecanoic acid (PFUnA)	NA	-	0.004 U	-	0.004 U
SUM of PFAS (ND = 0)	0.02	-	**0.02526**	-	**0.12239**
SUM of PFAS (ND = 1/2 RL)	0.02	-	**0.02726**	-	**0.12839**

ABBREVIATIONS AND NOTES:
-: Not Analyzed
J: valued is estimated
J+: valued is estimated with a potential high bias
mS/cm: milliSiemen per centimeter
mv: millivolt
NA: Not Applicable
NTU: Nephelometric Turbidiy Units
RSL: Risk-Based Screening Levels
U: Not detected, value is the laboratory reporting limit
ug/L: microgram per liter
USEPA: United States Environmental Protection Agency
VT ANR: Vermont Agency of Natural Resources

- Volatile and Semi-Volatile analytes detected in at least one sample are reported herein. For a complete list of analytes see the laboratory data sheets.
- Bold values indicate an exceedance of the VT ANR Proposed 2019 Groundwater Enforcement Standard.

TABLE 5.6-1
AOC 6 - RADIOLOGICAL WASTE BUILDING AND TANKS: SOIL ANALYTICAL RESULTS COMPARED TO RESIDENTIAL AND NON-RESIDENTIAL SOIL CRITERIA
VERMONT YANKEE
VERNON, VERMONT

Location Name Sample Name Sample Date Lab Sample ID Sample Depth (bgs)	VT ANR 2019 Proposed Residential Soil	VT ANR 2019 Proposed Non-Residential Soil	Res value for Conditional Formatting	Non Res value for Conditional Formatting	DP0601 DP060101 05/01/2019 JC87450-1 0 - 1 (ft)	DP0601 DP060122 05/01/2019 JC87450-2 22 - 23 (ft)	DP0602 DP060201 05/01/2019 JC87450-3 0 - 1 (ft)	DP0602 DP060212 05/01/2019 JC87450-4 10 - 12 (ft)
Volatile Organic Compounds (mg/kg)								
1,1,1,2-Tetrachloroethane	1.3	8	1.3	8	0.0024 U	0.0021 U	0.0018 U	0.0019 U
1,1,1-Trichloroethane	NA	NA	8100	36000	0.0024 U	0.0021 U	0.0018 U	0.0019 U
1,1,2,2-Tetrachloroethane	NA	NA	0.6	2.7	0.0024 U	0.0021 U	0.0018 U	0.0019 U
1,1,2-Trichloroethane	NA	NA	1.1	5	0.0024 U	0.0021 U	0.0018 U	0.0019 U
1,1-Dichloroethane	2.1	13	2.1	13	0.0012 U	0.0011 U	0.00088 U	0.00096 U
1,1-Dichloroethene	NA	NA	230	1000	0.0012 U	0.0011 U	0.00088 U	0.00096 U
1,1-Dichloropropene	NA	NA	NA	NA	0.0024 U	0.0021 U	0.0018 U	0.0019 U
1,2,3-Trichlorobenzene	NA	NA	63	930	0.006 U	0.0053 U	0.0044 U	0.0048 U
1,2,3-Trichloropropane	0.00311	0.07	0.00311	0.07	**0.006 U**	**0.0053 U**	**0.0044 U**	**0.0048 U**
1,2,4-Trichlorobenzene	NA	NA	24	110	0.006 U	0.0053 U	0.0044 U	0.0048 U
1,2,4-Trimethylbenzene	144	177	144	177	0.0024 U	0.0021 U	0.0018 U	0.0019 U
1,2-Dibromo-3-chloropropane (DBCP)	0.01	0.06	0.01	0.06	0.0024 U	0.0021 U	0.0018 U	0.0019 U
1,2-Dibromoethane (Ethylene Dibromide)	0.02	0.14	0.02	0.14	0.0012 U	0.0011 U	0.00088 U	0.00096 U
1,2-Dichlorobenzene	NA	NA	1800	9300	0.0012 U	0.0011 U	0.00088 U	0.00096 U
1,2-Dichloroethane	0.29	1.7	0.29	1.7	0.0012 U	0.0011 U	0.00088 U	0.00096 U
1,2-Dichloropropane	1.5	9.1	1.5	9.1	0.0024 U	0.0021 U	0.0018 U	0.0019 U
1,3,5-Trimethylbenzene	144	177	144	177	0.0024 U	0.0021 U	0.0018 U	0.0019 U
1,3-Dichlorobenzene	NA	NA	NA	NA	0.0012 U	0.0011 U	0.00088 U	0.00096 U
1,3-Dichloropropane	NA	NA	1600	23000	0.0024 U	0.0021 U	0.0018 U	0.0019 U
1,4-Dichlorobenzene	NA	NA	2.6	11	0.0012 U	0.0011 U	0.00088 U	0.00096 U
2,2-Dichloropropane	NA	NA	NA	NA	0.0024 U	0.0021 U	0.0018 U	0.0019 U
2-Butanone (Methyl Ethyl Ketone)	16952	26991	16952	26991	0.012 U	0.0096 J	0.0088 U	0.0096 U
2-Chlorotoluene	NA	NA	1600	23000	0.0024 U	0.0021 U	0.0018 U	0.0019 U
2-Phenylbutane (sec-Butylbenzene)	7009	102200	7009	102200	0.0024 U	0.0021 U	0.0018 U	0.0019 U
4-Chlorotoluene	NA	NA	1600	23000	0.0024 U	0.0021 U	0.0018 U	0.0019 U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	NA	NA	33000	140000	0.006 U	0.0053 U	0.0044 U	0.0048 U
Acetone	40609	100028	40609	100028	0.012 U	0.0487	0.0088 U	0.0253
Benzene	0.7	4.2	0.7	4.2	0.0006 U	0.00053 U	0.00044 U	0.00048 U
Bromobenzene	NA	NA	290	1800	0.006 U	0.0053 U	0.0044 U	0.0048 U
Bromodichloromethane	NA	NA	0.29	1.3	0.0024 U	0.0021 U	0.0018 U	0.0019 U
Bromoform	NA	NA	19	86	0.006 U	0.0053 U	0.0044 U	0.0048 U
Bromomethane (Methyl Bromide)	NA	NA	6.8	30	0.006 U	0.0053 U	0.0044 U	0.0048 U
Carbon tetrachloride	0.37	2.2	0.37	2.2	0.0024 U	0.0021 U	0.0018 U	0.0019 U
Chlorobenzene	414	726	414	726	0.0024 U	0.0021 U	0.0018 U	0.0019 U
Chlorobromomethane	193	597	193	597	0.006 U	0.0053 U	0.0044 U	0.0048 U
Chloroethane	NA	NA	14000	57000	0.006 U	0.0053 U	0.0044 U	0.0048 U
Chloroform (Trichloromethane)	NA	NA	0.32	1.4	0.0024 U	0.0021 U	0.0018 U	0.0019 U
Chloromethane (Methyl Chloride)	NA	NA	110	460	0.006 U	0.0053 U	0.0044 U	0.0048 U
cis-1,2-Dichloroethene	140	1814	140	1814	0.0012 U	0.0011 U	0.00088 U	0.00096 U
cis-1,3-Dichloropropene	NA	NA	NA	NA	0.0024 U	0.0021 U	0.0018 U	0.0019 U
Cymene (p-Isopropyltoluene)	NA	NA	NA	NA	0.0024 U	0.0021 U	0.0018 U	0.0019 U
Dibromochloromethane	NA	NA	8.3	39	0.0024 U	0.0021 U	0.0018 U	0.0019 U

TABLE 5.6-1
AOC 6 - RADIOLOGICAL WASTE BUILDING AND TANKS: SOIL ANALYTICAL RESULTS COMPARED TO RESIDENTIAL AND NON-RESIDENTIAL SOIL CRITERIA
VERMONT YANKEE
VERNON, VERMONT

Location Name Sample Name Sample Date Lab Sample ID Sample Depth (bgs)	VT ANR 2019 Proposed Residential Soil	VT ANR 2019 Proposed Non-Residential Soil	Res value for Conditional Formatting	Non Res value for Conditional Formatting	DP0601 DP060101 05/01/2019 JC87450-1 0 - 1 (ft)	DP0601 DP060122 05/01/2019 JC87450-2 22 - 23 (ft)	DP0602 DP060201 05/01/2019 JC87450-3 0 - 1 (ft)	DP0602 DP060212 05/01/2019 JC87450-4 10 - 12 (ft)
Dibromomethane	NA	NA	24	99	0.006 U	0.0053 U	0.0044 U	0.0048 U
Dichlorodifluoromethane (CFC-12)	NA	NA	87	370	0.006 U	0.0053 U	0.0044 U	0.0048 U
Ethylbenzene	3.7	22	3.7	22	0.0012 U	0.0011 U	0.00088 U	0.00096 U
Hexachlorobutadiene	NA	NA	1.2	5.3	0.006 U	0.0053 U	0.0044 U	0.0048 U
Isopropylbenzene (Cumene)	256	264	256	264	0.0024 U	0.0021 U	0.0018 U	0.0019 U
m,p-Xylenes	NA	NA	NA	NA	0.0012 U	0.0011 U	0.00088 U	0.00096 U
Methyl Tert Butyl Ether	649	4464	649	4464	0.0012 U	0.0011 U	0.00088 U	0.00096 U
Methylene chloride	NA	NA	57	1000	0.006 U	0.0053 U	0.0044 U	0.0048 U
Naphthalene	2.7	16	2.7	16	0.006 U	0.0053 U	0.0044 U	0.0048 U
n-Butylbenzene	3504	51100	3504	51100	0.0024 U	0.0021 U	0.0018 U	0.0019 U
n-Propylbenzene	253	261	253	261	0.0024 U	0.0021 U	0.0018 U	0.0019 U
o-Xylene	NA	NA	650	2800	0.0012 U	0.0011 U	0.00088 U	0.00096 U
Styrene	NA	NA	6000	35000	0.0024 U	0.0021 U	0.0018 U	0.0019 U
tert-Butylbenzene	7009	102200	7009	102200	0.0024 U	0.0021 U	0.0018 U	0.0019 U
Tetrachloroethene	2.4	14	2.4	14	0.0024 U	0.0021 U	0.0018 U	0.0019 U
Toluene	706	798	706	798	0.0012 U	0.0011 U	0.00088 U	0.00096 U
trans-1,2-Dichloroethene	1402	18137	1402	18137	0.0012 U	0.0011 U	0.00088 U	0.00096 U
trans-1,3-Dichloropropene	NA	NA	NA	NA	0.0024 U	0.0021 U	0.0018 U	0.0019 U
Trichloroethene	0.68	6.5	0.68	6.5	0.0012 U	0.0011 U	0.00088 U	0.00096 U
Trichlorofluoromethane (CFC-11)	NA	NA	23000	350000	0.006 U	0.0053 U	0.0044 U	0.0048 U
Vinyl chloride	0.1	0.59	0.1	0.59	0.0024 U	0.0021 U	0.0018 U	0.0019 U
Xylene (total)	252	257	252	257	0.0012 U	0.0011 U	0.00088 U	0.00096 U
Semi-Volatile Organic Compounds (mg/kg)								
1,2,4-Trichlorobenzene	NA	NA	24	110	0.073 U	0.071 U	0.07 U	0.075 U
1,2-Dichlorobenzene	NA	NA	1800	9300	0.073 U	0.071 U	0.07 U	0.075 U
1,2-Diphenylhydrazine	NA	NA	0.68	2.9	0.073 U	0.071 U	0.07 U	0.075 U
1,3-Dichlorobenzene	NA	NA	NA	NA	0.073 U	0.071 U	0.07 U	0.075 U
1,4-Dichlorobenzene	NA	NA	2.6	11	0.073 U	0.071 U	0.07 U	0.075 U
1-Methylnaphthalene	NA	NA	18	73	0.037 U	0.035 U	0.035 U	0.037 U
2,2'-oxybis(1-Chloropropane)	2804	36274	2804	36274	0.073 U	0.071 U	0.07 U	0.075 U
2,4,5-Trichlorophenol	NA	NA	6300	82000	0.18 U	0.18 U	0.18 U	0.19 U
2,4,6-Trichlorophenol	NA	NA	49	210	0.18 U	0.18 U	0.18 U	0.19 U
2,4-Dichlorophenol	NA	NA	190	2500	0.18 U	0.18 U	0.18 U	0.19 U
2,4-Dimethylphenol	NA	NA	1300	16000	0.18 U	0.18 U	0.18 U	0.19 U
2,4-Dinitrophenol	NA	NA	130	1600	0.18 U	0.18 U	0.18 U	0.19 U
2,4-Dinitrotoluene	NA	NA	1.7	7.4	0.037 U	0.035 U	0.035 U	0.037 U
2,6-Dinitrotoluene	NA	NA	0.36	1.5	0.037 U	0.035 U	0.035 U	0.037 U
2-Chloronaphthalene	NA	NA	4800	60000	0.073 U	0.071 U	0.07 U	0.075 U
2-Chlorophenol	NA	NA	390	5800	0.073 U	0.071 U	0.07 U	0.075 U
2-Methylnaphthalene	NA	NA	240	3000	0.037 U	0.035 U	0.035 U	0.037 U
2-Methylphenol (o-Cresol)	NA	NA	3200	41000	0.073 U	0.071 U	0.07 U	0.075 U
2-Nitroaniline	NA	NA	630	8000	0.18 U	0.18 U	0.18 U	0.19 U
2-Nitrophenol	NA	NA	NA	NA	0.18 U	0.18 U	0.18 U	0.19 U

TABLE 5.6-1
AOC 6 - RADIOLOGICAL WASTE BUILDING AND TANKS: SOIL ANALYTICAL RESULTS COMPARED TO RESIDENTIAL AND NON-RESIDENTIAL SOIL CRITERIA
VERMONT YANKEE
VERNON, VERMONT

Location Name Sample Name Sample Date Lab Sample ID Sample Depth (bgs)	VT ANR 2019 Proposed Residential Soil	VT ANR 2019 Proposed Non-Residential Soil	Res value for Conditional Formatting	Non Res value for Conditional Formatting	DP0601 DP060101 05/01/2019 JC87450-1 0 - 1 (ft)	DP0601 DP060122 05/01/2019 JC87450-2 22 - 23 (ft)	DP0602 DP060201 05/01/2019 JC87450-3 0 - 1 (ft)	DP0602 DP060212 05/01/2019 JC87450-4 10 - 12 (ft)
Semi-Volatile Organic Compounds (mg/kg) *(Continued)*								
3&4-Methylphenol	NA	NA	NA	NA	0.073 U	0.071 U	0.07 U	0.075 U
3,3'-Dichlorobenzidine	NA	NA	1.2	5.1	0.073 U	0.071 U	0.07 U	0.075 U
3-Nitroaniline	NA	NA	NA	NA	0.18 U	0.18 U	0.18 U	0.19 U
4,6-Dinitro-2-methylphenol	NA	NA	5.1	66	0.18 U	0.18 U	0.18 U	0.19 U
4-Bromophenyl phenyl ether	NA	NA	NA	NA	0.073 U	0.071 U	0.07 U	0.075 U
4-Chloro-3-methylphenol	NA	NA	6300	82000	0.18 U	0.18 U	0.18 U	0.19 U
4-Chloroaniline	NA	NA	2.7	11	0.18 U	0.18 U	0.18 U	0.19 U
4-Chlorophenyl phenyl ether	NA	NA	NA	NA	0.073 U	0.071 U	0.07 U	0.075 U
4-Nitroaniline	NA	NA	27	110	0.18 U	0.18 U	0.18 U	0.19 U
4-Nitrophenol	NA	NA	NA	NA	0.37 U	0.35 U	0.35 U	0.37 U
Acenaphthene	NA	NA	3600	45000	0.037 U	0.035 U	0.035 U	0.037 U
Acenaphthylene	NA	NA	NA	NA	0.037 U	0.035 U	0.035 U	0.037 U
Aniline	NA	NA	95	400	0.073 U	0.071 U	0.07 U	0.075 U
Anthracene	NA	NA	18000	230000	0.037 U	0.035 U	0.035 U	0.037 U
Benzidine	NA	NA	0.00053	0.01	***0.37 U***	***0.35 U***	***0.35 U***	***0.37 U***
Benzo(a)anthracene	NA	NA	1.1	21	0.037 U	0.035 U	0.035 U	0.037 U
Benzo(a)pyrene	0.07	1.54	0.07	1.54	0.037 U	0.035 U	0.035 U	0.037 U
Benzo(b)fluoranthene	NA	NA	1.1	21	0.037 U	0.035 U	0.035 U	0.037 U
Benzo(g,h,i)perylene	NA	NA	NA	NA	0.037 U	0.035 U	0.035 U	0.037 U
Benzo(k)fluoranthene	NA	NA	11	210	0.037 U	0.035 U	0.035 U	0.037 U
Benzoic acid	NA	NA	250000	3300000	0.73 U	0.71 U	0.7 U	0.75 U
Benzyl Alcohol	NA	NA	6300	82000	0.073 U	0.071 U	0.07 U	0.075 U
bis(2-Chloroethoxy)methane	NA	NA	190	2500	0.073 U	0.071 U	0.07 U	0.075 U
bis(2-Chloroethyl)ether	NA	NA	0.23	1	0.073 U	0.071 U	0.07 U	0.075 U
bis(2-Ethylhexyl)phthalate	20	120	20	120	0.073 U	0.071 U	0.07 U	0.0378 J
Butyl benzylphthalate	NA	NA	290	1200	0.073 U	0.071 U	0.07 U	0.075 U
Carbazole	NA	NA	NA	NA	0.073 U	0.071 U	0.07 U	0.075 U
Chrysene	NA	NA	110	2100	0.037 U	0.035 U	0.035 U	0.037 U
Dibenz(a,h)anthracene	NA	NA	0.11	2.1	0.037 U	0.035 U	0.035 U	0.037 U
Dibenzofuran	NA	NA	73	1000	0.073 U	0.071 U	0.07 U	0.075 U
Diethyl phthalate	NA	NA	51000	660000	0.073 U	0.071 U	0.07 U	0.075 U
Dimethyl phthalate	NA	NA	NA	NA	0.073 U	0.071 U	0.07 U	0.075 U
Di-n-butylphthalate	NA	NA	6300	82000	0.073 U	0.071 U	0.07 U	0.075 U
Di-n-octyl phthalate	NA	NA	630	8200	0.073 U	0.071 U	0.07 U	0.075 U
Fluoranthene	2301	26371	2301	26371	0.037 U	0.035 U	0.035 U	0.037 U
Fluorene	2301	26371	2301	26371	0.037 U	0.035 U	0.035 U	0.037 U
Hexachlorobenzene	0.13	0.69	0.13	0.69	0.073 U	0.071 U	0.07 U	0.075 U
Hexachlorobutadiene	NA	NA	1.2	5.3	0.037 U	0.035 U	0.035 U	0.037 U
Hexachlorocyclopentadiene	NA	NA	1.8	7.5	0.37 U	0.35 U	0.35 U	0.37 U
Hexachloroethane	NA	NA	1.8	8	0.18 U	0.18 U	0.18 U	0.19 U
Indeno(1,2,3-cd)pyrene	NA	NA	1.1	21	0.037 U	0.035 U	0.035 U	0.037 U
Isophorone	NA	NA	570	2400	0.073 U	0.071 U	0.07 U	0.075 U

TABLE 5.6-1
AOC 6 - RADIOLOGICAL WASTE BUILDING AND TANKS: SOIL ANALYTICAL RESULTS COMPARED TO RESIDENTIAL AND NON-RESIDENTIAL SOIL CRITERIA
VERMONT YANKEE
VERNON, VERMONT

Location Name Sample Name Sample Date Lab Sample ID Sample Depth (bgs)	VT ANR 2019 Proposed Residential Soil	VT ANR 2019 Proposed Non-Residential Soil	Res value for Conditional Formatting	Non Res value for Conditional Formatting	DP0601 DP060101 05/01/2019 JC87450-1 0 - 1 (ft)	DP0601 DP060122 05/01/2019 JC87450-2 22 - 23 (ft)	DP0602 DP060201 05/01/2019 JC87450-3 0 - 1 (ft)	DP0602 DP060212 05/01/2019 JC87450-4 10 - 12 (ft)
Semi-Volatile Organic Compounds (mg/kg) ***(Continued)***								
Naphthalene	2.7	16	2.7	16	0.037 U	0.035 U	0.035 U	0.037 U
Nitrobenzene	NA	NA	5.1	22	0.073 U	0.071 U	0.07 U	0.075 U
N-Nitrosodimethylamine	NA	NA	0.002	0.034	***0.073 U***	***0.071 U***	***0.07 U***	***0.075 U***
N-Nitrosodi-n-propylamine	NA	NA	0.078	0.33	0.073 U	0.071 U	0.07 U	0.075 U
N-Nitrosodiphenylamine	NA	NA	110	470	0.18 U	0.18 U	0.18 U	0.19 U
Pentachlorophenol	0.48	2.9	0.48	2.9	0.15 U	0.14 U	0.14 U	0.15 U
Phenanthrene	NA	NA	NA	NA	0.037 U	0.035 U	0.035 U	0.037 U
Phenol	NA	NA	19000	250000	0.073 U	0.071 U	0.07 U	0.075 U
Pyrene	NA	NA	1800	23000	0.037 U	0.035 U	0.035 U	0.037 U
Pyridine	NA	NA	78	1200	0.073 U	0.071 U	0.07 U	0.075 U
Benzo(a)Pyrene Equivalent (ND = 0 RL)	0.07	1.54	0.07	1.54	ND	ND	ND	ND
Benzo(a)Pyrene Equivalent (ND = 1/2 RL)	0.07	1.54	0.07	1.54	ND	ND	ND	ND
Inorganic Compounds (mg/kg)								
Aluminum	72507	941748	72507	941748	8580 J+	9130 J+	11300 J+	10800 J+
Antimony	26	319	26	319	2.2 UJ	2.2 UJ	2.2 UJ	2.3 UJ
Arsenic	16	16	16	16	3.6	4.2	9.9	4.4
Barium	11247	127382	11247	127382	29.9	29.1	35.1	35.1
Beryllium	35	289	35	289	0.25	0.26	0.29	0.32
Cadmium	6.9	87	6.9	87	0.55 U	0.56 U	0.55 U	0.58 U
Calcium	NA	NA	NA	NA	1240	1340	1880	1470
Chromium	NA	NA	NA	NA	15.3	18.3	20.3	24.6
Cobalt	22	291	22	291	6.2	7.5	9.8	7.9
Copper	10407	139231	10407	139231	12.7	12	24	15.3
Iron	51302	686351	51302	686351	14700	14600	21900	17400
Lead	400	800	400	800	7.3	5.7	13.4	6.1
Magnesium	NA	NA	NA	NA	3700	4060	5280	4490
Manganese	1118	11350	1118	11350	648	210	439	290
Mercury	3.1	3.1	3.1	3.1	0.038 U	0.036 U	0.034 U	0.034 U
Nickel	940	9707	940	9707	17.3	19.6	23.5	20.2
Potassium	NA	NA	NA	NA	1100 U	1100 U	1100 U	1200 U
Selenium	366	4900	366	4900	2.2 U	2.2 U	2.2 U	2.3 U
Silver	237	2483	237	2483	0.55 U	0.56 U	0.55 U	0.58 U
Sodium	NA	NA	NA	NA	1100 U	1100 U	1100 U	1200 U
Thallium	0.73	196100	0.73	196100	**1.1 U**	**1.1 U**	**1.1 U**	**1.2 U**
Vanadium	2.8	27	2.8	27	**17.5**	**19.5**	***28.2***	**21.2**
Zinc	21986	294150	21986	294150	41.4	36.1	79	48.7

TABLE 5.6-1
AOC 6 - RADIOLOGICAL WASTE BUILDING AND TANKS: SOIL ANALYTICAL RESULTS COMPARED TO RESIDENTIAL AND NON-RESIDENTIAL SOIL CRITERIA
VERMONT YANKEE
VERNON, VERMONT

Location Name Sample Name Sample Date Lab Sample ID Sample Depth (bgs)	VT ANR 2019 Proposed Residential Soil	VT ANR 2019 Proposed Non-Residential Soil	Res value for Conditional Formatting	Non Res value for Conditional Formatting	DP0601 DP060101 05/01/2019 JC87450-1 0 - 1 (ft)	DP0601 DP060122 05/01/2019 JC87450-2 22 - 23 (ft)	DP0602 DP060201 05/01/2019 JC87450-3 0 - 1 (ft)	DP0602 DP060212 05/01/2019 JC87450-4 10 - 12 (ft)
PCBs (mg/kg)								
Aroclor-1016 (PCB-1016)	NA	NA	4.1	27	0.035 U	0.034 U	0.035 U	0.039 U
Aroclor-1221 (PCB-1221)	NA	NA	0.2	0.83	0.035 U	0.034 U	0.035 U	0.039 U
Aroclor-1232 (PCB-1232)	NA	NA	0.17	0.72	0.035 U	0.034 U	0.035 U	0.039 U
Aroclor-1242 (PCB-1242)	NA	NA	0.23	0.95	0.035 U	0.034 U	0.035 U	0.039 U
Aroclor-1248 (PCB-1248)	NA	NA	0.23	0.95	0.035 U	0.034 U	0.035 U	0.039 U
Aroclor-1254 (PCB-1254)	NA	NA	0.24	0.97	0.035 U	0.034 U	0.035 U	0.039 U
Aroclor-1260 (PCB-1260)	NA	NA	0.24	0.99	0.035 U	0.034 U	0.035 U	0.039 U
Aroclor-1262 (PCB-1262)	NA	NA	NA	NA	0.035 U	0.034 U	0.035 U	0.039 U
Aroclor-1268 (PCB-1268)	NA	NA	NA	NA	0.035 U	0.034 U	0.035 U	0.039 U
SUM of PCBs	NA	NA			ND	ND	ND	ND
Other								
Total Solids (%)	NA	NA	NA	NA	88.6 J	90.4 J	93.1 J	84.4 J

ABBREVIATIONS AND NOTES:
-: Not Analyzed
*: Outside of QC limits
J: value is estimated
mg/kg: milligram per kilogram
NA: Not Applicable
RSL: Risk-Based Screening Levels
U: Not detected, value is the laboratory reporting limit
VT ANR: Vermont Agency of Natural Resources
USEPA: United State Environmental Protection Agency

- Volatile and Semi-Volatile analytes detected in at least one sample are reported herein. For a complete list of analytes see the laboratory data sheets.
- Bold values indicate an exceedance of the Proposed 2019 VT ANR Residential Soil values and the USEPA May 2019 Residential Soil RSL where no VT ANR value is available.
- Italicized values indicate an exceedance of the Proposed 2019 VT ANR Non-Residential Soil values and the USEPA May 2019 Industrial Soil RSL where no VT ANR value is available.

TABLE 5.6-2
AOC 6 - RADIOLOGICAL WASTE BUILDING AND TANKS: GROUNDWATER ANALYTICAL RESULTS COMPARED TO GROUNDWATER ENFORCEMENT STANDARDS
VERMONT YANKEE
VERNON, VERMONT

Location Name Sample Name Sample Date Lab Sample ID	VT ANR Proposed 2019 Groundwater Enforcement	USEPA Tapwater RSL HI = 1.0 May 2019	DP0601 GW0601-20190515 05/15/2019 JC88303-2	DP0602 GW0602-20190515 05/15/2019 JC88303-1
Volatile Organic Compounds (ug/L)				
1,1,1,2-Tetrachloroethane	70	0.57	1 U	1 U
1,1,1-Trichloroethane	200	8000	1 U	1 U
1,1,2,2-Tetrachloroethane	NA	0.076	1 U	1 U
1,1,2-Trichloroethane	5	0.28	1 U	1 U
1,1-Dichloroethane	70	2.8	1 U	1 U
1,1-Dichloroethene	7	280	1 U	1 U
1,1-Dichloropropene	NA	NA	1 U	1 U
1,2,3-Trichlorobenzene	0.9	7	**1 U**	**1 U**
1,2,3-Trichloropropane	0.02	0.00075	**2 U**	**2 U**
1,2,4-Trichlorobenzene	70	1.2	1 U	1 U
1,2,4-Trimethylbenzene	23	56	2 U	2 U
1,2-Dibromo-3-chloropropane (DBCP)	0.2	0.00033	**2 U**	**2 U**
1,2-Dibromoethane (Ethylene Dibromide)	0.05	0.0075	**1 U**	**1 U**
1,2-Dichlorobenzene	600	300	1 U	1 U
1,2-Dichloroethane	5	0.17	1 U	1 U
1,2-Dichloropropane	5	0.85	1 U	1 U
1,3,5-Trimethylbenzene	23	60	2 U	2 U
1,3-Dichlorobenzene	600	NA	1 U	1 U
1,3-Dichloropropane	NA	370	1 U	1 U
1,4-Dichlorobenzene	75	0.48	1 U	1 U
2,2-Dichloropropane	NA	NA	1 U	1 U
2-Butanone (Methyl Ethyl Ketone)	511	5600	10 U	9 J
2-Chlorotoluene	NA	240	2 U	2 U
2-Phenylbutane (sec-Butylbenzene)	NA	2000	2 U	2 U
4-Chlorotoluene	NA	250	2 U	2 U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	NA	6300	5 U	5 U
Acetone	950	14000	17.4 U	50.1 U
Benzene	5	0.46	0.5 U	0.5 U
Bromobenzene	NA	62	1 U	1 U
Bromodichloromethane	NA	0.13	1 U	1 U
Bromoform	NA	3.3	1 U	1 U
Bromomethane (Methyl Bromide)	5	7.5	2 U	2 U
Carbon tetrachloride	5	0.46	1 U	1 U
Chlorobenzene	100	78	1 U	1 U
Chlorobromomethane	8	83	1 U	1 U
Chloroethane	NA	21000	1 U	1 U
Chloroform (Trichloromethane)	NA	0.22	1 U	1 U
Chloromethane (Methyl Chloride)	NA	190	1 U	1 U
cis-1,2-Dichloroethene	70	36	1 U	1 U
cis-1,3-Dichloropropene	NA	NA	1 U	1 U
Cymene (p-Isopropyltoluene)	NA	NA	2 U	2 U
Dibromochloromethane	NA	0.87	1 U	1 U
Dibromomethane	NA	8.3	1 U	1 U
Dichlorodifluoromethane (CFC-12)	NA	200	2 U	2 U
Ethylbenzene	700	1.5	1 U	1 U
Hexachlorobutadiene	NA	0.14	2 U	2 U
Isopropylbenzene (Cumene)	NA	450	1 U	1 U
m,p-Xylenes	NA	NA	1 U	1 U
Methyl Tert Butyl Ether	11	14	1 U	1 U
Methylene chloride	5	11	2 U	2 U
Naphthalene	0.5	0.17	**5 U**	**5 U**
n-Butylbenzene	NA	1000	2 U	2 U
n-Propylbenzene	NA	660	2 U	2 U
o-Xylene	NA	190	1 U	1 U
Styrene	100	1200	1 U	1 U
tert-Butylbenzene	NA	690	2 U	2 U
Tetrachloroethene	5	11	1 U	1 U
Toluene	1000	1100	1 U	1 U
trans-1,2-Dichloroethene	100	360	1 U	1 U
trans-1,3-Dichloropropene	NA	NA	1 U	1 U
Trichloroethene	5	0.49	1 U	1 U
Trichlorofluoromethane (CFC-11)	NA	5200	2 U	2 U
Vinyl chloride	2	0.019	1 U	1 U
Xylene (total)	10000	190	1 U	1 U

TABLE 5.6-2
AOC 6 - RADIOLOGICAL WASTE BUILDING AND TANKS: GROUNDWATER ANALYTICAL RESULTS COMPARED TO GROUNDWATER ENFORCEMENT STANDARDS
VERMONT YANKEE
VERNON, VERMONT

Location Name Sample Name Sample Date Lab Sample ID	VT ANR Proposed 2019 Groundwater Enforcement	USEPA Tapwater RSL HI = 1.0 May 2019	DP0601 GW0601-20190515 05/15/2019 JC88303-2	DP0602 GW0602-20190515 05/15/2019 JC88303-1
Semi-Volatile Organic Compounds (ug/L)				
1,2,4-Trichlorobenzene	70	1.2	0.95 U	0.95 U
1,2-Dichlorobenzene	600	300	0.95 U	0.95 U
1,2-Diphenylhydrazine	NA	0.078	0.95 U	0.95 U
1,3-Dichlorobenzene	600	NA	0.95 U	0.95 U
1,4-Dichlorobenzene	75	0.48	0.95 U	0.95 U
1-Methylnaphthalene	NA	1.1	0.95 U	0.95 U
2,2'-oxybis(1-Chloropropane)	46	710	1.9 U	1.9 U
2,4,5-Trichlorophenol	NA	1200	4.8 U	4.8 U
2,4,6-Trichlorophenol	NA	4.1	4.8 U	4.8 U
2,4-Dichlorophenol	NA	46	1.9 U	1.9 U
2,4-Dimethylphenol	NA	360	4.8 U	4.8 U
2,4-Dinitrophenol	NA	39	4.8 U	4.8 U
2,4-Dinitrotoluene	NA	0.24	0.95 U	0.95 U
2,6-Dinitrotoluene	NA	0.049	0.95 U	0.95 U
2-Chloronaphthalene	NA	750	1.9 U	1.9 U
2-Chlorophenol	NA	91	4.8 U	4.8 U
2-Methylnaphthalene	NA	36	0.95 U	0.95 U
2-Methylphenol (o-Cresol)	NA	930	1.9 U	1.9 U
2-Nitroaniline	NA	190	4.8 U	4.8 U
2-Nitrophenol	NA	NA	4.8 U	4.8 U
3&4-Methylphenol	NA	NA	1.9 U	1.9 U
3,3'-Dichlorobenzidine	NA	0.13	1.9 U	1.9 U
3-Nitroaniline	NA	NA	4.8 U	4.8 U
4,6-Dinitro-2-methylphenol	NA	1.5	4.8 U	4.8 U
4-Bromophenyl phenyl ether	NA	NA	1.9 U	1.9 U
4-Chloro-3-methylphenol	NA	1400	4.8 U	4.8 U
4-Chloroaniline	NA	0.37	4.8 U	4.8 U
4-Chlorophenyl phenyl ether	NA	NA	1.9 U	1.9 U
4-Nitroaniline	NA	3.8	4.8 U	4.8 U
4-Nitrophenol	NA	NA	9.5 U	9.5 U
Acenaphthene	NA	530	0.95 U	0.95 U
Acenaphthylene	NA	NA	0.95 U	0.95 U
Aniline	NA	13	1.9 U	1.9 U
Anthracene	343	1800	0.95 U	0.95 U
Benzidine	NA	0.00011	9.5 U	9.5 U
Benzo(a)anthracene	NA	0.03	0.95 U	0.95 U
Benzo(a)pyrene	0.2	0.025	**0.95 U**	**0.95 U**
Benzo(b)fluoranthene	NA	0.25	0.95 U	0.95 U
Benzo(g,h,i)perylene	NA	NA	0.95 U	0.95 U
Benzo(k)fluoranthene	NA	2.5	0.95 U	0.95 U
Benzoic acid	NA	75000	19 U	19 U
Benzyl Alcohol	NA	2000	1.9 U	1.9 U
bis(2-Chloroethoxy)methane	NA	59	1.9 U	1.9 U
bis(2-Chloroethyl)ether	NA	0.014	1.9 U	1.9 U
bis(2-Ethylhexyl)phthalate	6	5.6	1.9 U	1.9 U
Butyl benzylphthalate	NA	16	1.9 U	1.9 U
Carbazole	NA	NA	0.95 U	0.95 U
Chrysene	NA	25	0.95 U	0.95 U
Dibenz(a,h)anthracene	NA	0.025	0.95 U	0.95 U
Dibenzofuran	NA	7.9	4.8 U	4.8 U
Diethyl phthalate	NA	15000	1.9 U	1.9 U
Dimethyl phthalate	NA	NA	1.9 U	1.9 U
Di-n-butylphthalate	NA	900	1.9 U	1.9 U
Di-n-octyl phthalate	NA	200	1.9 U	1.9 U
Fluoranthene	46	800	0.95 U	0.95 U
Fluorene	46	290	0.95 U	0.95 U
Hexachlorobenzene	1	0.0098	0.95 U	0.95 U
Hexachlorobutadiene	NA	0.14	0.95 U	0.95 U
Hexachlorocyclopentadiene	50	0.41	9.5 U	9.5 U
Hexachloroethane	NA	0.33	1.9 U	1.9 U
Indeno(1,2,3-cd)pyrene	NA	0.25	0.95 U	0.95 U
Isophorone	NA	78	1.9 U	1.9 U
Naphthalene	0.5	0.17	**0.95 U**	**0.95 U**
Nitrobenzene	NA	0.14	1.9 U	1.9 U
N-Nitrosodimethylamine	NA	0.00011	1.9 U	1.9 U
N-Nitrosodi-n-propylamine	NA	0.011	1.9 U	1.9 U

TABLE 5.6-2
AOC 6 - RADIOLOGICAL WASTE BUILDING AND TANKS: GROUNDWATER ANALYTICAL RESULTS COMPARED TO GROUNDWATER ENFORCEMENT STANDARDS
VERMONT YANKEE
VERNON, VERMONT

Location Name Sample Name Sample Date Lab Sample ID	VT ANR Proposed 2019 Groundwater Enforcement	USEPA Tapwater RSL HI = 1.0 May 2019	DP0601 GW0601-20190515 05/15/2019 JC88303-2	DP0602 GW0602-20190515 05/15/2019 JC88303-1
Semi-Volatile Organic Compounds (ug/L) ***(Continued)***				
N-Nitrosodiphenylamine	NA	12	4.8 U	4.8 U
Pentachlorophenol	1	0.041	**3.8 U**	**3.8 U**
Phenanthrene	NA	NA	0.95 U	0.95 U
Phenol	NA	5800	1.9 U	1.9 U
Pyrene	NA	120	0.95 U	0.95 U
Pyridine	NA	20	1.9 U	1.9 U
Inorganic Compounds (ug/L)				
Aluminum, Total	NA	20000	116000	128000
Antimony, Total	NA	7.8	30 U	30 U
Arsenic, Total	10	0.052	**66.5**	**54.5**
Barium, Total	2000	3800	1740	1000 U
Beryllium, Total	4	25	**5 U**	**5 U**
Cadmium, Total	5	9.2	**15 U**	**15 U**
Calcium, Total	NA	NA	652000	117000
Chromium, Total	100	NA	**209**	**220**
Cobalt, Total	NA	6	250 U	250 U
Copper, Total	1300	800	204	205
Iron, Total	NA	14000	170000	171000
Lead, Total	15	15	**62.5**	**56**
Magnesium, Total	NA	NA	88300	50300
Manganese, Total	300	430	**28900**	**32400**
Mercury, Total	NA	0.63	0.2 U	0.21
Nickel, Total	100	390	**222**	**229**
Potassium, Total	NA	NA	50000 U	50000 U
Selenium, Total	50	100	50 U	50 U
Silver, Total	NA	94	50 U	50 U
Sodium, Total	NA	NA	1690000	979000
Thallium, Total	2	0.2	**50 U**	**50 U**
Vanadium, Total	NA	86	250 U	250 U
Zinc, Total	NA	6000	466	527
PCBs (ug/L)				
Aroclor-1016 (PCB-1016)	NA	0.22	0.33 U	0.33 U
Aroclor-1221 (PCB-1221)	NA	0.0047	0.33 U	0.33 U
Aroclor-1232 (PCB-1232)	NA	0.0047	0.33 U	0.33 U
Aroclor-1242 (PCB-1242)	NA	0.0078	0.33 U	0.33 U
Aroclor-1248 (PCB-1248)	NA	0.0078	0.33 U	0.33 U
Aroclor-1254 (PCB-1254)	NA	0.0078	0.33 U	0.33 U
Aroclor-1260 (PCB-1260)	NA	0.0078	0.33 U	0.33 U
Aroclor-1262 (PCB-1262)	NA	NA	0.33 U	0.33 U
Aroclor-1268 (PCB-1268)	NA	NA	0.33 U	0.33 U

ABBREVIATIONS AND NOTES:
-: Not Analyzed
J: valued is estimated
J+: valued is estimated with a potential high bias
mS/cm: milliSiemen per centimeter
mv: millivolt
NA: Not Applicable
NTU: Nephelometric Turbidity Units
RSL: Risk-Based Screening Levels
U: Not detected, value is the laboratory reporting limit
ug/L: microgram per liter
USEPA: United States Environmental Protection Agency
VT ANR: Vermont Agency of Natural Resources

- Volatile and Semi-Volatile analytes detected in at least one sample are reported herein. For a complete list of analytes see the laboratory data sheets.
- Bold values indicate an exceedance of the VT ANR Proposed 2019 Groundwater Enforcement Standard.

TABLE 5.7-1
AOC 7 - FUEL STORAGE TANKS: SOIL ANALYTICAL RESULTS COMPARED TO RESIDENTIAL AND NON-RESIDENTIAL SOIL CRITERIA
VERMONT YANKEE
VERNON, VERMONT

Location Name	VT ANR	VT ANR 2019	USEPA RSL	USEPA RSL	DP0701	DP0701	DP0702	DP0702	DP0703	DP0703	DP0704	DP0704	DP0704	DP0705	DP0705	DP0706	DP0706	DP0707	DP0707	DP0708	DP0708	SS0701	SS0702	SS0703	SS0704	SS0705	SS0705
Sample Name	2019	Proposed	Residential	Industrial	DP070101	DP070108	DP070201	DP070208	DP070301	DP070322	DP070401	DP070416	DP070421	DP070501	DP070518	DP070601	DP070626	DP070701	DP070729	DP070801	DP070823	SS070100	SS070200	SS070300	SS070400	SS070500	SS070500DUP
Sample Date	Proposed	Non-	Soil	Soil	05/01/2019	05/01/2019	05/01/2019	05/01/2019	05/02/2019	05/02/2019	05/02/2019	05/02/2019	05/02/2019	05/02/2019	05/02/2019	04/25/2019	04/25/2019	04/25/2019	04/25/2019	04/25/2019	04/25/2019	05/16/2019	05/16/2019	05/16/2019	05/16/2019	04/25/2019	04/25/2019
Lab Sample ID	Residential	Residential	HI = 1.0	HI = 1.0	JC87364-3	JC87364-4	JC87364-7	JC87364-8	JC87450-9	JC87450-10	JC87450-7	JC87450-8	JC87450-15	JC87563-4	JC87563-3	JC86994-15	JC86994-16	JC86994-17	JC86994-18	JC86994-19	JC86994-20	JC88412-3	JC88412-4	JC88412-5	JC88412-6	JC86994-23	JC86994-25
Sample Depth (bgs)	Soil	Soil	May 2019	May 2019	0 - 1 (ft)	8 - 10 (ft)	0 - 1 (ft)	8 - 10 (ft)	0 - 1 (ft)	22 - 24 (ft)	0 - 1 (ft)	16 - 18 (ft)	21 - 23 (ft)	0 - 1 (ft)	18 - 20 (ft)	1 - 1.5 (ft)	26 - 27 (ft)	1 - 1.5 (ft)	29 - 30 (ft)	0 - 0.5 (ft)	23 - 24 (ft)	0 - 0.5 (ft)	0 - 0.5 (ft)	0 - 0.5 (ft)	0 - 0.5 (ft)	0 - 0.5 (ft)	0 - 0.5 (ft)
Volatile Organic Compounds (mg/kg)																											
1,1,1,2-Tetrachloroethane	1.3	8	2	8.8	0.0019 U	0.0018 U	0.0023 U	0.0023 U	0.0019 U	0.0023 U	0.0021 U	0.0022 U	0.0018 U	0.0024 U	0.0019 U	0.0026 U	0.0028 U	0.0022 U	0.0025 U	0.0026 U	0.0021 U	0.0023 U	0.0025 U	0.0021 U	0.0025 U	**2.6 U**	**2.9 U**
1,1,1-Trichloroethane	NA	NA	8100	36000	0.0019 U	0.0018 U	0.0023 U	0.0023 U	0.0019 U	0.0023 U	0.0021 U	0.0022 U	0.0018 U	0.0024 U	0.0019 U	0.0026 U	0.0028 U	0.0022 U	0.0025 U	0.0026 U	0.0021 U	0.0023 U	0.0025 U	0.0021 U	0.0025 U	2.6 U	2.9 U
1,1,2,2-Tetrachloroethane	NA	NA	0.6	2.7	0.0019 U	0.0018 U	0.0023 U	0.0023 U	0.0019 U	0.0023 U	0.0021 U	0.0022 U	0.0018 U	0.0024 U	0.0019 U	0.0026 U	0.0028 U	0.0022 U	0.0025 U	0.0026 U	0.0021 U	0.0023 U	0.0025 U	0.0021 U	0.0025 U	**2.6 U**	***2.9 U***
1,1,2-Trichloroethane	NA	NA	1.1	5	0.0019 U	0.0018 U	0.0023 U	0.0023 U	0.0019 U	0.0023 U	0.0021 U	0.0022 U	0.0018 U	0.0024 U	0.0019 U	0.0026 U	0.0028 U	0.0022 U	0.0025 U	0.0026 U	0.0021 U	0.0023 U	0.0025 U	0.0021 U	0.0025 U	**2.6 U**	**2.9 U**
1,1-Dichloroethane	2.1	13	3.6	16	0.00095 U	0.00092 U	0.0011 U	0.0011 U	0.00096 U	0.0012 U	0.001 U	0.0011 U	0.00088 U	0.0012 U	0.00095 U	0.0013 U	0.0014 U	0.0011 U	0.0013 U	0.0013 U	0.0011 U	0.0011 U	0.0012 U	0.001 U	0.0012 U	1.3 U	1.4 U
1,1-Dichloroethene	NA	NA	230	1000	0.00095 U	0.00092 U	0.0011 U	0.0011 U	0.00096 U	0.0012 U	0.001 U	0.0011 U	0.00088 U	0.0012 U	0.00095 U	0.0013 U	0.0014 U	0.0011 U	0.0013 U	0.0013 U	0.0011 U	0.0011 U	0.0012 U	0.001 U	0.0012 U	1.3 U	1.4 U
1,1-Dichloropropene	NA	NA	NA	NA	0.0019 U	0.0018 U	0.0023 U	0.0023 U	0.0019 U	0.0023 U	0.0021 U	0.0022 U	0.0018 U	0.0024 U	0.0019 U	0.0026 U	0.0028 U	0.0022 U	0.0025 U	0.0026 U	0.0021 U	0.0023 U	0.0025 U	0.0021 U	0.0025 U	2.6 U	2.9 U
1,2,3-Trichlorobenzene	NA	NA	63	930	0.0047 U	0.0046 U	0.0057 U	0.0057 U	0.0048 U	0.0059 U	0.0052 U	0.0055 U	0.0044 U	0.0059 U	0.0048 U	0.0065 U	0.007 U	0.0056 U	0.0063 U	0.0064 U	0.0053 U	0.0057 U	0.0062 U	0.0052 U	0.0062 U	6.6 U	7.2 U
1,2,3-Trichloropropane	0.00311	0.07	0.0051	0.11	**0.0047 U**	**0.0046 U**	**0.0057 U**	**0.0057 U**	**0.0048 U**	**0.0059 U**	**0.0052 U**	**0.0055 U**	**0.0044 U**	**0.0059 U**	**0.0048 U**	**0.0065 U**	**0.007 U**	**0.0056 U**	**0.0063 U**	**0.0064 U**	**0.0053 U**	**0.0057 U**	**0.0062 U**	**0.0052 U**	**0.0062 U**	***6.6 U***	***7.2 U***
1,2,4-Trichlorobenzene	NA	NA	24	110	0.0047 U	0.0046 U	0.0057 U	0.0057 U	0.0048 U	0.0059 U	0.0052 U	0.0055 U	0.0044 U	0.0059 U	0.0048 U	0.0065 U	0.007 U	0.0056 U	0.0063 U	0.0064 U	0.0053 U	0.0057 U	0.0062 U	0.0052 U	0.0062 U	6.6 U	7.2 U
1,2,4-Trimethylbenzene	144	177	300	1800	0.0019 U	0.0018 U	0.0023 U	0.0023 U	0.0019 U	0.0023 U	0.0021 U	0.0351	0.002	0.0024 U	0.0019 U	0.0026 U	0.0028 U	0.0022 U	0.0025 U	0.0026 U	0.0021 U	0.0023 U	0.0025 U	0.0021 U	0.0025 U	***351***	***449***
1,2-Dibromo-3-chloropropane (DBCP)	0.01	0.06	0.0053	0.064	0.0019 U	0.0018 U	0.0023 U	0.0023 U	0.0019 U	0.0023 U	0.0021 U	0.0022 U	0.0018 U	0.0024 U	0.0019 U	0.0026 U	0.0028 U	0.0022 U	0.0025 U	0.0026 U	0.0021 U	0.0023 U	0.0025 U	0.0021 U	0.0025 U	***2.6 U***	***2.9 U***
1,2-Dibromoethane (Ethylene Dibromide)	0.02	0.14	0.036	0.16	0.00095 U	0.00092 U	0.0011 U	0.0011 U	0.00096 U	0.0012 U	0.001 U	0.0011 U	0.00088 U	0.0012 U	0.00095 U	0.0013 U	0.0014 U	0.0011 U	0.0013 U	0.0013 U	0.0011 U	0.0011 U	0.0012 U	0.001 U	0.0012 U	***1.3 U***	***1.4 U***
1,2-Dichlorobenzene	NA	NA	1800	9300	0.00095 U	0.00092 U	0.0011 U	0.0011 U	0.00096 U	0.0012 U	0.001 U	0.0011 U	0.00088 U	0.0012 U	0.00095 U	0.0013 U	0.0014 U	0.0011 U	0.0013 U	0.0013 U	0.0011 U	0.0011 U	0.0012 U	0.001 U	0.0012 U	1.3 U	1.4 U
1,2-Dichloroethane	0.29	1.7	0.46	2	0.00095 U	0.00092 U	0.0011 U	0.0011 U	0.00096 U	0.0012 U	0.001 U	0.0011 U	0.00088 U	0.0012 U	0.00095 U	0.0013 U	0.0014 U	0.0011 U	0.0013 U	0.0013 U	0.0011 U	0.0011 U	0.0012 U	0.001 U	0.0012 U	**1.3 U**	**1.4 U**
1,2-Dichloropropane	1.5	9.1	2.5	11	0.0019 U	0.0018 U	0.0023 U	0.0023 U	0.0019 U	0.0023 U	0.0021 U	0.0022 U	0.0018 U	0.0024 U	0.0019 U	0.0026 U	0.0028 U	0.0022 U	0.0025 U	0.0026 U	0.0021 U	0.0023 U	0.0025 U	0.0021 U	0.0025 U	**2.6 U**	**2.9 U**
1,3,5-Trimethylbenzene	144	177	270	1500	0.0019 U	0.0018 U	0.0023 U	0.0023 U	0.0019 U	0.0023 U	0.0021 U	0.019	0.0013 J	0.0024 U	0.0019 U	0.0026 U	0.0028 U	0.0022 U	0.0025 U	0.0026 U	0.0021 U	0.0023 U	0.0025 U	0.0021 U	0.0025 U	99.2	138
1,3-Dichlorobenzene	NA	NA	NA	NA	0.00095 U	0.00092 U	0.0011 U	0.0011 U	0.00096 U	0.0012 U	0.001 U	0.0011 U	0.00088 U	0.0012 U	0.00095 U	0.0013 U	0.0014 U	0.0011 U	0.0013 U	0.0013 U	0.0011 U	0.0011 U	0.0012 U	0.001 U	0.0012 U	1.3 U	1.4 U
1,3-Dichloropropane	NA	NA	1600	23000	0.0019 U	0.0018 U	0.0023 U	0.0023 U	0.0019 U	0.0023 U	0.0021 U	0.0022 U	0.0018 U	0.0024 U	0.0019 U	0.0026 U	0.0028 U	0.0022 U	0.0025 U	0.0026 U	0.0021 U	0.0023 U	0.0025 U	0.0021 U	0.0025 U	2.6 U	2.9 U
1,4-Dichlorobenzene	NA	NA	2.6	11	0.00095 U	0.00092 U	0.0011 U	0.0011 U	0.00096 U	0.0012 U	0.001 U	0.0011 U	0.00088 U	0.0012 U	0.00095 U	0.0013 U	0.0014 U	0.0011 U	0.0013 U	0.0013 U	0.0011 U	0.0011 U	0.0012 U	0.001 U	0.0012 U	1.3 U	1.4 U
2,2-Dichloropropane	NA	NA	NA	NA	0.0019 U	0.0018 U	0.0023 U	0.0023 U	0.0019 U	0.0023 U	0.0021 U	0.0022 U	0.0018 U	0.0024 U	0.0019 U	0.0026 U	0.0028 U	0.0022 U	0.0025 U	0.0026 U	0.0021 U	0.0023 U	0.0025 U	0.0021 U	0.0025 U	2.6 U	2.9 U
2-Butanone (Methyl Ethyl Ketone)	16952	26991	27000	190000	0.0095 U	0.0092 U	0.011 U	0.011 U	0.0096 U	0.012 U	0.01 U	0.011 U	0.0088 U	0.012 U	0.0095 U	0.013 U	0.014 U	0.011 U	0.013 U	0.013 U	0.011 U	0.011 U	0.012 U	0.01 U	0.012 U	13 U	14 U
2-Chlorotoluene	NA	NA	1600	23000	0.0019 U	0.0018 U	0.0023 U	0.0023 U	0.0019 U	0.0023 U	0.0021 U	0.0022 U	0.0018 U	0.0024 U	0.0019 U	0.0026 U	0.0028 U	0.0022 U	0.0025 U	0.0026 U	0.0021 U	0.0023 U	0.0025 U	0.0021 U	0.0025 U	2.6 U	2.9 U
2-Phenylbutane (sec-Butylbenzene)	7009	102200	7800	120000	0.0019 U	0.0018 U	0.0023 U	0.0023 U	0.0019 U	0.0023 U	0.0021 U	0.0042	0.00071 J	0.0024 U	0.0019 U	0.0026 U	0.0028 U	0.0022 U	0.0025 U	0.0026 U	0.0021 U	0.0023 U	0.0025 U	0.0021 U	0.0025 U	21	26.9
4-Chlorotoluene	NA	NA	1600	23000	0.0019 U	0.0018 U	0.0023 U	0.0023 U	0.0019 U	0.0023 U	0.0021 U	0.0022 U	0.0018 U	0.0024 U	0.0019 U	0.0026 U	0.0028 U	0.0022 U	0.0025 U	0.0026 U	0.0021 U	0.0023 U	0.0025 U	0.0021 U	0.0025 U	2.6 U	2.9 U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	NA	NA	33000	140000	0.0047 U	0.0046 U	0.0057 U	0.0057 U	0.0048 U	0.0059 U	0.0052 U	0.0055 U	0.0044 U	0.0059 U	0.0048 U	0.0065 U	0.007 U	0.0056 U	0.0063 U	0.0064 U	0.0053 U	0.0057 U	0.0062 U	0.0052 U	0.0062 U	6.6 U	7.2 U
Acetone	40609	100028	61000	670000	0.0348 J+	0.0105 UJ	0.0189 UJ	0.0151 UJ	0.0096 U	0.0191	0.01 U	0.011 U	0.016	0.012 U	0.0095 U	0.0573 J	0.0619 J	0.011 UJ	0.0326 J	0.083 J	0.0317 J	0.0314 J+	0.012 U	0.01 U	0.012 U	13 UJ	14 UJ
Benzene	0.7	4.2	1.2	5.1	0.00047 U	0.00046 U	0.00057 U	0.00051 J	0.00048 U	0.00059 U	0.00052 U	0.00055 U	0.00044 U	0.00059 U	0.00048 U	0.00065 U	0.0007 U	0.00056 U	0.00063 U	0.00064 U	0.00053 U	0.00057 U	0.00062 U	0.00052 U	0.00062 U	0.66 U	**0.72 U**
Bromobenzene	NA	NA	290	1800	0.0047 U	0.0046 U	0.0057 U	0.0057 U	0.0048 U	0.0059 U	0.0052 U	0.0055 U	0.0044 U	0.0059 U	0.0048 U	0.0065 U	0.007 U	0.0056 U	0.0063 U	0.0064 U	0.0053 U	0.0057 U	0.0062 U	0.0052 U	0.0062 U	6.6 U	7.2 U
Bromodichloromethane	NA	NA	0.29	1.3	0.0019 U	0.0018 U	0.0023 U	0.0023 U	0.0019 U	0.0023 U	0.0021 U	0.0022 U	0.0018 U	0.0024 U	0.0019 U	0.0026 U	0.0028 U	0.0022 U	0.0025 U	0.0026 U	0.0021 U	0.0023 U	0.0025 U	0.0021 U	0.0025 U	***2.6 U***	***2.9 U***
Bromoform	NA	NA	19	86	0.0047 U	0.0046 U	0.0057 U	0.0057 U	0.0048 U	0.0059 U	0.0052 U	0.0055 U	0.0044 U	0.0059 U	0.0048 U	0.0065 U	0.007 U	0.0056 U	0.0063 U	0.0064 U	0.0053 U	0.0057 U	0.0062 U	0.0052 U	0.0062 U	6.6 U	7.2 U
Bromomethane (Methyl Bromide)	NA	NA	6.8	30	0.0047 U	0.0046 U	0.0057 U	0.0057 U	0.0048 U	0.0059 U	0.0052 U	0.0055 U	0.0044 U	0.0059 U	0.0048 U	0.0065 U	0.007 U	0.0056 U	0.0063 U	0.0064 U	0.0053 U	0.0057 U	0.0062 U	0.0052 U	0.0062 U	6.6 U	**7.2 U**
Carbon tetrachloride	0.37	2.2	0.65	2.9	0.0019 U	0.0018 U	0.0023 U	0.0023 U	0.0019 U	0.0023 U	0.0021 U	0.0022 U	0.0018 U	0.0024 U	0.0019 U	0.0026 U	0.0028 U	0.0022 U	0.0025 U	0.0026 U	0.0021 U	0.0023 U	0.0025 U	0.0021 U	0.0025 U	***2.6 U***	***2.9 U***
Chlorobenzene	414	726	280	1300	0.0019 U	0.0018 U	0.0023 U	0.0023 U	0.0019 U	0.0023 U	0.0021 U	0.0022 U	0.0018 U	0.0024 U	0.0019 U	0.0026 U	0.0028 U	0.0022 U	0.0025 U	0.0026 U	0.0021 U	0.0023 U	0.0025 U	0.0021 U	0.0025 U	2.6 U	2.9 U
Chlorobromomethane	193	597	150	630	0.0047 U	0.0046 U	0.0057 U	0.0057 U	0.0048 U	0.0059 U	0.0052 U	0.0055 U	0.0044 U	0.0059 U	0.0048 U	0.0065 U	0.007 U	0.0056 U	0.0063 U	0.0064 U	0.0053 U	0.0057 U	0.0062 U	0.0052 U	0.0062 U	6.6 U	7.2 U
Chloroethane	NA	NA	14000	57000	0.0047 U	0.0046 U	0.0057 U	0.0057 U	0.0048 U	0.0059 U	0.0052 U	0.0055 U	0.0044 U	0.0059 U	0.0048 U	0.0065 U	0.007 U	0.0056 U	0.0063 U	0.0064 U	0.0053 U	0.0057 U	0.0062 U	0.0052 U	0.0062 U	6.6 U	7.2 U
Chloroform (Trichloromethane)	NA	NA	0.32	1.4	0.0019 U	0.0018 U	0.0023 U	0.0023 U	0.0019 U	0.0023 U	0.0021 U	0.0022 U	0.0018 U	0.0024 U	0.0019 U	0.0026 U	0.0028 U	0.0022 U	0.0025 U	0.0026 U	0.0021 U	0.0023 U	0.0025 U	0.0021 U	0.0025 U	***2.6 U***	***2.9 U***
Chloromethane (Methyl Chloride)	NA	NA	110	460	0.0047 U	0.0046 U	0.0057 U	0.0057 U	0.0048 U	0.0059 U	0.0052 U	0.0055 U	0.0044 U	0.0059 U	0.0048 U	0.0065 U	0.007 U	0.0056 U	0.0063 U	0.0064 U	0.0053 U	0.0057 U	0.0062 U	0.0052 U	0.0062 U	6.6 U	7.2 U
cis-1,2-Dichloroethene	140	1814	160	2300	0.00095 U	0.00092 U	0.0011 U	0.0011 U	0.00096 U	0.0012 U	0.001 U	0.0011 U	0.00088 U	0.0012 U	0.00095 U	0.0013 U	0.0014 U	0.0011 U	0.0013 U	0.0013 U	0.0011 U	0.0011 U	0.0012 U	0.001 U	0.0012 U	1.3 U	1.4 U
cis-1,3-Dichloropropene	NA	NA	NA	NA	0.0019 U	0.0018 U	0.0023 U	0.0023 U	0.0019 U	0.0023 U	0.0021 U	0.0022 U	0.0018 U	0.0024 U	0.0019 U	0.0026 U	0.0028 U	0.0022 U	0.0025 U	0.0026 U	0.0021 U	0.0023 U	0.0025 U	0.0021 U	0.0025 U	2.6 U	2.9 U
Cymene (p-Isopropyltoluene)	NA	NA	NA	NA	0.0019 U	0.0018 U	0.0023 U	0.0023 U	0.0019 U	0.0023 U	0.0021 U	0.0069	0.0011 J	0.0024 U	0.0019 U	0.0026 U	0.0028 U	0.0022 U	0.0025 U	0.0026 U	0.0021 U	0.0023 U	0.0025 U	0.0021 U	0.0025 U	20.4	26
Dibromochloromethane	NA	NA	8.3	39	0.0019 U	0.0018 U	0.0023 U	0.0023 U	0.0019 U	0.0023 U	0.0021 U	0.0022 U	0.0018 U	0.0024 U	0.0019 U	0.0026 U	0.0028 U	0.0022 U	0.0025 U	0.0026 U	0.0021 U	0.0023 U	0.0025 U	0.0021 U	0.0025 U	2.6 U	2.9 U
Dibromomethane	NA	NA	24	99	0.0047 U	0.0046 U	0.0057 U	0.0057 U	0.0048 U	0.0059 U	0.0052 U	0.0055 U	0.0044 U	0.0059 U	0.0048 U	0.0065 U	0.007 U	0.0056 U	0.0063 U	0.0064 U	0.0053 U	0.0057 U	0.0062 U	0.0052 U	0.0062 U	6.6 U	7.2 U
Dichlorodifluoromethane (CFC-12)	NA	NA	87	370	0.0047 U	0.0046 U	0.0057 U	0.0057 U	0.0048 U	0.0059 U	0.0052 U	0.0055 U	0.0044 U	0.0059 U	0.0048 U	0.0065 U	0.007 U	0.0056 U	0.0063 U	0.0064 U	0.0053 U	0.0057 U	0.0062 U	0.0052 U	0.0062 U	6.6 U	7.2 U
Ethylbenzene	3.7	22	5.8	25	0.00095 U	0.00092 U	0.0011 U	0.0011 U	0.00096 U	0.0012 U	0.001 U	0.0011 U	0.00088 U	0.0012 U	0.00095 U	0.0013 U	0.0014 U	0.0011 U	0.0013 U	0.0013 U	0.0011 U	0.0011 U	0.0012 U	0.001 U	0.0012 U	**12**	**11.6**
Hexachlorobutadiene	NA	NA	1.2	5.3	0.0047 U	0.0046 U	0.0057 U	0.0057 U	0.0048 U	0.0059 U	0.0052 U	0.0055 U	0.0044 U	0.0059 U	0.0048 U	0.0065 U	0.007 U	0.0056 U	0.0063 U	0.0064 U	0.0053 U	0.0057 U	0.0062 U	0.0052 U	0.0062 U	***6.6 U***	***7.2 U***
Isopropylbenzene (Cumene)	256	264	1900	9900	0.0019 U	0.0018 U	0.0023 U	0.0023 U	0.0019 U	0.0023 U	0.0021 U	0.0022 U	0.0018 U	0.0024 U	0.0019 U	0.0026 U	0.0028 U	0.0022 U	0.0025 U	0.0026 U	0.0021 U	0.0023 U	0.0025 U	0.0021 U	0.0025 U	12.3	17.1
m,p-Xylenes	NA	NA	NA	NA	0.00095 U	0.00092 U	0.0011 U	0.0011 U	0.00096 U	0.0012 U	0.001 U	0.0011 U	0.00088 U	0.0012 U	0.00095 U	0.0013 U	0.0014 U	0.0011 U	0.0013 U	0.0013 U	0.0011 U	0.0011 U	0.0012 U	0.001 U	0.0012 U	94.8	146
Methyl Tert Butyl Ether	649	4464	47	210	0.00095 U	0.00092 U	0.0011 U	0.0011 U	0.00096 U	0.0012 U	0.001 U	0.0011 U	0.00088 U	0.0012 U	0.00095 U	0.0013 U	0.0014 U	0.0011 U	0.0013 U	0.0013 U	0.0011 U	0.0011 U	0.0012 U	0.001 U	0.0012 U	1.3 U	1.4 U
Methylene chloride	NA	NA	57	1000	0.0047 U	0.0046 U	0.0057 U	0.0057 U	0.0048 U	0.0059 U	0.0052 U	0.0011 J	0.0044 U	0.0059 U	0.0048 U	0.0065 U	0.007 U	0.0056 U	0.0063 U	0.0064 U	0.0053 U	0.0057 U	0.0062 U	0.0052 U	0.0062 U	6.6 U	7.2 U
Naphthalene	2.7	16	3.8	17	0.0047 U	0.0046 U	0.0057 U	0.0057 U	0.0048 U	0.0059 U	0.0052 U	0.0108	0.0044 U	0.0059 U	0.0048 U	0.0065 U	0.007 U	0.0056 U	0.0063 U	0.0064 U	0.0053 U	0.0057 U	0.0062 U	0.0052 U	0.0062 U	***19.7***	**15**
n-Butylbenzene	3504	51100	3900	58000	0.0019 U	0.0018 U	0.0023 U	0.0023 U	0.0019 U	0.0023 U	0.0021 U	0.0025	0.00047 J	0.0024 U	0.0019 U	0.0026 U	0.0028 U	0.0022 U	0.0025 U	0.0026 U	0.0021 U	0.0023 U	0.0025 U	0.0021 U	0.0025 U	34.6	41
n-Propylbenzene	253	261	3800	24000	0.0019 U	0.0018 U	0.0023 U	0.0023 U	0.0019 U	0.0023 U	0.0021 U	0.0023	0.0018 U	0.0024 U	0.0019 U	0.0026 U	0.0028 U	0.0022 U	0.0025 U	0.0026 U	0.0021 U	0.0023 U	0.0025 U	0.0021 U	0.0025 U	31.3	39.4
o-Xylene	NA	NA	650	2800	0.00095 U	0.00092 U	0.0011 U	0.0011 U	0.00096 U	0.0012 U	0.001 U	0.0011 U	0.00088 U	0.0012 U	0.00095 U	0.0013 U	0.0014 U	0.0011 U	0.0013 U	0.0013 U	0.0011 U	0.0011 U	0.0012 U	0.001 U	0.0012 U	66.2	94.1
Styrene	NA	NA	6000	35000	0.0019 U	0.0018 U	0.0023 U	0.0023 U	0.0019 U	0.0023 U	0.0021 U	0.0022 U	0.0018 U	0.0024 U	0.0019 U	0.0026 U	0.0028 U	0.0022 U	0.0025 U	0.0026 U	0.0021 U	0.0023 U	0.0025 U	0.0021 U	0.0025 U	2.6 U	2.9 U
tert-Butylbenzene	7009	102200	7800	120000	0.0019 U	0.0018 U	0.0023 U	0.0023 U	0.0019 U	0.0023 U	0.0021 U	0.0013 J	0.0018 U	0.0024 U	0.0019 U	0.0026 U	0.0028 U	0.0022 U	0.0025 U	0.0026 U	0.0021 U	0.0023 U	0.0025 U	0.0021 U	0.0025 U	0.888 J	1.08 J
Tetrachloroethene	2.4	14	24	100	0.0019 U	0.0018 U	0.0023 U	0.0023 U	0.0019 U	0.0023 U	0.0021 U	0.0022 U	0.0018 U	0.0024 U	0.0019 U	0.0026 U	0.0028 U	0.0022 U	0.0025 U	0.0026 U	0.0021 U	0.0023 U	0.0025 U	0.0021 U	0.0025 U	**2.6 U**	**2.9 U**
Toluene	706	798	4900	47000	0.00095 U	0.00092 U	0.0011 U	0.0011 U	0.00096 U	0.0012 U	0.001 U	0.0011 U	0.00088 U	0.0012 U	0.00095 U	0.0013 U	0.0014 U	0.0011 U	0.0013 U	0.0013 U	0.0011 U	0.0011 U	0.0012 U	0.001 U	0.0012 U	7.55	8.65
trans-1,2-Dichloroethene	1402	18137	1600	23000	0.00095 U	0.00092 U	0.0011 U	0.0011 U	0.00096 U	0.0012 U	0.001 U	0.0011 U	0.00088 U	0.0012 U	0.00095 U	0.0013 U	0.0014 U	0.0011 U	0.0013 U	0.0013 U	0.0011 U	0.0011 U	0.0012 U	0.001 U	0.0012 U	1.3 U	1.4 U
trans-1,3-Dichloropropene	NA	NA	NA	NA	0.0019 U	0.0018 U	0.0023 U	0.0023 U	0.0019 U	0.0023 U	0.0021 U	0.0022 U	0.0018 U	0.0024 U	0.0019 U	0.0026 U	0.0028 U	0.0022 U	0.0025 U	0.0026 U	0.0021 U	0.0023 U	0.0025 U	0.0021 U	0.0025 U	2.6 U	2.9 U
Trichloroethene	0.68	6.5	0.94	6	0.00095 U	0.00092 U	0.0011 U	0.0011 U	0.00096 U	0.0012 U	0.001 U	0.0011 U	0.00088 U	0.0012 U	0.00095 U	0.0013 U	0.0014 U	0.0011 U	0.0013 U	0.0013 U	0.0011 U	0.0011 U	0.0012 U	0.001 U	0.0012 U	**1.3 U**	**1.4 U**
Trichlorofluoromethane (CFC-11)	NA	NA	23000	350000	0.0047 U	0.0046 U	0.0057 U	0.0057 U	0.0048 U	0.0059 U	0.0052 U	0.0055 U	0.0044 U	0.0059 U	0.0048 U	0.0065 U	0.007 U	0.0056 U	0.0063 U	0.0064 U	0.0053 U	0.0057 U	0.0062 U	0.0052 U	0.0062 U	6.6 U	7.2 U
Vinyl chloride	0.1	0.59	0.059	1.7	0.0019 U	0.0018 U	0.0023 U	0.0023 U	0.0019 U	0.0023 U	0.0021 U	0.0022 U	0.0018 U	0.0024 U	0.0019 U	0.0026 U	0.0028 U	0.0022 U	0.0025 U	0.0026 U	0.0021 U	0.0023 U	0.0025 U	0.0021 U	0.0025 U	***2.6 U***	***2.9 U***
Xylene (total)	252	257	580	2500	0.00095 U	0.00092 U	0.0011 U	0.0011 U	0.00096 U	0.0012 U	0.001 U	0.0011 U	0.00088 U	0.0012 U	0.00095 U	0.0013 U	0.0014 U	0.0011 U	0.0013 U	0.0013 U	0.0011 U	0.0011 U	0.0012 U	0.001 U	0.0012 U	161	240

TABLE 5.7-1
AOC 7 - FUEL STORAGE TANKS: SOIL ANALYTICAL RESULTS COMPARED TO RESIDENTIAL AND NON-RESIDENTIAL SOIL CRITERIA
VERMONT YANKEE
VERNON, VERMONT

Location Name	VT ANR	VT ANR 2019	USEPA RSL	USEPA RSL	DP0701	DP0701	DP0702	DP0702	DP0703	DP0703	DP0704	DP0704	DP0704	DP0705	DP0705	DP0706	DP0706	DP0707	DP0707	DP0708	DP0708	SS0701	SS0702	SS0703	SS0704	SS0705	SS0705
Sample Name	2019	Proposed	Residential	Industrial	DP070101	DP070108	DP070201	DP070208	DP070301	DP070322	DP070401	DP070416	DP070421	DP070501	DP070518	DP070601	DP070626	DP070701	DP070729	DP070801	DP070823	SS070100	SS070200	SS070300	SS070400	SS070500	SS070500DUP
Sample Date	Proposed	Non-	Soil	Soil	05/01/2019	05/01/2019	05/01/2019	05/01/2019	05/02/2019	05/02/2019	05/02/2019	05/02/2019	05/02/2019	05/02/2019	05/02/2019	04/25/2019	04/25/2019	04/25/2019	04/25/2019	04/25/2019	04/25/2019	05/16/2019	05/16/2019	05/16/2019	05/16/2019	04/25/2019	04/25/2019
Lab Sample ID	Residential	Residential	HI = 1.0	HI = 1.0	JC87364-3	JC87364-4	JC87364-7	JC87364-8	JC87450-9	JC87450-10	JC87450-7	JC87450-8	JC87450-15	JC87563-4	JC87563-3	JC86994-15	JC86994-16	JC86994-17	JC86994-18	JC86994-19	JC86994-20	JC88412-3	JC88412-4	JC88412-5	JC88412-6	JC86994-23	JC86994-25
Sample Depth (bgs)	Soil	Soil	May 2019	May 2019	0 - 1 (ft)	8 - 10 (ft)	0 - 1 (ft)	8 - 10 (ft)	0 - 1 (ft)	22 - 24 (ft)	0 - 1 (ft)	16 - 18 (ft)	21 - 23 (ft)	0 - 1 (ft)	18 - 20 (ft)	1 - 1.5 (ft)	26 - 27 (ft)	1 - 1.5 (ft)	29 - 30 (ft)	0 - 0.5 (ft)	23 - 24 (ft)	0 - 0.5 (ft)	0 - 0.5 (ft)	0 - 0.5 (ft)	0 - 0.5 (ft)	0 - 0.5 (ft)	0 - 0.5 (ft)
Semi-Volatile Organic Compounds (mg/kg)																											
Acenaphthene	NA	NA	3600	45000	0.04 U	0.037 U	0.042 U	0.038 U	0.035 U	0.037 U	0.036 U	0.042 U	0.036 U	0.039 U	0.037 U	0.037 U	0.034 U	0.039 U	0.042 U	0.04 U	0.038 U	0.037 U	0.038 U	0.038 U	0.036 UJ	0.41 U	0.41 U
Acenaphthylene	NA	NA	NA	NA	0.04 U	0.037 U	0.042 U	0.038 U	0.035 U	0.037 U	0.036 U	0.042 U	0.036 U	0.039 U	0.037 U	0.037 U	0.034 U	0.039 U	0.042 U	0.04 U	0.038 U	0.037 U	0.038 U	0.038 U	0.036 UJ	0.41 U	0.41 U
Anthracene	NA	NA	18000	230000	0.04 U	0.037 U	0.042 U	0.038 U	0.035 U	0.037 U	0.036 U	0.042 U	0.036 U	0.039 U	0.037 U	0.037 U	0.034 U	0.039 U	0.042 U	0.04 U	0.038 U	0.037 U	0.038 U	0.038 U	0.036 UJ	0.41 U	0.41 U
Benzo(a)anthracene	NA	NA	1.1	21	0.04 U	0.037 U	0.042 U	0.038 U	0.035 U	0.037 U	0.036 U	0.042 U	0.036 U	0.0159 J	0.0148 J	0.037 U	0.034 U	0.039 U	0.042 U	0.04 U	0.038 U	0.0502	0.0306 J	0.0217 J	0.036 UJ	0.41 U	0.128 J
Benzo(a)pyrene	0.07	1.54	0.11	2.1	0.04 U	0.037 U	0.042 U	0.038 U	0.035 U	0.037 U	0.036 U	0.042 U	0.036 U	0.039 U	0.037 U	0.037 U	0.034 U	0.039 U	0.042 U	0.04 U	0.038 U	0.0635	0.0198 J	0.0221 J	0.036 UJ	**0.41 U**	**0.41 U**
Benzo(b)fluoranthene	NA	NA	1.1	21	0.04 U	0.037 U	0.042 U	0.038 U	0.035 U	0.037 U	0.036 U	0.042 U	0.036 U	0.0188 J	0.037 U	0.037 U	0.034 U	0.039 U	0.042 U	0.04 U	0.038 U	0.0823	0.0367 J	0.031 J	0.036 UJ	0.41 U	0.41 U
Benzo(g,h,i)perylene	NA	NA	NA	NA	0.04 U	0.037 U	0.042 U	0.038 U	0.035 U	0.037 U	0.036 U	0.042 U	0.036 U	0.039 U	0.037 U	0.037 U	0.034 U	0.039 U	0.042 U	0.04 U	0.038 U	0.0547	0.038 U	0.038 U	0.036 UJ	0.41 U	0.41 U
Benzo(k)fluoranthene	NA	NA	11	210	0.04 U	0.037 U	0.042 U	0.038 U	0.035 U	0.037 U	0.036 U	0.042 U	0.036 U	0.039 U	0.037 U	0.037 U	0.034 U	0.039 U	0.042 U	0.04 U	0.038 U	0.0318 J	0.038 U	0.038 U	0.036 UJ	0.41 U	0.41 U
Chrysene	NA	NA	110	2100	0.04 U	0.037 U	0.042 U	0.038 U	0.035 U	0.037 U	0.036 U	0.042 U	0.036 U	0.0169 J	0.037 U	0.037 U	0.034 U	0.039 U	0.042 U	0.04 U	0.038 U	0.0469	0.0353 J	0.0254 J	0.036 UJ	0.41 U	0.233 J
Dibenz(a,h)anthracene	NA	NA	0.11	2.1	0.04 U	0.037 U	0.042 U	0.038 U	0.035 U	0.037 U	0.036 U	0.042 U	0.036 U	0.039 U	0.037 U	0.037 U	0.034 U	0.039 U	0.042 U	0.04 U	0.038 U	0.037 U	0.038 U	0.038 U	0.036 UJ	**0.41 U**	**0.41 U**
Fluoranthene	2301	26371	2400	30000	0.04 U	0.037 U	0.042 U	0.038 U	0.035 U	0.037 U	0.036 U	0.042 U	0.036 U	0.0351 J	0.0295 J	0.037 U	0.034 U	0.039 U	0.042 U	0.04 U	0.038 U	0.0748	0.0514	0.0494	0.036 UJ	0.41 U	0.41 U
Fluorene	2301	26371	2400	30000	0.04 U	0.037 U	0.042 U	0.038 U	0.035 U	0.037 U	0.036 U	0.042 U	0.036 U	0.039 U	0.0176 J	0.037 U	0.034 U	0.039 U	0.042 U	0.04 U	0.038 U	0.037 U	0.038 U	0.038 U	0.036 UJ	5.29 J	12 J
Indeno(1,2,3-cd)pyrene	NA	NA	1.1	21	0.04 U	0.037 U	0.042 U	0.038 U	0.035 U	0.037 U	0.036 U	0.042 U	0.036 U	0.039 U	0.037 U	0.037 U	0.034 U	0.039 U	0.042 U	0.04 U	0.038 U	0.0863	0.038 U	0.0591	0.036 UJ	0.41 U	0.41 U
Naphthalene	2.7	16	3.8	17	0.04 U	0.037 U	0.042 U	0.038 U	0.035 U	0.037 U	0.036 U	0.0588	0.036 U	0.039 U	0.0486	0.037 U	0.034 U	0.039 U	0.042 U	0.04 U	0.038 U	0.037 U	0.038 U	0.038 U	0.036 U	0.41 U	0.41 U
Phenanthrene	NA	NA	NA	NA	0.04 U	0.037 U	0.042 U	0.038 U	0.035 U	0.037 U	0.036 U	0.042 U	0.036 U	0.039 U	0.0487	0.037 U	0.034 U	0.039 U	0.042 U	0.04 U	0.038 U	0.0235 J	0.038 U	0.0204 J	0.036 UJ	4.21 J	8 J
Pyrene	NA	NA	1800	23000	0.04 U	0.037 U	0.042 U	0.038 U	0.035 U	0.037 U	0.036 U	0.042 U	0.036 U	0.0347 J	0.0199 J	0.037 U	0.034 U	0.039 U	0.042 U	0.014 J	0.038 U	0.0796	0.0643	0.0453	0.036 UJ	1.92	3.98
Benzo(a)Pyrene Equivalent (ND = 0 RL)	0.07	1.54	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0035	0.0015	ND	ND	ND	ND	ND	ND	**0.086**	0.027	0.033	ND	ND	0.013
Benzo(a)Pyrene Equivalent (ND = 1/2 RL)	0.07	1.54	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.045	0.042	ND	ND	ND	ND	ND	ND	**0.10**	0.048	0.052	ND	ND	**0.47**
Total Petroleum Hydrocarbons (mg/kg)																											
Total Petroleum Hydrocarbons (C10-C28) DRO	NA	NA	NA	NA	70.6	11 U	13 U	10 U	9.6 U	11 U	11 U	17.7	10 U	10 U	11 U	11 U	10 U	11 U	13 U	11 U	11 U	13.9	11 U	109	9.6 U	63400	39200
Total Petroleum Hydrocarbons (C6-C10) GRO	NA	NA	NA	NA	24 U	13 U	30 U	35 U	20 U	22 U	23 U	28 U	19 U	22 U	22 U	26 U	24 U	25 U	31 U	32 U	26 U	19 U	30 U	28 U	24 U	9310	5550
Inorganic Compounds (mg/kg)																											
Aluminum	72507	941748	77000	1.10E+06	13300 J+	5260 J+	13700 J+	4930 J+	10100 J+	5110 J+	8130 J+	15200 J+	5670 J+	14200 J+	5830 J+	9340	7270	12500	8620	11900	5450	9670 J+	12200 J+	10400 J+	18200 J+	14000	14600
Antimony	26	319	31	470	2.4 UJ	2.2 UJ	2.6 UJ	2.3 UJ	2.1 UJ	2.3 UJ	2.2 UJ	2.5 UJ	2.2 UJ	2.4 UJ	2.3 UJ	2.2 UJ	2 UJ	2.3 UJ	2.5 UJ	2.3 UJ	2.2 UJ	2.2 UJ	2.4 UJ	2.4 UJ	4.3 UJ	2.5 UJ	2.6 UJ
Arsenic	16	16	0.68	3	6.3	3.1	6	2.3 U	5.5	2.3 U	3.7	5.5	2.6	6.1	6.4	4.6	2.9	7.1	2.9	7	2.2 U	7.6	4.5	***60.3***	12.4	6.4	7.9
Barium	11247	127382	15000	220000	24 U	22 U	38.3	23 U	31.3	23 U	22 U	40.7	22 U	46.7	23 U	27.3	22.9	42	26.8	39	22 U	44.1	32.2	24 U	61.8	40	36.5
Beryllium	35	289	160	2300	0.36	0.22 U	0.41	0.23 U	0.24	0.23 U	0.22	0.5	0.22 U	0.41	0.23 U	0.27	0.22	0.33	0.27	0.33	0.22 U	0.22	0.27	0.24 U	0.24	0.25 U	0.26 U
Cadmium	6.9	87	71	980	0.61 U	0.55 U	0.64 U	0.57 U	0.53 U	0.56 U	0.56 U	0.61 U	0.56 U	0.59 U	0.57 U	0.55 U	0.5 U	0.59 U	0.64 U	0.57 U	0.55 U	0.68	0.6 U	0.6 U	0.54 U	0.62 U	0.65 U
Calcium	NA	NA	NA	NA	1030	744	1330	727	1420	1040	1160	1230	1100	6940	676	1710	1320	1430	2090	1470	1700	1110	1200	1070	3780	2470	2020
Chromium	NA	NA	NA	NA	20.4	10.6	21.8	9	17.4	9.3	14.3	24	14.3	25.4	14.1	15.5	12.9	19.1	16.2	26.5	10.2	18.8	17.8	28.9	45.1	43.4	37.2
Cobalt	22	291	23	350	8.8	5.5 U	8.8	5.7 U	8	6.4	6.6	9.1	5.6 U	9.7	6.1	7.1	5.6	9.4	6.4 U	9.1	5.5 U	7.9	7	8.6	17.5	12.2	12.5
Copper	10407	139231	3100	47000	17.3	8	17.8	4.8	19.5	5	12.9	20.2	5.9	22.4	6.3	12.3	9	19	11.6	17.5	6.7	28.9	16	35.4	57.4	41.8	35.6
Iron	51302	686351	55000	820000	20800	10400	19400	9320	21000	9000	14500	18800	10800	20100	13600	16000	12900	21000	12800	20500	7240	17700	16700	21400	37400	24700	28900
Lead	400	800	400	800	12.6	3.8	10.5	2.4	8.6	3.1	6.2	13.7	3	13.6	2.9	4.9	3.3	11.5	3.9	10.3	2.3	33.2	15.2	16.9	15.8	14.6	18.4
Magnesium	NA	NA	NA	NA	4960	2450	5080	2760	4230	2650	3690	5420	2950	5240	2980	3970	3360	4970	4110	5120	2570	4160	3440	4190	12500	9030	9370
Manganese	1118	11350	1800	26000	365	126	393	100	435	152	287	483	162	455	161	320	266	446	173	486	105	725	380	462	692	413	425
Mercury	3.1	3.1	11	46	0.038 U	0.036 U	0.041 U	0.032 U	0.032 U	0.035 U	0.034 U	0.04 U	0.038 U	0.038 U	0.034 U	0.035 U	0.032 U	0.038 U	0.036 U	0.032 U	0.034 U	0.036 U	0.037 U	0.036 U	0.033 U	0.034 U	0.038 U
Nickel	940	9707	1500	22000	22.2	10.9	22.4	11.6	20.6	11.3	16	25.4	13.1	25.5	14.1	17.2	14.2	22.8	14.8	22.3	10.4	21.8	16.9	25.2	41.5	29.9	28
Potassium	NA	NA	NA	NA	1200 U	1100 U	1300 U	1100 U	1100 U	1100 U	1100 U	1200 U	1100 U	1200 U	1100 U	1100 U	1000 U	1200 U	1300 U	1100 U	1100 U	1100 U	1200 U	1200 U	1530	1320	1460
Selenium	366	4900	390	5800	2.4 U	2.2 U	2.6 U	2.3 U	2.1 U	2.3 U	2.2 U	2.5 U	2.2 U	2.4 U	2.3 U	2.2 U	2 U	2.3 U	2.5 U	2.3 U	2.2 U	2.2 U	2.4 U	2.4 U	4.3 U	2.5 U	5.2 U
Silver	237	2483	390	5800	0.61 U	0.55 U	0.64 U	0.57 U	0.53 U	0.56 U	0.56 U	0.61 U	0.56 U	0.59 U	0.57 U	0.55 U	0.5 U	0.59 U	0.64 U	0.57 U	0.55 U	0.55 U	0.6 U	0.6 U	1.1 U	1.2 U	1.3 U
Sodium	NA	NA	NA	NA	1200 U	1100 U	1300 U	1100 U	1100 U	1100 U	1100 U	1200 U	1100 U	1200 U	1100 U	1100 U	1000 U	1200 U	1300 U	1100 U	1100 U	1100 U	1200 U	1200 U	1100 U	1200 U	1300 U
Thallium	0.73	196100	0.78	12	**1.2 U**	**1.1 U**	**1.3 U**	**1.1 U**	**1.1 U**	**1.1 U**	**1.1 U**	**1.2 U**	**1.1 U**	**1.2 U**	**1.1 U**	**1.1 U**	**1 U**	**1.2 U**	**1.3 U**	**1.1 U**	**1.1 U**	**1.1 U**	**1.2 U**	**1.2 U**	**2.2 U**	**1.2 U**	**2.6 U**
Vanadium	2.8	27	390	5800	**25.3**	**15.3**	**25.1**	**11.4**	**20.4**	**10.8**	**17.9**	***28.1***	**14.5**	***27.1***	**12.5**	**18.8**	**15.1**	**23.2**	**19.2**	**22.6**	**11.4**	**23.7**	**22.5**	**21.1**	***56.8***	***46.9***	***45.8***
Zinc	21986	294150	23000	350000	56.6	21.5	50.9	20	122	22.6	51.2	65.6	21.3	72	24.7	33.4	27.4	50.3	34.6	48	21.2	560	82.2	157	249	141	119
PCBs (mg/kg)																											
Aroclor-1016 (PCB-1016)	NA	NA	4.1	27	0.037 U	0.037 U	0.04 U	0.037 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.034 U	-	-
Aroclor-1221 (PCB-1221)	NA	NA	0.2	0.83	0.037 U	0.037 U	0.04 U	0.037 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.034 U	-	-
Aroclor-1232 (PCB-1232)	NA	NA	0.17	0.72	0.037 U	0.037 U	0.04 U	0.037 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.034 U	-	-
Aroclor-1242 (PCB-1242)	NA	NA	0.23	0.95	0.037 U	0.037 U	0.04 U	0.037 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.034 U	-	-
Aroclor-1248 (PCB-1248)	NA	NA	0.23	0.95	0.037 U	0.037 U	0.04 U	0.037 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.034 U	-	-
Aroclor-1254 (PCB-1254)	NA	NA	0.24	0.97	0.037 U	0.037 U	0.04 U	0.037 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.034 U	-	-
Aroclor-1260 (PCB-1260)	NA	NA	0.24	0.99	0.037 U	0.037 U	0.04 U	0.037 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.034 U	-	-
Aroclor-1262 (PCB-1262)	NA	NA	NA	NA	0.037 U	0.037 U	0.04 U	0.037 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.034 U	-	-
Aroclor-1268 (PCB-1268)	NA	NA	NA	NA	0.037 U	0.037 U	0.04 U	0.037 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.034 U	-	-
SUM of PCBs	NA	NA	0.23	0.94	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	ND	-	-
Other																											
Total Solids (%)	NA	NA	NA	NA	81.4	87.2	75.4	86.4	93	85.4	88.2	77.7	87.9	84.2 J	89.1 J	89.4	96.2	84.3	76.9	83.2	87.6	89.1	86.4	87.1	90	81.2	80.2

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*: Outside of QC limits
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mg/kg: milligram per kilogram
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RSL: Risk-Based Screening Levels
U: Not detected, value is the laboratory reporting limit
VT ANR: Vermont Agency of Natural Resources
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- Volatile and Semi-Volatile analytes detected in at least one sample are reported herein. For a complete list of analytes see the laboratory data sheets.
- Bold values indicate an exceedance of the Proposed 2019 VT ANR Residential Soil values and the USEPA May 2019 Residential Soil RSL where no VT ANR value is available.
- Italicized values indicate an exceedance of the Proposed 2019 VT ANR Non-Residential Soil values and the USEPA May 2019 Industrial Soil RSL where no VT ANR value is available.

TABLE 5.8-1
AOC 8 - TRANSFORMERS: SOIL ANALYTICAL RESULTS COMPARED TO RESIDENTIAL AND NON-RESIDENTIAL SOIL CRITERIA
VERMONT YANKEE
VERNON, VERMONT

Location Name Sample Name Sample Date Lab Sample ID Sample Depth (bgs)	VT ANR 2019 Proposed Residential Soil	VT ANR 2019 Proposed Non-Residential Soil	USEPA RSL Residential Soil HI = 1.0 May 2019	USEPA RSL Industrial Soil HI = 1.0 May 2019	SS0801 SS080100 05/09/2019 JC87860-11 0 - 1 (ft)	SS0801 SS080100DUP 05/09/2019 JC87860-12 0 - 1 (ft)	SS0802 SS080200 05/08/2019 JC87860-2 0 - 1 (ft)	SS0803 SS080300 05/08/2019 JC87860-1 0 - 1 (ft)	SS0804 SS080400 05/08/2019 JC87860-3 0 - 1 (ft)	SS0805 SS080500 05/09/2019 JC87860-6 0 - 1 (ft)	SS0806 SS080600 05/09/2019 JC87860-8 0 - 1 (ft)	SS0807 SS080700 05/09/2019 B3277_16682_DF_003 JC87860-10 0 - 1 (ft)	SS0808 SS080800 05/09/2019 B3277_16682_DF_002 JC87860-9 0 - 1 (ft)	SS0809 SS080900 05/09/2019 B3277_16682_DF_001 JC87860-7 0 - 1 (ft)	SS0810 SS081000 05/08/2019 JC87860-4 0 - 1 (ft)	SS0811 SS081100 05/08/2019 JC87860-5 0 - 1 (ft)
Dioxins/Furans (pg/g) *(Continued)*																
Total Heptachlorodibenzo-p-dioxin (HpCDD)	NA	NA	NA	NA	-	-	-	-	-	-	-	39	5.71	16.1	-	-
Total Hexachlorodibenzofuran (HxCDF)	NA	NA	NA	NA	-	-	-	-	-	-	-	2.93 J	1.21 J	2.98 J	-	-
Total Hexachlorodibenzo-p-dioxin (HxCDD), Mixture	NA	NA	100	470	-	-	-	-	-	-	-	3.53 J	1.64 J	4.12 J	-	-
Total Pentachlorodibenzofuran (PeCDF)	NA	NA	NA	NA	-	-	-	-	-	-	-	0.926 J	0.499 J	2.25 J	-	-
Total Pentachlorodibenzo-p-dioxin (PeCDD)	NA	NA	NA	NA	-	-	-	-	-	-	-	0.169	0.404	1.48 J	-	-
Total Tetrachlorodibenzofuran (TCDF)	NA	NA	NA	NA	-	-	-	-	-	-	-	0.236	0.179	0.933	-	-
Total Tetrachlorodibenzo-p-dioxin (TCDD)	NA	NA	NA	NA	-	-	-	-	-	-	-	0.163	0.179 J	0.409	-	-
PFAS (mg/kg)																
Fluorotelomer sulfonic acid (4:2 FTSA)	NA	NA	NA	NA	-	-	-	-	-	-	-	0.0011 U	0.0011 U	0.0012 U	-	-
Fluorotelomer sulfonic acid (6:2 FTSA)	NA	NA	NA	NA	-	-	-	-	-	-	-	0.0011 U	0.0011 U	0.0012 U	-	-
Fluorotelomer sulfonic acid (8:2 FTSA)	NA	NA	NA	NA	-	-	-	-	-	-	-	0.0011 U	0.0011 U	0.0012 U	-	-
N-ethyl perfluorooctane sulfonamidoacetic acid (N-EtFOSAA)	NA	NA	NA	NA	-	-	-	-	-	-	-	0.0028 U	0.0027 U	0.003 U	-	-
N-methyl perfluorooctane sulfonamidoacetic acid (N-MeFOSAA)	NA	NA	NA	NA	-	-	-	-	-	-	-	0.0028 U	0.0027 U	0.003 U	-	-
Perfluorobutanesulfonic Acid (PFBS)	NA	NA	1300	16000	-	-	-	-	-	-	-	0.0011 U	0.0011 U	0.0012 U	-	-
Perfluorobutanoic Acid (PFBA)	NA	NA	NA	NA	-	-	-	-	-	-	-	0.0011 U	0.000282 J	0.000335 J	-	-
Perfluorodecane sulfonic Acid (PFDS)	NA	NA	NA	NA	-	-	-	-	-	-	-	0.0011 U	0.0011 U	0.0012 U	-	-
Perfluorodecanoic acid (PFDA)	NA	NA	NA	NA	-	-	-	-	-	-	-	0.0011 U	0.0011 U	0.0012 U	-	-
Perfluorododecanoic acid (PFDoDA)	NA	NA	NA	NA	-	-	-	-	-	-	-	0.0011 U	0.0011 U	0.0012 U	-	-
Perfluoroheptane sulfonic acid (PFHpS)	NA	NA	NA	NA	-	-	-	-	-	-	-	0.0011 U	0.0011 U	0.0012 U	-	-
Perfluoroheptanoic acid (PFHpA)	1.22	14.36	NA	NA	-	-	-	-	-	-	-	0.0011 U	0.0011 U	0.0012 U	-	-
Perfluorohexanesulfonic acid (PFHxS)	1.22	14.36	NA	NA	-	-	-	-	-	-	-	0.0011 U	0.0011 U	0.0012 U	-	-
Perfluorohexanoic acid (PFHxA)	NA	NA	NA	NA	-	-	-	-	-	-	-	0.0011 U	0.0011 U	0.0012 U	-	-
Perfluorononane sulfonic acid (PFNS)	NA	NA	NA	NA	-	-	-	-	-	-	-	0.0011 U	0.0011 U	0.0012 U	-	-
Perfluorononanoic Acid (PFNA)	1.22	14.36	NA	NA	-	-	-	-	-	-	-	0.0011 U	0.0011 U	0.0012 U	-	-
Perfluorooctane sulfonamide (FOSA)	NA	NA	NA	NA	-	-	-	-	-	-	-	0.0011 U	0.0011 U	0.0012 U	-	-
Perfluorooctanesulfonic acid (PFOS)	1.22	14.36	NA	NA	-	-	-	-	-	-	-	0.0011 U	0.0011 U	0.0012 U	-	-
Perfluorooctanoic Acid (PFOA)	1.22	14.36	NA	NA	-	-	-	-	-	-	-	0.0011 U	0.0011 U	0.0012 U	-	-
Perfluoropentane sulfonic acid (PFPeS)	NA	NA	NA	NA	-	-	-	-	-	-	-	0.0011 U	0.0011 U	0.0012 U	-	-
Perfluoropentanoic Acid (PFPeA)	NA	NA	NA	NA	-	-	-	-	-	-	-	0.0011 U	0.0011 U	0.0012 U	-	-
Perfluorotetradecanoic acid (PFTeDA)	NA	NA	NA	NA	-	-	-	-	-	-	-	0.0011 U	0.0011 U	0.0012 U	-	-
Perfluorotridecanoic acid (PFTrDA)	NA	NA	NA	NA	-	-	-	-	-	-	-	0.0011 U	0.0011 U	0.0012 U	-	-
Perfluoroundecanoic acid (PFUnA)	NA	NA	NA	NA	-	-	-	-	-	-	-	0.0011 U	0.0011 U	0.000301 J	-	-

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U: Not detected, value is the laboratory reporting limit
VT ANR: Vermont Agency of Natural Resources
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- Volatile and Semi-Volatile analytes detected in at least one sample are reported herein. For a complete list of analytes see the laboratory data sheets.
- Bold values indicate an exceedance of the Proposed 2019 VT ANR Residential Soil values and the USEPA May 2019 Residential Soil RSL where no VT ANR value is available.
- Italicized values indicate an exceedance of the Proposed 2019 VT ANR Non-Residential Soil values and the USEPA May 2019 Industrial Soil RSL where no VT ANR value is available.

TABLE 5.8-1
AOC 8 - TRANSFORMERS: SOIL ANALYTICAL RESULTS COMPARED TO RESIDENTIAL AND NON-RESIDENTIAL SOIL CRITERIA
VERMONT YANKEE
VERNON, VERMONT

Location Name Sample Name Sample Date Lab Sample ID Sample Depth (bgs)	VT ANR 2019 Proposed Residential Soil	VT ANR 2019 Proposed Non-Residential Soil	USEPA RSL Residential Soil HI = 1.0 May 2019	USEPA RSL Industrial Soil HI = 1.0 May 2019	SS0801 SS080100 05/09/2019 JC87860-11 0 - 1 (ft)	SS0801 SS080100DUP 05/09/2019 JC87860-12 0 - 1 (ft)	SS0802 SS080200 05/08/2019 JC87860-2 0 - 1 (ft)	SS0803 SS080300 05/08/2019 JC87860-1 0 - 1 (ft)	SS0804 SS080400 05/08/2019 JC87860-3 0 - 1 (ft)	SS0805 SS080500 05/09/2019 JC87860-6 0 - 1 (ft)	SS0806 SS080600 05/09/2019 JC87860-8 0 - 1 (ft)	SS0807 SS080700 05/09/2019 B3277_16682_DF_003 JC87860-10 0 - 1 (ft)	SS0808 SS080800 05/09/2019 B3277_16682_DF_002 JC87860-9 0 - 1 (ft)	SS0809 SS080900 05/09/2019 B3277_16682_DF_001 JC87860-7 0 - 1 (ft)	SS0810 SS081000 05/08/2019 JC87860-4 0 - 1 (ft)	SS0811 SS081100 05/08/2019 JC87860-5 0 - 1 (ft)
Semi-Volatile Organic Compounds (mg/kg)																
Acenaphthene	NA	NA	3600	45000	0.04 U	0.04 U	0.042 U	0.038 U	0.043 U	0.034 U	0.039 U	0.037 U	0.035 U	0.039 U	0.04 U	0.039 U
Acenaphthylene	NA	NA	NA	NA	0.04 U	0.04 U	0.042 U	0.038 U	0.043 U	0.034 U	0.039 U	0.037 U	0.035 U	0.039 U	0.04 U	0.039 U
Anthracene	NA	NA	18000	230000	0.04 U	0.04 U	0.042 U	0.038 U	0.043 U	0.034 U	0.039 U	0.037 U	0.035 U	0.039 U	0.04 U	0.039 U
Benzo(a)anthracene	NA	NA	1.1	21	0.04 UJ	0.0115 J	0.042 U	0.0215 J	0.043 U	0.0384	0.039 U	0.037 U	0.035 U	0.039 U	0.0116 J	0.0122 J
Benzo(a)pyrene	0.07	1.54	0.11	2.1	0.04 U	0.04 U	0.042 U	0.0213 J	0.043 U	0.0515	0.039 U	0.037 U	0.035 U	0.039 U	0.04 U	0.039 U
Benzo(b)fluoranthene	NA	NA	1.1	21	0.04 U	0.04 U	0.042 U	0.0302 J	0.043 U	0.0799	0.039 U	0.037 U	0.035 U	0.039 U	0.04 U	0.039 U
Benzo(g,h,i)perylene	NA	NA	NA	NA	0.04 U	0.04 U	0.042 U	0.038 U	0.043 U	0.049	0.039 U	0.037 U	0.035 U	0.039 U	0.04 U	0.039 U
Benzo(k)fluoranthene	NA	NA	11	210	0.04 U	0.04 U	0.042 U	0.038 U	0.043 U	0.0284 J	0.039 U	0.037 U	0.035 U	0.039 U	0.04 U	0.039 U
Chrysene	NA	NA	110	2100	0.04 U	0.04 U	0.042 U	0.0198 J	0.043 U	0.0498	0.039 U	0.037 U	0.035 U	0.039 U	0.04 U	0.039 U
Dibenz(a,h)anthracene	NA	NA	0.11	2.1	0.04 U	0.04 U	0.042 U	0.038 U	0.043 U	0.034 U	0.039 U	0.037 U	0.035 U	0.039 U	0.04 U	0.039 U
Fluoranthene	2301	26371	2400	30000	0.04 U	0.0195 J	0.042 U	0.0427	0.043 U	0.109	0.039 U	0.037 U	0.035 U	0.039 U	0.0233 J	0.022 J
Fluorene	2301	26371	2400	30000	0.04 U	0.04 U	0.042 U	0.038 U	0.043 U	0.034 U	0.039 U	0.037 U	0.035 U	0.039 U	0.04 U	0.039 U
Indeno(1,2,3-cd)pyrene	NA	NA	1.1	21	0.04 U	0.04 U	0.042 U	0.038 U	0.043 U	0.0527	0.039 U	0.037 U	0.035 U	0.039 U	0.04 U	0.039 U
Naphthalene	2.7	16	3.8	17	0.04 U	0.04 U	0.042 U	0.038 U	0.043 U	0.034 U	0.039 U	0.037 U	0.035 U	0.039 U	0.04 U	0.039 U
Phenanthrene	NA	NA	NA	NA	0.04 U	0.04 U	0.042 U	0.017 J	0.043 U	0.0383	0.039 U	0.037 U	0.035 U	0.039 U	0.04 U	0.039 U
Pyrene	NA	NA	1800	23000	0.04 U	0.0149 J	0.042 U	0.0336 J	0.043 U	0.0788	0.039 U	0.037 U	0.035 U	0.039 U	0.0178 J	0.0158 J
Benzo(a)Pyrene Equivalent (ND = 0 RL)	0.07	1.54	NA	NA	ND	0.0012	ND	0.026	ND	0.069	ND	ND	ND	ND	0.0012	0.0012
Benzo(a)Pyrene Equivalent (ND = 1/2 RL)	0.07	1.54	NA	NA	ND	0.045	ND	0.048	ND	**0.086**	ND	ND	ND	ND	0.045	0.044
Total Petroleum Hydrocarbons (mg/kg)																
Total Petroleum Hydrocarbons (C10-C28) DRO	NA	NA	NA	NA	-	-	-	-	-	22.4	11 U	-	-	-	-	-
Total Petroleum Hydrocarbons (C6-C10) GRO	NA	NA	NA	NA	-	-	-	-	-	21 U	27 U	-	-	-	-	-
PCBs (mg/kg)																
Aroclor-1016 (PCB-1016)	NA	NA	4.1	27	0.04 U	0.04 U	0.041 U	0.038 U	0.043 U	0.034 U	0.037 U	0.036 U	0.035 U	0.036 U	0.039 U	0.04 U
Aroclor-1221 (PCB-1221)	NA	NA	0.2	0.83	0.04 U	0.04 U	0.041 U	0.038 U	0.043 U	0.034 U	0.037 U	0.036 U	0.035 U	0.036 U	0.039 U	0.04 U
Aroclor-1232 (PCB-1232)	NA	NA	0.17	0.72	0.04 U	0.04 U	0.041 U	0.038 U	0.043 U	0.034 U	0.037 U	0.036 U	0.035 U	0.036 U	0.039 U	0.04 U
Aroclor-1242 (PCB-1242)	NA	NA	0.23	0.95	0.04 U	0.04 U	0.041 U	0.038 U	0.043 U	0.034 U	0.037 U	0.036 U	0.035 U	0.036 U	0.039 U	0.04 U
Aroclor-1248 (PCB-1248)	NA	NA	0.23	0.95	0.04 U	0.04 U	0.041 U	0.038 U	0.043 U	0.034 U	0.037 U	0.036 U	0.035 U	0.036 U	0.039 U	0.04 U
Aroclor-1254 (PCB-1254)	NA	NA	0.24	0.97	0.04 U	0.04 U	0.041 U	0.038 U	0.043 U	0.034 U	0.037 U	0.036 U	0.035 U	0.036 U	0.039 U	0.04 U
Aroclor-1260 (PCB-1260)	NA	NA	0.24	0.99	0.04 U	0.04 U	0.041 U	0.038 U	0.043 U	0.034 U	0.037 U	0.036 U	0.035 U	0.036 U	0.039 U	0.04 U
Aroclor-1262 (PCB-1262)	NA	NA	NA	NA	0.04 U	0.04 U	0.041 U	0.038 U	0.043 U	0.034 U	0.037 U	0.036 U	0.035 U	0.036 U	0.039 U	0.04 U
Aroclor-1268 (PCB-1268)	NA	NA	NA	NA	0.04 U	0.04 U	0.041 U	0.038 U	0.043 U	0.034 U	0.037 U	0.036 U	0.035 U	0.036 U	0.039 U	0.04 U
SUM of PCBs	NA	NA	0.23	0.94	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Other																
Total Solids (%)	NA	NA	NA	NA	81.1	81.1	78	83.5	76.1	96.5	84.4	88.8	92.1	82.6	82.3	83.4
Dioxins/Furans (pg/g)																
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	NA	NA	NA	NA	-	-	-	-	-	-	-	7.76	1.93 J	5.83	-	-
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	NA	NA	NA	NA	-	-	-	-	-	-	-	320	35.5	66	-	-
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	NA	NA	NA	NA	-	-	-	-	-	-	-	2.59	0.861 J	2.34	-	-
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	NA	NA	NA	NA	-	-	-	-	-	-	-	20.8	3.42	9.25	-	-
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	NA	NA	NA	NA	-	-	-	-	-	-	-	0.133 U	0.0856 U	0.229 J	-	-
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	NA	NA	NA	NA	-	-	-	-	-	-	-	0.192 J	0.115 J	0.317 J	-	-
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	NA	NA	NA	NA	-	-	-	-	-	-	-	0.146 J	0.0685 J	0.0699 U	-	-
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	NA	NA	NA	NA	-	-	-	-	-	-	-	0.0736 U	0.0866 J	0.216 J	-	-
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	NA	NA	NA	NA	-	-	-	-	-	-	-	0.597 J	0.135 J	0.363 J	-	-
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	NA	NA	NA	NA	-	-	-	-	-	-	-	0.0883 U	0.0721 U	0.0803 U	-	-
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	NA	NA	NA	NA	-	-	-	-	-	-	-	0.313 J	0.141 J	0.326 J	-	-
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	NA	NA	NA	NA	-	-	-	-	-	-	-	0.0513 U	0.0764 U	0.105 J	-	-
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	NA	NA	NA	NA	-	-	-	-	-	-	-	0.133 U	0.159 U	0.147 U	-	-
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	NA	NA	NA	NA	-	-	-	-	-	-	-	0.178 J	0.0846 J	0.262 J	-	-
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	NA	NA	NA	NA	-	-	-	-	-	-	-	0.0532 U	0.0786 U	0.164 J	-	-
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	NA	NA	NA	NA	-	-	-	-	-	-	-	0.0664 U	0.0672 U	0.147 J	-	-
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	2.25	13.7	4.8	22	-	-	-	-	-	-	-	0.077 U	0.127 U	0.0926 U	-	-
Total Heptachlorodibenzofuran (HpCDF)	NA	NA	NA	NA	-	-	-	-	-	-	-	7.97	1.94	5.03 J	-	-

TABLE 5.8-2
AOC 8 - TRANSFORMERS: GROUNDWATER ANALYTICAL RESULTS COMPARED TO GROUNDWATER ENFORCEMENT STANDARDS
VERMONT YANKEE
VERNON, VERMONT

Location Name Sample Name Sample Date Lab Sample ID	VT ANR Proposed 2019 Groundwater Enforcement Standard	DP0807 GW0807-20190503 05/03/2019 B3259_16698_DF_002 JC87576-2	DP0808 GW0808-20190503 05/03/2019 B3259_16671_DF_001 JC87576-1
Dioxins/Furans (ug/L)			
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	NA	0.0000996 U	0.00000132 U
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	NA	0.0000996 U	0.0000273 J
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	NA	0.0000498 U	0.000000669 U
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	NA	0.00000448 U	0.00000113 J
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	NA	0.0000136 U	0.0000007 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	NA	0.0000498 U	0.000000631 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	NA	0.00000423 U	0.00000068 U
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	NA	0.0000106 U	0.000000634 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	NA	0.00000427 U	0.000000685 U
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	NA	0.0000114 U	0.000000763 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	NA	0.00000402 U	0.000000939 J
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	NA	0.00000578 U	0.000000653 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	NA	0.00000617 U	0.000000995 U
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	NA	0.0000114 U	0.000000654 U
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	NA	0.00000558 U	0.000000669 U
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	NA	0.00000439 U	0.000000851 U
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	3.00E-05	0.00000522 U	0.00000123 U
Total Heptachlorodibenzofuran (HpCDF)	NA	0.0000498 U	0.000000684 U
Total Heptachlorodibenzo-p-dioxin (HpCDD)	NA	0.00000448 U	0.0000023 J
Total Hexachlorodibenzofuran (HxCDF)	NA	0.0000172 J	0.000000666 U
Total Hexachlorodibenzo-p-dioxin (HxCDD), Mixture	NA	0.00000416 U	0.000000939
Total Pentachlorodibenzofuran (PeCDF)	NA	0.00000568 U	0.000000661 U
Total Pentachlorodibenzo-p-dioxin (PeCDD)	NA	0.00000617 U	0.000000995 U
Total Tetrachlorodibenzofuran (TCDF)	NA	0.00000439 U	0.000000851 U
Total Tetrachlorodibenzo-p-dioxin (TCDD)	NA	0.00000522 U	0.00000123 U
PFAS (ug/L)			
Fluorotelomer sulfonic acid (4:2 FTSA)	NA	0.008 U	0.008 U
Fluorotelomer sulfonic acid (6:2 FTSA)	NA	0.008 U	0.008 U
Fluorotelomer sulfonic acid (8:2 FTSA)	NA	0.008 U	0.008 U
N-ethyl perfluorooctane sulfonamidoacetic acid (N-EtFOSAA)	NA	0.02 U	0.02 U
N-methyl perfluorooctane sulfonamidoacetic acid (N-MeFOSAA)	NA	0.02 U	0.02 U
Perfluorobutanesulfonic Acid (PFBS)	NA	0.0157	0.0134
Perfluorobutanoic Acid (PFBA)	NA	0.0863	0.00766 J
Perfluorodecane sulfonic Acid (PFDS)	NA	0.004 U	0.004 U
Perfluorodecanoic acid (PFDA)	NA	0.004 U	0.004 U
Perfluorododecanoic acid (PFDoDA)	NA	0.004 U	0.004 U
Perfluoroheptane sulfonic acid (PFHpS)	NA	0.004 U	0.004 U
Perfluoroheptanoic acid (PFHpA)	0.02	**0.141**	0.00825
Perfluorohexanesulfonic acid (PFHxS)	0.02	0.00113 J	0.004 U
Perfluorohexanoic acid (PFHxA)	NA	0.157	0.00488
Perfluorononane sulfonic acid (PFNS)	NA	0.004 U	0.004 U
Perfluorononanoic Acid (PFNA)	0.02	0.004 U	0.004 U
Perfluorooctane sulfonamide (FOSA)	NA	0.004 U	0.004 U
Perfluorooctanesulfonic acid (PFOS)	0.02	0.004 U	0.00184 J
Perfluorooctanoic Acid (PFOA)	0.02	0.00565	0.00905
Perfluoropentane sulfonic acid (PFPeS)	NA	0.004 U	0.004 U
Perfluoropentanoic Acid (PFPeA)	NA	0.118	0.00478
Perfluorotetradecanoic acid (PFTeDA)	NA	0.004 U	0.004 U
Perfluorotridecanoic acid (PFTrDA)	NA	0.004 U	0.004 U
Perfluoroundecanoic acid (PFUnA)	NA	0.004 U	0.004 U
SUM of PFAS (ND = 0)	0.02	**0.14778**	0.01914
SUM of PFAS (ND = 1/2 RL)	0.02	**0.15178**	**0.02314**

ABBREVIATIONS AND NOTES:
-: Not Analyzed
J: valued is estimated
J+: valued is estimated with a potential high bias
mS/cm: milliSiemen per centimeter
mv: millivolt
NA: Not Applicable
NTU: Nephelometric Turbidiy Units
RSL: Risk-Based Screening Levels
U: Not detected, value is the laboratory reporting limit
ug/L: microgram per liter
USEPA: United States Environmental Protection Agency
VT ANR: Vermont Agency of Natural Resources
- Volatile and Semi-Volatile analytes detected in at least one sample are reported herein. For a complete list of analytes see the laboratory data sheets.
- Bold values indicate an exceedance of the VT ANR Proposed 2019 Groundwater Enforcement Standard.

TABLE 5.10-1
AOC 10 - PARKING LOTS: SOIL ANALYTICAL RESULTS COMPARED TO RESIDENTIAL AND NON-RESIDENTIAL SOIL CRITERIA
VERMONT YANKEE
VERNON, VERMONT

Location Name Sample Name Sample Date Lab Sample ID Sample Depth (bgs)	VT ANR 2019 Proposed Residential Soil	VT ANR 2019 Proposed Non-Residential Soil	USEPA RSL Residential Soil HI = 1.0 May 2019	USEPA RSL Industrial Soil HI = 1.0 May 2019	DP1011 DP101100 04/29/2019 JC87266-12 0 - 1 (ft)	DP1011 DP101101 04/29/2019 JC87266-13 1 - 2 (ft)	DP1012 DP101200 04/29/2019 JC87266-15 0 - 1 (ft)	DP1012 DP101201 04/29/2019 JC87266-14 1 - 2 (ft)	DP1013 DP101300 04/29/2019 JC87184-7 0 - 1 (ft)	DP1013 DP101301 04/29/2019 JC87184-8 1 - 2 (ft)
Other										
Total Solids (%)	NA	NA	NA	NA	95.4	89.5	85.1	86.9	83.8	83.5
Herbicides (mg/kg)										
2,4,5-T	NA	NA	630	8200	0.0034 U	0.0035 U	0.0038 U	0.0035 U	0.0037 U	0.0036 U
2,4,5-TP (Silvex)	NA	NA	510	6600	0.0034 U	0.0035 U	0.0038 U	0.0035 U	0.0037 U	0.0036 U
2,4-Dichlorophenoxyacetic acid (2,4-D)	NA	NA	700	9600	0.017 UJ	0.018 UJ	0.019 UJ	0.018 UJ	0.018 U	0.018 U
Dalapon	NA	NA	1900	25000	0.0034 U	0.0035 U	0.0038 U	0.0035 U	0.0037 U	0.0036 U
Dichloroprop	NA	NA	NA	NA	0.017 U	0.018 U	0.019 U	0.018 U	0.018 U	0.018 U
Dinoseb	NA	NA	63	820	0.017 UJ	0.018 UJ	0.019 UJ	0.018 UJ	0.018 U	0.018 U
Pesticides (mg/kg)										
4,4'-DDD	NA	NA	1.9	9.6	0.00065 U	0.00071 U	0.00078 U	0.00072 U	0.00077 U	0.00077 U
4,4'-DDE	NA	NA	2	9.3	0.00065 U	0.00071 U	0.00078 U	0.00072 U	0.0022	0.00076 J
4,4'-DDT	NA	NA	1.9	8.5	0.00065 U	0.00071 U	0.00078 U	0.00072 U	0.00071 J	0.00073 J
Aldrin	0.02	0.1	0.039	0.18	0.00065 U	0.00071 U	0.00078 U	0.00072 U	0.00077 U	0.00077 U
alpha-BHC	NA	NA	0.086	0.36	0.00065 U	0.00071 U	0.00078 U	0.00072 U	0.00077 U	0.00077 U
alpha-Chlordane	NA	NA	NA	NA	0.00065 U	0.00071 U	0.00078 U	0.00072 U	0.00077 U	0.00077 U
beta-BHC	NA	NA	0.3	1.3	0.00065 U	0.00071 U	0.00078 U	0.00072 U	0.00077 U	0.00077 U
delta-BHC	NA	NA	NA	NA	0.00065 U	0.00071 U	0.00078 U	0.00072 U	0.00077 U	0.00077 U
Dieldrin	NA	NA	0.034	0.14	0.00065 U	0.00071 U	0.00078 U	0.00072 U	0.00077 U	0.00077 U
Endosulfan I	NA	NA	NA	NA	0.00065 U	0.00071 U	0.00078 U	0.00072 U	0.00077 U	0.00077 U
Endosulfan II	NA	NA	NA	NA	0.00065 U	0.00071 U	0.00078 U	0.00072 U	0.00077 U	0.00077 U
Endosulfan sulfate	NA	NA	380	4900	0.00065 U	0.00071 U	0.00078 U	0.00072 U	0.00077 U	0.00077 U
Endrin	NA	NA	19	250	0.00065 U	0.00071 U	0.00078 U	0.00072 U	0.00077 U	0.00077 U
Endrin aldehyde	NA	NA	NA	NA	0.00065 U	0.00071 U	0.00078 U	0.00072 U	0.00077 U	0.00077 U
Endrin ketone	NA	NA	NA	NA	0.00065 U	0.00071 U	0.00078 U	0.00072 U	0.00077 U	0.00077 U
gamma-BHC (Lindane)	NA	NA	0.57	2.5	0.00065 U	0.00071 U	0.00078 U	0.00072 U	0.00077 U	0.00077 U
gamma-Chlordane	NA	NA	NA	NA	0.00065 U	0.00071 U	0.00078 U	0.00072 U	0.00077 U	0.00077 U
Heptachlor	NA	NA	0.13	0.63	0.00065 U	0.00071 U	0.00078 U	0.00072 U	0.00077 U	0.00077 U
Heptachlor epoxide	NA	NA	0.07	0.33	0.00065 U	0.00071 U	0.00078 U	0.00072 U	0.00077 U	0.00077 U
Methoxychlor	NA	NA	320	4100	0.0013 U	0.0014 U	0.0016 U	0.0014 U	0.0015 U	0.0015 U
Toxaphene	NA	NA	0.49	2.1	0.016 U	0.018 U	0.02 U	0.018 U	0.019 U	0.019 U

ABBREVIATIONS AND NOTES:
-: Not Analyzed
*: Outside of QC limits
J: value is estimated
mg/kg: milligram per kilogram
NA: Not Applicable
RSL: Risk-Based Screening Levels
U: Not detected, value is the laboratory reporting limit
VT ANR: Vermont Agency of Natural Resources
USEPA: United State Environmental Protection Agency

- Volatile and Semi-Volatile analytes detected in at least one sample are reported herein. For a complete list of analytes see the laboratory data sheets.
- Bold values indicate an exceedance of the Proposed 2019 VT ANR Residential Soil values and the USEPA May 2019 Residential Soil RSL where no VT ANR value is available.
- Italicized values indicate an exceedance of the Proposed 2019 VT ANR Non-Residential Soil values and the USEPA May 2019 Industrial Soil RSL where no VT ANR value is available.

TABLE 5.10-2
AOC 10 - PARKING LOTS: GROUNDWATER ANALYTICAL RESULTS COMPARED TO GROUNDWATER ENFORCEMENT STANDARDS
VERMONT YANKEE
VERNON, VERMONT

Location Name Sample Name Sample Date Lab Sample ID	VT ANR Proposed 2019 Groundwater Enforcement Standard	DP1011 GW1011-20190429 04/29/2019 JC87443-4	DP1012 GW1012-20190429 04/29/2019 JC87443-3	DP1013 GW1013-20190429 04/29/2019 JC87443-1
Herbicides (ug/L)				
2,4,5-T	70	0.083 U	0.083 U	0.083 U
2,4,5-TP (Silvex)	50	0.083 U	0.083 U	0.083 U
2,4-Dichlorophenoxyacetic acid (2,4-D)	70	0.42 U	0.42 U	0.42 U
Dalapon	200	0.083 U	0.083 U	0.083 U
Dichloroprop	140	0.42 U	0.42 U	0.42 U
Dinoseb	7	0.42 U	0.42 U	0.42 U
Pesticides (ug/L)				
4,4'-DDD	NA	0.0067 U	0.0067 U	0.0067 U
4,4'-DDE	NA	0.0067 U	0.0067 U	0.0067 U
4,4'-DDT	NA	0.0067 U	0.0067 U	0.0067 U
Aldrin	0.1	0.0067 U	0.0067 U	0.0067 U
alpha-BHC	NA	0.0067 U	0.0067 U	0.0067 U
alpha-Chlordane	NA	0.0067 U	0.0067 U	0.0067 U
beta-BHC	NA	0.0055 J	0.0082 J	0.011 J
delta-BHC	NA	0.0067 U	0.0067 U	0.0067 U
Dieldrin	0.02	0.0067 U	0.0067 U	0.0067 U
Endosulfan I	NA	0.0067 U	0.0067 U	0.0067 U
Endosulfan II	NA	0.0067 U	0.0067 U	0.0067 U
Endosulfan sulfate	NA	0.0067 U	0.0067 U	0.0067 U
Endrin	2	0.0067 U	0.0067 U	0.0067 U
Endrin aldehyde	NA	0.0067 UJ	0.0067 UJ	0.0067 UJ
Endrin ketone	NA	0.0067 U	0.0067 U	0.0067 U
gamma-BHC (Lindane)	0.2	0.0067 U	0.0067 U	0.0067 U
gamma-Chlordane	NA	0.0067 U	0.0067 U	0.0067 U
Heptachlor	0.4	0.0067 U	0.0067 U	0.0067 U
Heptachlor epoxide	0.2	0.0067 U	0.0067 U	0.0067 U
Methoxychlor	40	0.013 U	0.013 U	0.013 U
Toxaphene	3	0.17 U	0.17 U	0.17 U

ABBREVIATIONS AND NOTES:
-: Not Analyzed
J: valued is estimated
J+: valued is estimated with a potential high bias
mS/cm: milliSiemen per centimeter
mv: millivolt
NA: Not Applicable
NTU: Nephelometric Turbidiy Units
RSL: Risk-Based Screening Levels
U: Not detected, value is the laboratory reporting limit
ug/L: microgram per liter
USEPA: United States Environmental
VT ANR: Vermont Agency of Natural

- Volatile and Semi-Volatile analytes detected in at least one sample are reported herein.
  For a complete list of analytes see the laboratory data sheets.
- Bold values indicate an exceedance of the VT ANR Proposed 2019 Groundwater Enforcement Standard.

TABLE 5.11-1
AOC 11 - HAZARDOUS MATERIALS STORAGE: SOIL ANALYTICAL RESULTS COMPARED TO RESIDENTIAL AND NON-RESIDENTIAL SOIL CRITERIA
VERMONT YANKEE
VERNON, VERMONT

Location Name Sample Name Sample Date Lab Sample ID Sample Depth (bgs)	VT ANR 2019 Proposed Residential Soil	VT ANR 2019 Proposed Non-Residential Soil	USEPA RSL Residential Soil HI = 1.0 May 2019	USEPA RSL Industrial Soil HI = 1.0 May 2019	DP1101 DP110101 05/02/2019 JC87450-11 0 - 1 (ft)	DP1101 DP110107 05/02/2019 JC87450-12 5 - 7 (ft)	DP1102 DP110201 04/25/2019 JC86994-21 0 - 1 (ft)	DP1102 DP110229 04/25/2019 JC86994-22 29 - 30 (ft)	DP1103 DP110301 04/30/2019 JC87266-3 0 - 1 (ft)	DP1103 DP110318 04/30/2019 JC87266-4 18 - 20 (ft)
Volatile Organic Compounds (mg/kg)										
1,1,1,2-Tetrachloroethane	1.3	8	2	8.8	0.0021 U	0.0022 U	0.0019 U	0.0023 U	0.002 U	0.002 U
1,1,1-Trichloroethane	NA	NA	8100	36000	0.0021 U	0.0022 U	0.0019 U	0.0023 U	0.002 U	0.002 U
1,1,2,2-Tetrachloroethane	NA	NA	0.6	2.7	0.0021 U	0.0022 U	0.0019 U	0.0023 U	0.002 U	0.002 U
1,1,2-Trichloroethane	NA	NA	1.1	5	0.0021 U	0.0022 U	0.0019 U	0.0023 U	0.002 U	0.002 U
1,1-Dichloroethane	2.1	13	3.6	16	0.0011 U	0.0011 U	0.00096 U	0.0011 U	0.00099 U	0.00098 U
1,1-Dichloroethene	NA	NA	230	1000	0.0011 U	0.0011 U	0.00096 U	0.0011 U	0.00099 U	0.00098 U
1,1-Dichloropropene	NA	NA	NA	NA	0.0021 U	0.0022 U	0.0019 U	0.0023 U	0.002 U	0.002 U
1,2,3-Trichlorobenzene	NA	NA	63	930	0.0054 U	0.0056 U	0.0048 U	0.0056 U	0.0049 U	0.0049 U
1,2,3-Trichloropropane	0.00311	0.07	0.0051	0.11	**0.0054 U**	**0.0056 U**	**0.0048 U**	**0.0056 U**	**0.0049 U**	**0.0049 U**
1,2,4-Trichlorobenzene	NA	NA	24	110	0.0054 U	0.0056 U	0.0048 U	0.0056 U	0.0049 U	0.0049 U
1,2,4-Trimethylbenzene	144	177	300	1800	0.0021 U	0.0022 U	0.0019 U	0.0023 U	0.002 U	0.002 U
1,2-Dibromo-3-chloropropane (DBCP)	0.01	0.06	0.0053	0.064	0.0021 U	0.0022 U	0.0019 U	0.0023 U	0.002 U	0.002 U
1,2-Dibromoethane (Ethylene Dibromide)	0.02	0.14	0.036	0.16	0.0011 U	0.0011 U	0.00096 U	0.0011 U	0.00099 U	0.00098 U
1,2-Dichlorobenzene	NA	NA	1800	9300	0.0011 U	0.0011 U	0.00096 U	0.0011 U	0.00099 U	0.00098 U
1,2-Dichloroethane	0.29	1.7	0.46	2	0.0011 U	0.0011 U	0.00096 U	0.0011 U	0.00099 U	0.00098 U
1,2-Dichloropropane	1.5	9.1	2.5	11	0.0021 U	0.0022 U	0.0019 U	0.0023 U	0.002 U	0.002 U
1,3,5-Trimethylbenzene	144	177	270	1500	0.0021 U	0.0022 U	0.0019 U	0.0023 U	0.002 U	0.002 U
1,3-Dichlorobenzene	NA	NA	NA	NA	0.0011 U	0.0011 U	0.00096 U	0.0011 U	0.00099 U	0.00098 U
1,3-Dichloropropane	NA	NA	1600	23000	0.0021 U	0.0022 U	0.0019 U	0.0023 U	0.002 U	0.002 U
1,4-Dichlorobenzene	NA	NA	2.6	11	0.0011 U	0.0011 U	0.00096 U	0.0011 U	0.00099 U	0.00098 U
2,2-Dichloropropane	NA	NA	NA	NA	0.0021 U	0.0022 U	0.0019 U	0.0023 U	0.002 U	0.002 U
2-Butanone (Methyl Ethyl Ketone)	16952	26991	27000	190000	0.011 U	0.0154	0.0096 U	0.011 U	0.0099 U	0.0098 U
2-Chlorotoluene	NA	NA	1600	23000	0.0021 U	0.0022 U	0.0019 U	0.0023 U	0.002 U	0.002 U
2-Phenylbutane (sec-Butylbenzene)	7009	102200	7800	120000	0.0021 U	0.0022 U	0.0019 U	0.0023 U	0.002 U	0.002 U
4-Chlorotoluene	NA	NA	1600	23000	0.0021 U	0.0022 U	0.0019 U	0.0023 U	0.002 U	0.002 U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	NA	NA	33000	140000	0.0054 U	0.0056 U	0.0048 U	0.0056 U	0.0049 U	0.0049 U
Acetone	40609	100028	61000	670000	0.011 U	0.0794	0.0096 UJ	0.0363 J	0.0099 U	0.0189 U
Benzene	0.7	4.2	1.2	5.1	0.00054 U	0.00056 U	0.00048 U	0.00056 U	0.00049 U	0.00049 U
Bromobenzene	NA	NA	290	1800	0.0054 U	0.0056 U	0.0048 U	0.0056 U	0.0049 U	0.0049 U
Bromodichloromethane	NA	NA	0.29	1.3	0.0021 U	0.0022 U	0.0019 U	0.0023 U	0.002 U	0.002 U
Bromoform	NA	NA	19	86	0.0054 U	0.0056 U	0.0048 U	0.0056 U	0.0049 U	0.0049 U
Bromomethane (Methyl Bromide)	NA	NA	6.8	30	0.0054 U	0.0056 U	0.0048 U	0.0056 U	0.0049 U	0.0049 U
Carbon tetrachloride	0.37	2.2	0.65	2.9	0.0021 U	0.0022 U	0.0019 U	0.0023 U	0.002 U	0.002 U
Chlorobenzene	414	726	280	1300	0.0021 U	0.0022 U	0.0019 U	0.0023 U	0.002 U	0.002 U
Chlorobromomethane	193	597	150	630	0.0054 U	0.0056 U	0.0048 U	0.0056 U	0.0049 U	0.0049 U
Chloroethane	NA	NA	14000	57000	0.0054 U	0.0056 U	0.0048 U	0.0056 U	0.0049 U	0.0049 U
Chloroform (Trichloromethane)	NA	NA	0.32	1.4	0.0021 U	0.0022 U	0.0019 U	0.0023 U	0.002 U	0.002 U
Chloromethane (Methyl Chloride)	NA	NA	110	460	0.0054 U	0.0056 U	0.0048 U	0.0056 U	0.0049 U	0.0049 U
cis-1,2-Dichloroethene	140	1814	160	2300	0.0011 U	0.0011 U	0.00096 U	0.0011 U	0.00099 U	0.00098 U
cis-1,3-Dichloropropene	NA	NA	NA	NA	0.0021 U	0.0022 U	0.0019 U	0.0023 U	0.002 U	0.002 U
Cymene (p-Isopropyltoluene)	NA	NA	NA	NA	0.0021 U	0.0022 U	0.0019 U	0.0023 U	0.002 U	0.002 U
Dibromochloromethane	NA	NA	8.3	39	0.0021 U	0.0022 U	0.0019 U	0.0023 U	0.002 U	0.002 U
Dibromomethane	NA	NA	24	99	0.0054 U	0.0056 U	0.0048 U	0.0056 U	0.0049 U	0.0049 U
Dichlorodifluoromethane (CFC-12)	NA	NA	87	370	0.0054 U	0.0056 U	0.0048 U	0.0056 U	0.0049 U	0.0049 U
Ethylbenzene	3.7	22	5.8	25	0.0011 U	0.0011 U	0.00096 U	0.0011 U	0.00099 U	0.00098 U
Hexachlorobutadiene	NA	NA	1.2	5.3	0.0054 U	0.0056 U	0.0048 U	0.0056 U	0.0049 U	0.0049 U
Isopropylbenzene (Cumene)	256	264	1900	9900	0.0021 U	0.0022 U	0.0019 U	0.0023 U	0.002 U	0.002 U
m,p-Xylenes	NA	NA	NA	NA	0.0011 U	0.0011 U	0.00096 U	0.0011 U	0.00099 U	0.00098 U
Methyl Tert Butyl Ether	649	4464	47	210	0.0011 U	0.0011 U	0.00096 U	0.0011 U	0.00099 U	0.00098 U
Methylene chloride	NA	NA	57	1000	0.0054 U	0.0056 U	0.0048 U	0.0056 U	0.0049 U	0.0049 U
Naphthalene	2.7	16	3.8	17	0.0054 U	0.0056 U	0.0048 U	0.0056 U	0.0049 U	0.0049 U
n-Butylbenzene	3504	51100	3900	58000	0.0021 U	0.0022 U	0.0019 U	0.0023 U	0.002 U	0.002 U
n-Propylbenzene	253	261	3800	24000	0.0021 U	0.0022 U	0.0019 U	0.0023 U	0.002 U	0.002 U
o-Xylene	NA	NA	650	2800	0.0011 U	0.0011 U	0.00096 U	0.0011 U	0.00099 U	0.00098 U
Styrene	NA	NA	6000	35000	0.0021 U	0.0022 U	0.0019 U	0.0023 U	0.002 U	0.002 U
tert-Butylbenzene	7009	102200	7800	120000	0.0021 U	0.0022 U	0.0019 U	0.0023 U	0.002 U	0.002 U
Tetrachloroethene	2.4	14	24	100	0.0021 U	0.0022 U	0.0019 U	0.0023 U	0.002 U	0.002 U
Toluene	706	798	4900	47000	0.0011 U	0.0011 U	0.00096 U	0.0011 U	0.00099 U	0.00098 U
trans-1,2-Dichloroethene	1402	18137	1600	23000	0.0011 U	0.0011 U	0.00096 U	0.0011 U	0.00099 U	0.00098 U
trans-1,3-Dichloropropene	NA	NA	NA	NA	0.0021 U	0.0022 U	0.0019 U	0.0023 U	0.002 U	0.002 U
Trichloroethene	0.68	6.5	0.94	6	0.0011 U	0.0011 U	0.00096 U	0.0011 U	0.00099 U	0.00098 U
Trichlorofluoromethane (CFC-11)	NA	NA	23000	350000	0.0054 U	0.0056 U	0.0048 U	0.0056 U	0.0049 U	0.0049 U
Vinyl chloride	0.1	0.59	0.059	1.7	0.0021 U	0.0022 U	0.0019 U	0.0023 U	0.002 U	0.002 U
Xylene (total)	252	257	580	2500	0.0011 U	0.0011 U	0.00096 U	0.0011 U	0.00099 U	0.00098 U

TABLE 5.11-1
AOC 11 - HAZARDOUS MATERIALS STORAGE: SOIL ANALYTICAL RESULTS COMPARED TO RESIDENTIAL AND NON-RESIDENTIAL SOIL CRITERIA
VERMONT YANKEE
VERNON, VERMONT

Location Name Sample Name Sample Date Lab Sample ID Sample Depth (bgs)	VT ANR 2019 Proposed Residential Soil	VT ANR 2019 Proposed Non-Residential Soil	USEPA RSL Residential Soil HI = 1.0 May 2019	USEPA RSL Industrial Soil HI = 1.0 May 2019	DP1101 DP110101 05/02/2019 JC87450-11 0 - 1 (ft)	DP1101 DP110107 05/02/2019 JC87450-12 5 - 7 (ft)	DP1102 DP110201 04/25/2019 JC86994-21 0 - 1 (ft)	DP1102 DP110229 04/25/2019 JC86994-22 29 - 30 (ft)	DP1103 DP110301 04/30/2019 JC87266-3 0 - 1 (ft)	DP1103 DP110318 04/30/2019 JC87266-4 18 - 20 (ft)
Semi-Volatile Organic Compounds (mg/kg)										
1,2,4-Trichlorobenzene	NA	NA	24	110	0.075 U	0.073 U	0.08 U	0.068 U	0.077 U	0.074 U
1,2-Dichlorobenzene	NA	NA	1800	9300	0.075 U	0.073 U	0.08 U	0.068 U	0.077 U	0.074 U
1,2-Diphenylhydrazine	NA	NA	0.68	2.9	0.075 U	0.073 U	0.08 U	0.068 U	0.077 U	0.074 U
1,3-Dichlorobenzene	NA	NA	NA	NA	0.075 U	0.073 U	0.08 U	0.068 U	0.077 U	0.074 U
1,4-Dichlorobenzene	NA	NA	2.6	11	0.075 U	0.073 U	0.08 U	0.068 U	0.077 U	0.074 U
1-Methylnaphthalene	NA	NA	18	73	0.038 UJ	0.037 U	0.04 U	0.034 U	0.039 U	0.037 U
2,2'-oxybis(1-Chloropropane)	2804	36274	3100	47000	0.075 U	0.073 U	0.08 U	0.068 U	0.077 U	0.074 U
2,4,5-Trichlorophenol	NA	NA	6300	82000	0.19 U	0.18 U	0.2 U	0.17 U	0.19 U	0.18 U
2,4,6-Trichlorophenol	NA	NA	49	210	0.19 U	0.18 U	0.2 U	0.17 U	0.19 U	0.18 U
2,4-Dichlorophenol	NA	NA	190	2500	0.19 U	0.18 U	0.2 U	0.17 U	0.19 U	0.18 U
2,4-Dimethylphenol	NA	NA	1300	16000	0.19 U	0.18 U	0.2 U	0.17 U	0.19 U	0.18 U
2,4-Dinitrophenol	NA	NA	130	1600	0.19 U	0.18 U	0.2 U	0.17 U	0.19 U	0.18 U
2,4-Dinitrotoluene	NA	NA	1.7	7.4	0.038 UJ	0.037 U	0.04 U	0.034 U	0.039 U	0.037 U
2,6-Dinitrotoluene	NA	NA	0.36	1.5	0.038 UJ	0.037 U	0.04 U	0.034 U	0.039 U	0.037 U
2-Chloronaphthalene	NA	NA	4800	60000	0.075 UJ	0.073 U	0.08 U	0.068 U	0.077 U	0.074 U
2-Chlorophenol	NA	NA	390	5800	0.075 U	0.073 U	0.08 U	0.068 U	0.077 U	0.074 U
2-Methylnaphthalene	NA	NA	240	3000	0.038 UJ	0.037 U	0.04 U	0.034 U	0.039 U	0.037 U
2-Methylphenol (o-Cresol)	NA	NA	3200	41000	0.075 U	0.073 U	0.08 U	0.068 U	0.077 U	0.074 U
2-Nitroaniline	NA	NA	630	8000	0.19 UJ	0.18 U	0.2 U	0.17 U	0.19 UJ	0.18 U
2-Nitrophenol	NA	NA	NA	NA	0.19 U	0.18 U	0.2 U	0.17 U	0.19 U	0.18 UJ
3&4-Methylphenol	NA	NA	NA	NA	0.075 U	0.073 U	0.08 U	0.068 U	0.077 U	0.074 U
3,3'-Dichlorobenzidine	NA	NA	1.2	5.1	0.075 UJ	0.073 U	0.08 U	0.068 U	0.077 U	0.074 U
3-Nitroaniline	NA	NA	NA	NA	0.19 UJ	0.18 U	0.2 U	0.17 U	0.19 U	0.18 U
4,6-Dinitro-2-methylphenol	NA	NA	5.1	66	0.19 U	0.18 U	0.2 U	0.17 U	0.19 U	0.18 U
4-Bromophenyl phenyl ether	NA	NA	NA	NA	0.075 U	0.073 U	0.08 U	0.068 U	0.077 U	0.074 U
4-Chloro-3-methylphenol	NA	NA	6300	82000	0.19 U	0.18 U	0.2 U	0.17 U	0.19 U	0.18 U
4-Chloroaniline	NA	NA	2.7	11	0.19 U	0.18 U	0.2 U	0.17 U	0.19 U	0.18 U
4-Chlorophenyl phenyl ether	NA	NA	NA	NA	0.075 UJ	0.073 U	0.08 U	0.068 U	0.077 U	0.074 U
4-Nitroaniline	NA	NA	27	110	0.19 UJ	0.18 U	0.2 U	0.17 U	0.19 U	0.18 U
4-Nitrophenol	NA	NA	NA	NA	0.38 U	0.37 U	0.4 U	0.34 U	0.39 U	0.37 U
Acenaphthene	NA	NA	3600	45000	0.038 UJ	0.037 U	0.04 U	0.034 U	0.039 U	0.037 U
Acenaphthylene	NA	NA	NA	NA	0.038 UJ	0.037 U	0.04 U	0.034 U	0.039 U	0.037 U
Aniline	NA	NA	95	400	0.075 U	0.073 U	0.08 U	0.068 U	0.077 U	0.074 U
Anthracene	NA	NA	18000	230000	0.038 UJ	0.037 U	0.04 U	0.034 U	0.039 U	0.037 U
Benzidine	NA	NA	0.00053	0.01	***0.38 UJ***	***0.37 U***	***0.4 U***	***0.34 U***	***0.39 U***	***0.37 U***
Benzo(a)anthracene	NA	NA	1.1	21	0.038 UJ	0.037 U	0.04 U	0.034 U	0.039 U	0.037 U
Benzo(a)pyrene	0.07	1.54	0.11	2.1	0.038 UJ	0.037 U	0.04 U	0.034 U	0.039 U	0.037 U
Benzo(b)fluoranthene	NA	NA	1.1	21	0.038 UJ	0.037 U	0.04 U	0.034 U	0.039 U	0.037 U
Benzo(g,h,i)perylene	NA	NA	NA	NA	0.038 UJ	0.037 U	0.04 U	0.034 U	0.039 U	0.037 U
Benzo(k)fluoranthene	NA	NA	11	210	0.038 UJ	0.037 U	0.04 U	0.034 U	0.039 U	0.037 U
Benzoic acid	NA	NA	250000	3.30E+06	0.75 U	0.73 U	0.8 U	0.68 U	0.77 UJ	0.74 U
Benzyl Alcohol	NA	NA	6300	82000	0.075 U	0.073 U	0.08 U	0.068 U	0.077 U	0.074 U
bis(2-Chloroethoxy)methane	NA	NA	190	2500	0.075 U	0.073 U	0.08 U	0.068 U	0.077 U	0.074 U
bis(2-Chloroethyl)ether	NA	NA	0.23	1	0.075 U	0.073 U	0.08 U	0.068 U	0.077 U	0.074 U
bis(2-Ethylhexyl)phthalate	20	120	39	160	0.075 UJ	0.073 U	0.0213 J	0.068 U	0.0473 J	0.047 J
Butyl benzylphthalate	NA	NA	290	1200	0.075 UJ	0.073 U	0.08 U	0.068 U	0.077 U	0.074 U
Carbazole	NA	NA	NA	NA	0.075 UJ	0.073 U	0.08 U	0.068 U	0.077 U	0.074 U
Chrysene	NA	NA	110	2100	0.038 UJ	0.037 U	0.04 U	0.034 U	0.039 U	0.037 U
Dibenz(a,h)anthracene	NA	NA	0.11	2.1	0.038 UJ	0.037 U	0.04 U	0.034 U	0.039 U	0.037 U
Dibenzofuran	NA	NA	73	1000	0.075 UJ	0.073 U	0.08 U	0.068 U	0.077 U	0.074 U
Diethyl phthalate	NA	NA	51000	660000	0.075 UJ	0.073 U	0.08 U	0.068 U	0.077 U	0.074 U
Dimethyl phthalate	NA	NA	NA	NA	0.075 UJ	0.073 U	0.08 U	0.068 U	0.077 U	0.074 U
Di-n-butylphthalate	NA	NA	6300	82000	0.075 UJ	0.073 U	0.08 U	0.068 U	0.077 U	0.074 U
Di-n-octyl phthalate	NA	NA	630	8200	0.075 UJ	0.073 U	0.08 U	0.068 U	0.077 U	0.074 U
Fluoranthene	2301	26371	2400	30000	0.038 UJ	0.037 U	0.04 U	0.034 U	0.039 U	0.037 U
Fluorene	2301	26371	2400	30000	0.038 UJ	0.037 U	0.04 U	0.034 U	0.039 U	0.037 U
Hexachlorobenzene	0.13	0.69	0.21	0.96	0.075 UJ	0.073 U	0.08 U	0.068 U	0.077 U	0.074 U
Hexachlorobutadiene	NA	NA	1.2	5.3	0.038 U	0.037 U	0.04 U	0.034 U	0.039 U	0.037 U
Hexachlorocyclopentadiene	NA	NA	1.8	7.5	0.38 UJ	0.37 U	0.4 U	0.34 U	0.39 U	0.37 U
Hexachloroethane	NA	NA	1.8	8	0.19 U	0.18 U	0.2 U	0.17 U	0.19 U	0.18 U
Indeno(1,2,3-cd)pyrene	NA	NA	1.1	21	0.038 UJ	0.037 U	0.04 U	0.034 U	0.039 U	0.037 U
Isophorone	NA	NA	570	2400	0.075 U	0.073 U	0.08 U	0.068 U	0.077 U	0.074 U
Naphthalene	2.7	16	3.8	17	0.038 U	0.037 U	0.04 U	0.034 U	0.039 U	0.037 U
Nitrobenzene	NA	NA	5.1	22	0.075 U	0.073 U	0.08 U	0.068 U	0.077 U	0.074 U
N-Nitrosodimethylamine	NA	NA	0.002	0.034	***0.075 UJ***	***0.073 U***	***0.08 U***	***0.068 U***	***0.077 U***	***0.074 UJ***
N-Nitrosodi-n-propylamine	NA	NA	0.078	0.33	0.075 U	0.073 U	**0.08 U**	0.068 U	0.077 U	0.074 U
N-Nitrosodiphenylamine	NA	NA	110	470	0.19 UJ	0.18 U	0.2 U	0.17 U	0.19 U	0.18 U
Pentachlorophenol	0.48	2.9	1	4	0.15 U	0.15 U	0.16 U	0.14 U	0.15 U	0.15 U
Phenanthrene	NA	NA	NA	NA	0.038 U	0.037 U	0.04 U	0.034 U	0.039 U	0.037 U
Phenol	NA	NA	19000	250000	0.075 U	0.073 U	0.08 U	0.068 U	0.077 U	0.074 U
Pyrene	NA	NA	1800	23000	0.038 UJ	0.037 U	0.04 U	0.034 U	0.039 U	0.037 U
Pyridine	NA	NA	78	1200	0.075 U	0.073 U	0.08 U	0.068 U	0.077 U	0.074 UJ
Benzo(a)Pyrene Equivalent (ND = 0 RL)	0.07	1.54	NA	NA	ND	ND	ND	ND	ND	ND
Benzo(a)Pyrene Equivalent (ND = 1/2 RL)	0.07	1.54	NA	NA	ND	ND	ND	ND	ND	ND

TABLE 5.11-1
AOC 11 - HAZARDOUS MATERIALS STORAGE: SOIL ANALYTICAL RESULTS COMPARED TO RESIDENTIAL AND NON-RESIDENTIAL SOIL CRITERIA
VERMONT YANKEE
VERNON, VERMONT

Location Name Sample Name Sample Date Lab Sample ID Sample Depth (bgs)	VT ANR 2019 Proposed Residential Soil	VT ANR 2019 Proposed Non-Residential Soil	USEPA RSL Residential Soil HI = 1.0 May 2019	USEPA RSL Industrial Soil HI = 1.0 May 2019	DP1101 DP110101 05/02/2019 JC87450-11 0 - 1 (ft)	DP1101 DP110107 05/02/2019 JC87450-12 5 - 7 (ft)	DP1102 DP110201 04/25/2019 JC86994-21 0 - 1 (ft)	DP1102 DP110229 04/25/2019 JC86994-22 29 - 30 (ft)	DP1103 DP110301 04/30/2019 JC87266-3 0 - 1 (ft)	DP1103 DP110318 04/30/2019 JC87266-4 18 - 20 (ft)
Total Petroleum Hydrocarbons (mg/kg)										
Total Petroleum Hydrocarbons (C10-C28) DRO	NA	NA	NA	NA	11 U	32.8	11 U	10 U	11 U	11 U
Total Petroleum Hydrocarbons (C6-C10) GRO	NA	NA	NA	NA	21 U	23 U	71 U	23 U	21 U	21 U
Inorganic Compounds (mg/kg)										
Aluminum	72507	941748	77000	1.10E+06	10200 J+	12200 J+	12700	5140	16000	5630
Antimony	26	319	31	470	2.4 UJ	2.4 UJ	2.5 UJ	2.1 UJ	2.4 U	2.4 U
Arsenic	16	16	0.68	3	4.5	3.8	6.5	2.8	6.1	2.4 U
Barium	11247	127382	15000	220000	29.4	42.9	42.4	21 U	40.3	24 U
Beryllium	35	289	160	2300	0.28	0.36	0.35	0.21 U	0.53	0.24 U
Cadmium	6.9	87	71	980	0.6 U	0.6 U	0.62 U	0.54 U	0.6 U	0.6 U
Calcium	NA	NA	NA	NA	1320	1480	1590	1350	1320	910
Chromium	NA	NA	NA	NA	18	18.9	21.1	10.4	25.4	10.3
Cobalt	22	291	23	350	7.4	7.8	9.3	5.4 U	10.9	8.6
Copper	10407	139231	3100	47000	17.6	14	20	5.4	21.5	6.9
Iron	51302	686351	55000	820000	16200	16300	19200	10100	26500	8720
Lead	400	800	400	800	8.4	7.3	11.3	2.9	11.3	2.8
Magnesium	NA	NA	NA	NA	4150	4150	5120	2700	5880	2720
Manganese	1118	11350	1800	26000	390	306	485	190	590	144
Mercury	3.1	3.1	11	46	0.037 U	0.035 U	0.04 U	0.033 U	0.032 U	0.036 U
Nickel	940	9707	1500	22000	19.5	19.6	24.7	11.3	25.7	12.4
Potassium	NA	NA	NA	NA	1200 U	1200 U	1200 U	1100 U	1350	1200 U
Selenium	366	4900	390	5800	2.4 U	2.4 U	2.5 U	2.1 U	4.8 U	2.4 U
Silver	237	2483	390	5800	0.6 U	0.6 U	0.62 U	0.54 U	1.2 U	0.6 U
Sodium	NA	NA	NA	NA	1200 U	1200 U	1200 U	1100 U	1200 U	1200 U
Thallium	0.73	196100	0.78	12	**1.2 U**	**1.2 U**	**1.2 U**	**1.1 U**	**2.4 U**	**1.2 U**
Vanadium	2.8	27	390	5800	**20.8**	**21.8**	**24.7**	**12.4**	***28.7***	**11.4**
Zinc	21986	294150	23000	350000	84.5	45.8	54	21.5	83.4	22.9
PCBs (mg/kg)										
Aroclor-1016 (PCB-1016)	NA	NA	4.1	27	0.038 U	0.038 U	0.039 U	0.033 U	0.038 U	0.038 U
Aroclor-1221 (PCB-1221)	NA	NA	0.2	0.83	0.038 U	0.038 U	0.039 U	0.033 U	0.038 U	0.038 U
Aroclor-1232 (PCB-1232)	NA	NA	0.17	0.72	0.038 U	0.038 U	0.039 U	0.033 U	0.038 U	0.038 U
Aroclor-1242 (PCB-1242)	NA	NA	0.23	0.95	0.038 U	0.038 U	0.039 U	0.033 U	0.038 U	0.038 U
Aroclor-1248 (PCB-1248)	NA	NA	0.23	0.95	0.038 U	0.038 U	0.039 U	0.033 U	0.038 U	0.038 U
Aroclor-1254 (PCB-1254)	NA	NA	0.24	0.97	0.038 U	0.038 U	0.039 U	0.033 U	0.038 U	0.038 U
Aroclor-1260 (PCB-1260)	NA	NA	0.24	0.99	0.038 U	0.038 U	0.039 U	0.033 U	0.038 U	0.038 U
Aroclor-1262 (PCB-1262)	NA	NA	NA	NA	0.038 U	0.038 U	0.039 U	0.033 U	0.038 U	0.038 U
Aroclor-1268 (PCB-1268)	NA	NA	NA	NA	0.038 U	0.038 U	0.039 U	0.033 U	0.038 U	0.038 U
SUM of PCBs	NA	NA	0.23	0.94	ND	ND	ND	ND	ND	ND
Other										
Total Solids (%)	NA	NA	NA	NA	86.2	86.4	81.8	96.3	82.8	83.9

ABBREVIATIONS AND NOTES:
-: Not Analyzed
*: Outside of QC limits
J: value is estimated
mg/kg: milligram per kilogram
NA: Not Applicable
RSL: Risk-Based Screening Levels
U: Not detected, value is the laboratory reporting limit
VT ANR: Vermont Agency of Natural Resources
USEPA: United State Environmental Protection Agency

- Volatile and Semi-Volatile analytes detected in at least one sample are reported herein. For a complete list of analytes see the laboratory data sheets.
- Bold values indicate an exceedance of the Proposed 2019 VT ANR Residential Soil values and the USEPA May 2019 Residential Soil RSL where no VT ANR value is available.
- Italicized values indicate an exceedance of the Proposed 2019 VT ANR Non-Residential Soil values and the USEPA May 2019 Industrial Soil RSL where no VT ANR value is available.

TABLE 5.12-1
AOC 12 - FORMER EDSON'S GULF STATION AND GARAGE: SOIL ANALYTICAL RESULTS COMPARED TO RESIDENTIAL AND NON-RESIDENTIAL SOIL CRITERIA
VERMONT YANKEE
VERNON, VERMONT

Location Name Sample Name Sample Date Lab Sample ID Sample Depth (bgs)	VT ANR 2019 Proposed Residential Soil	VT ANR 2019 Proposed Non-Residential Soil	USEPA RSL Residential Soil HI = 1.0 May 2019	USEPA RSL Industrial Soil HI = 1.0 May 2019	DP1201 DP120101 04/24/2019 JC86994-1 1 - 1.5 (ft)	DP1201 DP120113 04/24/2019 JC86994-2 13 - 14 (ft)	DP1202 DP120201 04/24/2019 JC86994-3 1 - 1.5 (ft)	DP1202 DP120213 04/24/2019 JC86994-4 13 - 14 (ft)	DP1203 DP120313 04/24/2019 JC86994-5 13 - 14 (ft)	DP1203 DP120318 04/24/2019 JC86994-6 16 - 18 (ft)	DP1204 DP120413 04/24/2019 JC86994-8 13 - 14 (ft)	DP1204 DP120417 04/24/2019 JC86994-7 17 - 19 (ft)	DP1205 DP120501 04/24/2019 JC86994-9 1 - 1.5 (ft)	DP1205 DP120513 04/24/2019 JC86994-10 13 - 14 (ft)	DP1206 DP120601 04/24/2019 JC86994-11 1 - 1.5 (ft)	DP1206 DP120613 04/24/2019 JC86994-12 13 - 14 (ft)	DP1209 DP120909 04/24/2019 JC86994-13 9 - 10 (ft)	DP1209 DP120918 04/24/2019 JC86994-14 18 - 20 (ft)
Volatile Organic Compounds (mg/kg)																		
1,1,1,2-Tetrachloroethane	1.3	8	2	8.8	0.0016 U	0.0019 U	0.002 U	0.0023 U	0.0023 U	0.0022 U	0.0025 U	0.0023 U	0.0023 U	0.0026 U	0.002 U	0.0019 U	0.0022 U	0.0024 U
1,1,1-Trichloroethane	NA	NA	8100	36000	0.0016 U	0.0019 U	0.002 U	0.0023 U	0.0023 U	0.0022 U	0.0025 U	0.0023 U	0.0023 U	0.0026 U	0.002 U	0.0019 U	0.0022 U	0.0024 U
1,1,2,2-Tetrachloroethane	NA	NA	0.6	2.7	0.0016 U	0.0019 U	0.002 U	0.0023 U	0.0023 U	0.0022 U	0.0025 U	0.0023 U	0.0023 U	0.0026 U	0.002 U	0.0019 U	0.0022 U	0.0024 U
1,1,2-Trichloroethane	NA	NA	1.1	5	0.0016 U	0.0019 U	0.002 U	0.0023 U	0.0023 U	0.0022 U	0.0025 U	0.0023 U	0.0023 U	0.0026 U	0.002 U	0.0019 U	0.0022 U	0.0024 U
1,1-Dichloroethane	2.1	13	3.6	16	0.0008 U	0.00096 U	0.001 U	0.0012 U	0.0011 U	0.0011 U	0.0012 U	0.0012 U	0.0011 U	0.0013 U	0.001 U	0.00095 U	0.0011 U	0.0012 U
1,1-Dichloroethene	NA	NA	230	1000	0.0008 U	0.00096 U	0.001 U	0.0012 U	0.0011 U	0.0011 U	0.0012 U	0.0012 U	0.0011 U	0.0013 U	0.001 U	0.00095 U	0.0011 U	0.0012 U
1,1-Dichloropropene	NA	NA	NA	NA	0.0016 U	0.0019 U	0.002 U	0.0023 U	0.0023 U	0.0022 U	0.0025 U	0.0023 U	0.0023 U	0.0026 U	0.002 U	0.0019 U	0.0022 U	0.0024 U
1,2,3-Trichlorobenzene	NA	NA	63	930	0.004 U	0.0048 U	0.005 U	0.0058 U	0.0057 U	0.0055 U	0.0062 U	0.0058 U	0.0057 U	0.0064 U	0.005 U	0.0047 U	0.0054 U	0.006 U
1,2,3-Trichloropropane	0.00311	0.07	0.0051	0.11	**0.004 U**	**0.0048 U**	**0.005 U**	**0.0058 U**	**0.0057 U**	**0.0055 U**	**0.0062 U**	**0.0058 U**	**0.0057 U**	**0.0064 U**	**0.005 U**	**0.0047 U**	**0.0054 U**	**0.006 U**
1,2,4-Trichlorobenzene	NA	NA	24	110	0.004 U	0.0048 U	0.005 U	0.0058 U	0.0057 U	0.0055 U	0.0062 U	0.0058 U	0.0057 U	0.0064 U	0.005 U	0.0047 U	0.0054 U	0.006 U
1,2,4-Trimethylbenzene	144	177	300	1800	0.0016 U	0.0019 U	0.002 U	0.0023 U	0.0023 U	0.0022 U	0.0025 U	0.0023 U	0.0023 U	0.0026 U	0.002 U	0.0019 U	0.0022 U	0.0024 U
1,2-Dibromo-3-chloropropane (DBCP)	0.01	0.06	0.0053	0.064	0.0016 U	0.0019 U	0.002 U	0.0023 U	0.0023 U	0.0022 U	0.0025 U	0.0023 U	0.0023 U	0.0026 U	0.002 U	0.0019 U	0.0022 U	0.0024 U
1,2-Dibromoethane (Ethylene Dibromide)	0.02	0.14	0.036	0.16	0.0008 U	0.00096 U	0.001 U	0.0012 U	0.0011 U	0.0011 U	0.0012 U	0.0012 U	0.0011 U	0.0013 U	0.001 U	0.00095 U	0.0011 U	0.0012 U
1,2-Dichlorobenzene	NA	NA	1800	9300	0.0008 U	0.00096 U	0.001 U	0.0012 U	0.0011 U	0.0011 U	0.0012 U	0.0012 U	0.0011 U	0.0013 U	0.001 U	0.00095 U	0.0011 U	0.0012 U
1,2-Dichloroethane	0.29	1.7	0.46	2	0.0008 U	0.00096 U	0.001 U	0.0012 U	0.0011 U	0.0011 U	0.0012 U	0.0012 U	0.0011 U	0.0013 U	0.001 U	0.00095 U	0.0011 U	0.0012 U
1,2-Dichloropropane	1.5	9.1	2.5	11	0.0016 U	0.0019 U	0.002 U	0.0023 U	0.0023 U	0.0022 U	0.0025 U	0.0023 U	0.0023 U	0.0026 U	0.002 U	0.0019 U	0.0022 U	0.0024 U
1,3,5-Trimethylbenzene	144	177	270	1500	0.0016 U	0.0019 U	0.002 U	0.0023 U	0.0023 U	0.0022 U	0.0025 U	0.0023 U	0.0023 U	0.0026 U	0.002 U	0.0019 U	0.0022 U	0.0024 U
1,3-Dichlorobenzene	NA	NA	NA	NA	0.0008 U	0.00096 U	0.001 U	0.0012 U	0.0011 U	0.0011 U	0.0012 U	0.0012 U	0.0011 U	0.0013 U	0.001 U	0.00095 U	0.0011 U	0.0012 U
1,3-Dichloropropane	NA	NA	1600	23000	0.0016 U	0.0019 U	0.002 U	0.0023 U	0.0023 U	0.0022 U	0.0025 U	0.0023 U	0.0023 U	0.0026 U	0.002 U	0.0019 U	0.0022 U	0.0024 U
1,4-Dichlorobenzene	NA	NA	2.6	11	0.0008 U	0.00096 U	0.001 U	0.0012 U	0.0011 U	0.0011 U	0.0012 U	0.0012 U	0.0011 U	0.0013 U	0.001 U	0.00095 U	0.0011 U	0.0012 U
2,2-Dichloropropane	NA	NA	NA	NA	0.0016 U	0.0019 U	0.002 U	0.0023 U	0.0023 U	0.0022 U	0.0025 U	0.0023 U	0.0023 U	0.0026 U	0.002 U	0.0019 U	0.0022 U	0.0024 U
2-Butanone (Methyl Ethyl Ketone)	16952	26991	27000	190000	0.008 U	0.0096 U	0.01 U	0.012 U	0.011 U	0.011 U	0.012 U	0.012 U	0.011 U	0.013 U	0.01 U	0.0095 U	0.011 U	0.012 U
2-Chlorotoluene	NA	NA	1600	23000	0.0016 U	0.0019 U	0.002 U	0.0023 U	0.0023 U	0.0022 U	0.0025 U	0.0023 U	0.0023 U	0.0026 U	0.002 U	0.0019 U	0.0022 U	0.0024 U
2-Phenylbutane (sec-Butylbenzene)	7009	102200	7800	120000	0.0016 U	0.0019 U	0.002 U	0.0023 U	0.0023 U	0.0022 U	0.0025 U	0.0023 U	0.0023 U	0.0026 U	0.002 U	0.0019 U	0.0022 U	0.0024 U
4-Chlorotoluene	NA	NA	1600	23000	0.0016 U	0.0019 U	0.002 U	0.0023 U	0.0023 U	0.0022 U	0.0025 U	0.0023 U	0.0023 U	0.0026 U	0.002 U	0.0019 U	0.0022 U	0.0024 U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	NA	NA	33000	140000	0.004 U	0.0048 U	0.005 U	0.0058 U	0.0057 U	0.0055 U	0.0062 U	0.0058 U	0.0057 U	0.0064 U	0.005 U	0.0047 U	0.0054 U	0.006 U
Acetone	40609	100028	61000	670000	0.008 UJ	0.0219 UJ	0.0238 UJ	0.012 UJ	0.017 UJ	0.0145 UJ	0.0134 UJ	0.0307 J	0.011 UJ	0.019 UJ	0.0335 J	0.0191 UJ	0.0408 J	0.0387 J
Benzene	0.7	4.2	1.2	5.1	0.0004 U	0.00048 U	0.0005 U	0.00058 U	0.00057 U	0.00055 U	0.00062 U	0.00058 U	0.00057 U	0.00064 U	0.0005 U	0.00047 U	0.00054 U	0.0006 U
Bromobenzene	NA	NA	290	1800	0.004 U	0.0048 U	0.005 U	0.0058 U	0.0057 U	0.0055 U	0.0062 U	0.0058 U	0.0057 U	0.0064 U	0.005 U	0.0047 U	0.0054 U	0.006 U
Bromodichloromethane	NA	NA	0.29	1.3	0.0016 U	0.0019 U	0.002 U	0.0023 U	0.0023 U	0.0022 U	0.0025 U	0.0023 U	0.0023 U	0.0026 U	0.002 U	0.0019 U	0.0022 U	0.0024 U
Bromoform	NA	NA	19	86	0.004 U	0.0048 U	0.005 U	0.0058 U	0.0057 U	0.0055 U	0.0062 U	0.0058 U	0.0057 U	0.0064 U	0.005 U	0.0047 U	0.0054 U	0.006 U
Bromomethane (Methyl Bromide)	NA	NA	6.8	30	0.004 U	0.0048 U	0.005 U	0.0058 U	0.0057 U	0.0055 U	0.0062 U	0.0058 U	0.0057 U	0.0064 U	0.005 U	0.0047 U	0.0054 U	0.006 U
Carbon tetrachloride	0.37	2.2	0.65	2.9	0.0016 U	0.0019 U	0.002 U	0.0023 U	0.0023 U	0.0022 U	0.0025 U	0.0023 U	0.0023 U	0.0026 U	0.002 U	0.0019 U	0.0022 U	0.0024 U
Chlorobenzene	414	726	280	1300	0.0016 U	0.0019 U	0.002 U	0.0023 U	0.0023 U	0.0022 U	0.0025 U	0.0023 U	0.0023 U	0.0026 U	0.002 U	0.0019 U	0.0022 U	0.0024 U
Chlorobromomethane	193	597	150	630	0.004 U	0.0048 U	0.005 U	0.0058 U	0.0057 U	0.0055 U	0.0062 U	0.0058 U	0.0057 U	0.0064 U	0.005 U	0.0047 U	0.0054 U	0.006 U
Chloroethane	NA	NA	14000	57000	0.004 U	0.0048 U	0.005 U	0.0058 U	0.0057 U	0.0055 U	0.0062 U	0.0058 U	0.0057 U	0.0064 U	0.005 U	0.0047 U	0.0054 U	0.006 U
Chloroform (Trichloromethane)	NA	NA	0.32	1.4	0.0016 U	0.0019 U	0.002 U	0.0023 U	0.0023 U	0.0022 U	0.0025 U	0.0023 U	0.0023 U	0.0026 U	0.002 U	0.0019 U	0.0022 U	0.0024 U
Chloromethane (Methyl Chloride)	NA	NA	110	460	0.004 U	0.0048 U	0.005 U	0.0058 U	0.0057 U	0.0055 U	0.0062 U	0.0058 U	0.0057 U	0.0064 U	0.005 U	0.0047 U	0.0054 U	0.006 U
cis-1,2-Dichloroethene	140	1814	160	2300	0.0008 U	0.00096 U	0.001 U	0.0012 U	0.0011 U	0.0011 U	0.0012 U	0.0012 U	0.0011 U	0.0013 U	0.001 U	0.00095 U	0.0011 U	0.0012 U
cis-1,3-Dichloropropene	NA	NA	NA	NA	0.0016 U	0.0019 U	0.002 U	0.0023 U	0.0023 U	0.0022 U	0.0025 U	0.0023 U	0.0023 U	0.0026 U	0.002 U	0.0019 U	0.0022 U	0.0024 U
Cymene (p-Isopropyltoluene)	NA	NA	NA	NA	0.0016 U	0.0019 U	0.002 U	0.0023 U	0.0023 U	0.0022 U	0.0025 U	0.0023 U	0.0023 U	0.0026 U	0.002 U	0.0019 U	0.0022 U	0.0024 U
Dibromochloromethane	NA	NA	8.3	39	0.0016 U	0.0019 U	0.002 U	0.0023 U	0.0023 U	0.0022 U	0.0025 U	0.0023 U	0.0023 U	0.0026 U	0.002 U	0.0019 U	0.0022 U	0.0024 U
Dibromomethane	NA	NA	24	99	0.004 U	0.0048 U	0.005 U	0.0058 U	0.0057 U	0.0055 U	0.0062 U	0.0058 U	0.0057 U	0.0064 U	0.005 U	0.0047 U	0.0054 U	0.006 U
Dichlorodifluoromethane (CFC-12)	NA	NA	87	370	0.004 U	0.0048 U	0.005 U	0.0058 U	0.0057 U	0.0055 U	0.0062 U	0.0058 U	0.0057 U	0.0064 U	0.005 U	0.0047 U	0.0054 U	0.006 U
Ethylbenzene	3.7	22	5.8	25	0.0008 U	0.00096 U	0.001 U	0.0012 U	0.0011 U	0.0011 U	0.0012 U	0.0012 U	0.0011 U	0.0013 U	0.001 U	0.00095 U	0.0011 U	0.0012 U
Hexachlorobutadiene	NA	NA	1.2	5.3	0.004 U	0.0048 U	0.005 U	0.0058 U	0.0057 U	0.0055 U	0.0062 U	0.0058 U	0.0057 U	0.0064 U	0.005 U	0.0047 U	0.0054 U	0.006 U
Isopropylbenzene (Cumene)	256	264	1900	9900	0.0016 U	0.0019 U	0.002 U	0.0023 U	0.0023 U	0.0022 U	0.0025 U	0.0023 U	0.0023 U	0.0026 U	0.002 U	0.0019 U	0.0022 U	0.0024 U
m,p-Xylenes	NA	NA	NA	NA	0.0008 U	0.00096 U	0.001 U	0.0012 U	0.0011 U	0.0011 U	0.0012 U	0.0012 U	0.0011 U	0.0013 U	0.001 U	0.00095 U	0.0011 U	0.0012 U
Methyl Tert Butyl Ether	649	4464	47	210	0.0008 U	0.00096 U	0.001 U	0.0012 U	0.0011 U	0.0011 U	0.0012 U	0.0012 U	0.0011 U	0.0013 U	0.001 U	0.00095 U	0.0011 U	0.0012 U
Methylene chloride	NA	NA	57	1000	0.004 U	0.0048 U	0.005 U	0.0058 U	0.0057 U	0.0055 U	0.0062 U	0.0058 U	0.0057 U	0.0064 U	0.005 U	0.0047 U	0.0054 U	0.006 U
Naphthalene	2.7	16	3.8	17	0.004 U	0.0048 U	0.005 U	0.0058 U	0.0057 U	0.0055 U	0.0062 U	0.0058 U	0.0057 U	0.0064 U	0.005 U	0.0047 U	0.0054 U	0.006 U
n-Butylbenzene	3504	51100	3900	58000	0.0016 U	0.0019 U	0.002 U	0.0023 U	0.0023 U	0.0022 U	0.0025 U	0.0023 U	0.0023 U	0.0026 U	0.002 U	0.0019 U	0.0022 U	0.0024 U
n-Propylbenzene	253	261	3800	24000	0.0016 U	0.0019 U	0.002 U	0.0023 U	0.0023 U	0.0022 U	0.0025 U	0.0023 U	0.0023 U	0.0026 U	0.002 U	0.0019 U	0.0022 U	0.0024 U
o-Xylene	NA	NA	650	2800	0.0008 U	0.00096 U	0.001 U	0.0012 U	0.0011 U	0.0011 U	0.0012 U	0.0012 U	0.0011 U	0.0013 U	0.001 U	0.00095 U	0.0011 U	0.0012 U
Styrene	NA	NA	6000	35000	0.0016 U	0.0019 U	0.002 U	0.0023 U	0.0023 U	0.0022 U	0.0025 U	0.0023 U	0.0023 U	0.0026 U	0.002 U	0.0019 U	0.0022 U	0.0024 U
tert-Butylbenzene	7009	102200	7800	120000	0.0016 U	0.0019 U	0.002 U	0.0023 U	0.0023 U	0.0022 U	0.0025 U	0.0023 U	0.0023 U	0.0026 U	0.002 U	0.0019 U	0.0022 U	0.0024 U
Tetrachloroethene	2.4	14	24	100	0.0016 U	0.0019 U	0.002 U	0.0023 U	0.0023 U	0.0022 U	0.0025 U	0.0023 U	0.0023 U	0.0026 U	0.002 U	0.0019 U	0.0022 U	0.0024 U
Toluene	706	798	4900	47000	0.0008 U	0.00096 U	0.001 U	0.0012 U	0.0011 U	0.0011 U	0.0012 U	0.0012 U	0.0011 U	0.0013 U	0.001 U	0.00095 U	0.0011 U	0.0012 U
trans-1,2-Dichloroethene	1402	18137	1600	23000	0.0008 U	0.00096 U	0.001 U	0.0012 U	0.0011 U	0.0011 U	0.0012 U	0.0012 U	0.0011 U	0.0013 U	0.001 U	0.00095 U	0.0011 U	0.0012 U
trans-1,3-Dichloropropene	NA	NA	NA	NA	0.0016 U	0.0019 U	0.002 U	0.0023 U	0.0023 U	0.0022 U	0.0025 U	0.0023 U	0.0023 U	0.0026 U	0.002 U	0.0019 U	0.0022 U	0.0024 U
Trichloroethene	0.68	6.5	0.94	6	0.0008 U	0.00096 U	0.001 U	0.0012 U	0.0011 U	0.0011 U	0.0012 U	0.0012 U	0.0011 U	0.0013 U	0.001 U	0.00095 U	0.0011 U	0.0012 U
Trichlorofluoromethane (CFC-11)	NA	NA	23000	350000	0.004 U	0.0048 U	0.005 U	0.0058 U	0.0057 U	0.0055 U	0.0062 U	0.0058 U	0.0057 U	0.0064 U	0.005 U	0.0047 U	0.0054 U	0.006 U
Vinyl chloride	0.1	0.59	0.059	1.7	0.0016 U	0.0019 U	0.002 U	0.0023 U	0.0023 U	0.0022 U	0.0025 U	0.0023 U	0.0023 U	0.0026 U	0.002 U	0.0019 U	0.0022 U	0.0024 U
Xylene (total)	252	257	580	2500	0.0008 U	0.00096 U	0.001 U	0.0012 U	0.0011 U	0.0011 U	0.0012 U	0.0012 U	0.0011 U	0.0013 U	0.001 U	0.00095 U	0.0011 U	0.0012 U

TABLE 5.12-1
AOC 12 - FORMER EDSON'S GULF STATION AND GARAGE: SOIL ANALYTICAL RESULTS COMPARED TO RESIDENTIAL AND NON-RESIDENTIAL SOIL CRITERIA
VERMONT YANKEE
VERNON, VERMONT

Location Name Sample Name Sample Date Lab Sample ID Sample Depth (bgs)	VT ANR 2019 Proposed Residential Soil	VT ANR 2019 Proposed Non-Residential Soil	USEPA RSL Residential Soil HI = 1.0 May 2019	USEPA RSL Industrial Soil HI = 1.0 May 2019	DP1201 DP120101 04/24/2019 JC86994-1 1 - 1.5 (ft)	DP1201 DP120113 04/24/2019 JC86994-2 13 - 14 (ft)	DP1202 DP120201 04/24/2019 JC86994-3 1 - 1.5 (ft)	DP1202 DP120213 04/24/2019 JC86994-4 13 - 14 (ft)	DP1203 DP120313 04/24/2019 JC86994-5 13 - 14 (ft)	DP1203 DP120318 04/24/2019 JC86994-6 16 - 18 (ft)	DP1204 DP120413 04/24/2019 JC86994-8 13 - 14 (ft)	DP1204 DP120417 04/24/2019 JC86994-7 17 - 19 (ft)	DP1205 DP120501 04/24/2019 JC86994-9 1 - 1.5 (ft)	DP1205 DP120513 04/24/2019 JC86994-10 13 - 14 (ft)	DP1206 DP120601 04/24/2019 JC86994-11 1 - 1.5 (ft)	DP1206 DP120613 04/24/2019 JC86994-12 13 - 14 (ft)	DP1209 DP120909 04/24/2019 JC86994-13 9 - 10 (ft)	DP1209 DP120918 04/24/2019 JC86994-14 18 - 20 (ft)
Semi-Volatile Organic Compounds (mg/kg)																		
1,2,4-Trichlorobenzene	NA	NA	24	110	0.073 U	0.071 U	0.071 U	0.077 U	0.068 U	0.079 U	0.069 U	0.086 U	0.074 U	0.07 U	0.069 U	0.068 U	0.069 U	0.08 U
1,2-Dichlorobenzene	NA	NA	1800	9300	0.073 U	0.071 U	0.071 U	0.077 U	0.068 U	0.079 U	0.069 U	0.086 U	0.074 U	0.07 U	0.069 U	0.068 U	0.069 U	0.08 U
1,2-Diphenylhydrazine	NA	NA	0.68	2.9	0.073 U	0.071 U	0.071 U	0.077 U	0.068 U	0.079 U	0.069 U	0.086 U	0.074 U	0.07 U	0.069 U	0.068 U	0.069 U	0.08 U
1,3-Dichlorobenzene	NA	NA	NA	NA	0.073 U	0.071 U	0.071 U	0.077 U	0.068 U	0.079 U	0.069 U	0.086 U	0.074 U	0.07 U	0.069 U	0.068 U	0.069 U	0.08 U
1,4-Dichlorobenzene	NA	NA	2.6	11	0.073 U	0.071 U	0.071 U	0.077 U	0.068 U	0.079 U	0.069 U	0.086 U	0.074 U	0.07 U	0.069 U	0.068 U	0.069 U	0.08 U
1-Methylnaphthalene	NA	NA	18	73	0.037 U	0.036 U	0.035 U	0.039 U	0.034 U	0.04 U	0.035 U	0.043 U	0.037 U	0.035 U	0.035 U	0.034 U	0.035 U	0.04 U
2,2'-oxybis(1-Chloropropane)	2804	36274	3100	47000	0.073 U	0.071 U	0.071 U	0.077 U	0.068 U	0.079 U	0.069 U	0.086 U	0.074 U	0.07 U	0.069 U	0.068 U	0.069 U	0.08 U
2,4,5-Trichlorophenol	NA	NA	6300	82000	0.18 U	0.18 U	0.18 U	0.19 U	0.17 U	0.2 U	0.17 U	0.22 U	0.19 U	0.17 U	0.17 U	0.17 U	0.17 U	0.2 U
2,4,6-Trichlorophenol	NA	NA	49	210	0.18 U	0.18 U	0.18 U	0.19 U	0.17 U	0.2 U	0.17 U	0.22 U	0.19 U	0.17 U	0.17 U	0.17 U	0.17 U	0.2 U
2,4-Dichlorophenol	NA	NA	190	2500	0.18 U	0.18 U	0.18 U	0.19 U	0.17 U	0.2 U	0.17 U	0.22 U	0.19 U	0.17 U	0.17 U	0.17 U	0.17 U	0.2 U
2,4-Dimethylphenol	NA	NA	1300	16000	0.18 U	0.18 U	0.18 U	0.19 U	0.17 U	0.2 U	0.17 U	0.22 U	0.19 U	0.17 U	0.17 U	0.17 U	0.17 U	0.2 U
2,4-Dinitrophenol	NA	NA	130	1600	0.18 U	0.18 U	0.18 U	0.19 U	0.17 U	0.2 U	0.17 U	0.22 U	0.19 U	0.17 U	0.17 U	0.17 U	0.17 U	0.2 U
2,4-Dinitrotoluene	NA	NA	1.7	7.4	0.037 U	0.036 U	0.035 U	0.039 U	0.034 U	0.04 U	0.035 U	0.043 U	0.037 U	0.035 U	0.035 U	0.034 U	0.035 U	0.04 U
2,6-Dinitrotoluene	NA	NA	0.36	1.5	0.037 U	0.036 U	0.035 U	0.039 U	0.034 U	0.04 U	0.035 U	0.043 U	0.037 U	0.035 U	0.035 U	0.034 U	0.035 U	0.04 U
2-Chloronaphthalene	NA	NA	4800	60000	0.073 U	0.071 U	0.071 U	0.077 U	0.068 U	0.079 U	0.069 U	0.086 U	0.074 U	0.07 U	0.069 U	0.068 U	0.069 U	0.08 U
2-Chlorophenol	NA	NA	390	5800	0.073 U	0.071 U	0.071 U	0.077 U	0.068 U	0.079 U	0.069 U	0.086 U	0.074 U	0.07 U	0.069 U	0.068 U	0.069 U	0.08 U
2-Methylnaphthalene	NA	NA	240	3000	0.037 U	0.036 U	0.035 U	0.039 U	0.034 U	0.04 U	0.035 U	0.043 U	0.037 U	0.035 U	0.035 U	0.034 U	0.035 U	0.04 U
2-Methylphenol (o-Cresol)	NA	NA	3200	41000	0.073 U	0.071 U	0.071 U	0.077 U	0.068 U	0.079 U	0.069 U	0.086 U	0.074 U	0.07 U	0.069 U	0.068 U	0.069 U	0.08 U
2-Nitroaniline	NA	NA	630	8000	0.18 U	0.18 U	0.18 U	0.19 U	0.17 U	0.2 U	0.17 U	0.22 U	0.19 U	0.17 U	0.17 U	0.17 U	0.17 U	0.2 U
2-Nitrophenol	NA	NA	NA	NA	0.18 U	0.18 U	0.18 U	0.19 U	0.17 U	0.2 U	0.17 U	0.22 U	0.19 U	0.17 U	0.17 U	0.17 U	0.17 U	0.2 U
3&4-Methylphenol	NA	NA	NA	NA	0.073 U	0.071 U	0.071 U	0.077 U	0.068 U	0.079 U	0.069 U	0.086 U	0.074 U	0.07 U	0.069 U	0.068 U	0.069 U	0.08 U
3,3'-Dichlorobenzidine	NA	NA	1.2	5.1	0.073 U	0.071 U	0.071 U	0.077 U	0.068 U	0.079 U	0.069 U	0.086 U	0.074 U	0.07 U	0.069 U	0.068 U	0.069 U	0.08 U
3-Nitroaniline	NA	NA	NA	NA	0.18 U	0.18 U	0.18 U	0.19 U	0.17 U	0.2 U	0.17 U	0.22 U	0.19 U	0.17 U	0.17 U	0.17 U	0.17 U	0.2 U
4,6-Dinitro-2-methylphenol	NA	NA	5.1	66	0.18 U	0.18 U	0.18 U	0.19 U	0.17 U	0.2 U	0.17 U	0.22 U	0.19 U	0.17 U	0.17 U	0.17 U	0.17 U	0.2 U
4-Bromophenyl phenyl ether	NA	NA	NA	NA	0.073 U	0.071 U	0.071 U	0.077 U	0.068 U	0.079 U	0.069 U	0.086 U	0.074 U	0.07 U	0.069 U	0.068 U	0.069 U	0.08 U
4-Chloro-3-methylphenol	NA	NA	6300	82000	0.18 U	0.18 U	0.18 U	0.19 U	0.17 U	0.2 U	0.17 U	0.22 U	0.19 U	0.17 U	0.17 U	0.17 U	0.17 U	0.2 U
4-Chloroaniline	NA	NA	2.7	11	0.18 U	0.18 U	0.18 U	0.19 U	0.17 U	0.2 U	0.17 U	0.22 U	0.19 U	0.17 U	0.17 U	0.17 U	0.17 U	0.2 U
4-Chlorophenyl phenyl ether	NA	NA	NA	NA	0.073 U	0.071 U	0.071 U	0.077 U	0.068 U	0.079 U	0.069 U	0.086 U	0.074 U	0.07 U	0.069 U	0.068 U	0.069 U	0.08 U
4-Nitroaniline	NA	NA	27	110	0.18 U	0.18 U	0.18 U	0.19 U	0.17 U	0.2 U	0.17 U	0.22 U	0.19 U	0.17 U	0.17 U	0.17 U	0.17 U	0.2 U
4-Nitrophenol	NA	NA	NA	NA	0.37 U	0.36 U	0.35 U	0.39 U	0.34 U	0.4 U	0.35 U	0.43 U	0.37 U	0.35 U	0.35 U	0.34 U	0.35 U	0.4 U
Acenaphthene	NA	NA	3600	45000	0.037 U	0.036 U	0.035 U	0.039 U	0.034 U	0.04 U	0.035 U	0.043 U	0.037 U	0.035 U	0.035 U	0.034 U	0.035 U	0.04 U
Acenaphthylene	NA	NA	NA	NA	0.037 U	0.036 U	0.035 U	0.039 U	0.034 U	0.04 U	0.035 U	0.043 U	0.037 U	0.035 U	0.035 U	0.034 U	0.035 U	0.04 U
Aniline	NA	NA	95	400	0.073 U	0.071 U	0.071 U	0.077 U	0.068 U	0.079 U	0.069 U	0.086 U	0.074 U	0.07 U	0.069 U	0.068 U	0.069 U	0.08 U
Anthracene	NA	NA	18000	230000	0.037 U	0.036 U	0.035 U	0.039 U	0.034 U	0.04 U	0.035 U	0.043 U	0.037 U	0.035 U	0.035 U	0.034 U	0.035 U	0.04 U
Benzidine	NA	NA	0.00053	0.01	***0.37 U***	***0.36 U***	***0.35 U***	***0.39 U***	***0.34 U***	***0.4 U***	***0.35 U***	***0.43 U***	***0.37 U***	***0.35 U***	***0.35 U***	***0.34 U***	***0.35 U***	***0.4 U***
Benzo(a)anthracene	NA	NA	1.1	21	0.0248 J	0.036 U	0.035 U	0.039 U	0.0217 J	0.04 U	0.035 U	0.043 U	0.0478	0.035 U	0.035 U	0.034 U	0.035 U	0.04 U
Benzo(a)pyrene	0.07	1.54	0.11	2.1	0.0239 J	0.036 U	0.035 U	0.039 U	0.0289 J	0.04 U	0.035 U	0.043 U	0.0485	0.035 U	0.035 U	0.034 U	0.035 U	0.04 U
Benzo(b)fluoranthene	NA	NA	1.1	21	0.0284 J	0.036 U	0.035 U	0.039 U	0.0373	0.04 U	0.035 U	0.043 U	0.056	0.035 U	0.035 U	0.034 U	0.035 U	0.04 U
Benzo(g,h,i)perylene	NA	NA	NA	NA	0.021 J	0.036 U	0.035 U	0.039 U	0.0223 J	0.04 U	0.035 U	0.043 U	0.034 J	0.035 U	0.035 U	0.034 U	0.035 U	0.04 U
Benzo(k)fluoranthene	NA	NA	11	210	0.037 U	0.036 U	0.035 U	0.039 U	0.034 U	0.04 U	0.035 U	0.043 U	0.0203 J	0.035 U	0.035 U	0.034 U	0.035 U	0.04 U
Benzoic acid	NA	NA	250000	3.30E+06	0.73 U	0.71 U	0.71 U	0.77 U	0.68 U	0.79 U	0.69 U	0.86 U	0.74 U	0.7 U	0.69 U	0.68 U	0.69 U	0.8 U
Benzyl Alcohol	NA	NA	6300	82000	0.073 U	0.071 U	0.071 U	0.077 U	0.068 U	0.079 U	0.069 U	0.086 U	0.074 U	0.07 U	0.069 U	0.068 U	0.069 U	0.08 U
bis(2-Chloroethoxy)methane	NA	NA	190	2500	0.073 U	0.071 U	0.071 U	0.077 U	0.068 U	0.079 U	0.069 U	0.086 U	0.074 U	0.07 U	0.069 U	0.068 U	0.069 U	0.08 U
bis(2-Chloroethyl)ether	NA	NA	0.23	1	0.073 U	0.071 U	0.071 U	0.077 U	0.068 U	0.079 U	0.069 U	0.086 U	0.074 U	0.07 U	0.069 U	0.068 U	0.069 U	0.08 U
bis(2-Ethylhexyl)phthalate	20	120	39	160	0.073 U	0.071 U	0.071 U	0.077 U	0.068 U	0.079 U	0.069 U	0.086 U	0.0354 J	0.07 U	0.069 U	0.068 U	0.069 U	0.08 U
Butyl benzylphthalate	NA	NA	290	1200	0.073 U	0.071 U	0.071 U	0.077 U	0.068 U	0.079 U	0.069 U	0.086 U	0.074 U	0.07 U	0.069 U	0.068 U	0.069 U	0.08 U
Carbazole	NA	NA	NA	NA	0.073 U	0.071 U	0.071 U	0.077 U	0.068 U	0.079 U	0.069 U	0.086 U	0.074 U	0.07 U	0.069 U	0.068 U	0.069 U	0.08 U
Chrysene	NA	NA	110	2100	0.0227 J	0.036 U	0.035 U	0.039 U	0.0199 J	0.04 U	0.035 U	0.043 U	0.0426	0.035 U	0.035 U	0.034 U	0.035 U	0.04 U
Dibenz(a,h)anthracene	NA	NA	0.11	2.1	0.037 U	0.036 U	0.035 U	0.039 U	0.034 U	0.04 U	0.035 U	0.043 U	0.037 U	0.035 U	0.035 U	0.034 U	0.035 U	0.04 U
Dibenzofuran	NA	NA	73	1000	0.073 U	0.071 U	0.071 U	0.077 U	0.068 U	0.079 U	0.069 U	0.086 U	0.074 U	0.07 U	0.069 U	0.068 U	0.069 U	0.08 U
Diethyl phthalate	NA	NA	51000	660000	0.073 U	0.071 U	0.071 U	0.077 U	0.068 U	0.079 U	0.069 U	0.086 U	0.074 U	0.07 U	0.069 U	0.068 U	0.069 U	0.08 U
Dimethyl phthalate	NA	NA	NA	NA	0.073 U	0.071 U	0.071 U	0.077 U	0.068 U	0.079 U	0.069 U	0.086 U	0.074 U	0.07 U	0.069 U	0.068 U	0.069 U	0.08 U
Di-n-butylphthalate	NA	NA	6300	82000	0.073 U	0.071 U	0.071 U	0.077 U	0.068 U	0.079 U	0.069 U	0.086 U	0.074 U	0.07 U	0.069 U	0.068 U	0.069 U	0.08 U
Di-n-octyl phthalate	NA	NA	630	8200	0.073 U	0.071 U	0.071 U	0.077 U	0.068 U	0.079 U	0.069 U	0.086 U	0.074 U	0.07 U	0.069 U	0.068 U	0.069 U	0.08 U
Fluoranthene	2301	26371	2400	30000	0.0432	0.036 U	0.035 U	0.039 U	0.034 U	0.04 U	0.035 U	0.043 U	0.0824	0.035 U	0.035 U	0.034 U	0.035 U	0.04 U
Fluorene	2301	26371	2400	30000	0.037 U	0.036 U	0.035 U	0.039 U	0.034 U	0.04 U	0.035 U	0.043 U	0.037 U	0.035 U	0.035 U	0.034 U	0.035 U	0.04 U
Hexachlorobenzene	0.13	0.69	0.21	0.96	0.073 U	0.071 U	0.071 U	0.077 U	0.068 U	0.079 U	0.069 U	0.086 U	0.074 U	0.07 U	0.069 U	0.068 U	0.069 U	0.08 U
Hexachlorobutadiene	NA	NA	1.2	5.3	0.037 U	0.036 U	0.035 U	0.039 U	0.034 U	0.04 U	0.035 U	0.043 U	0.037 U	0.035 U	0.035 U	0.034 U	0.035 U	0.04 U
Hexachlorocyclopentadiene	NA	NA	1.8	7.5	0.37 U	0.36 U	0.35 U	0.39 U	0.34 U	0.4 U	0.35 U	0.43 U	0.37 U	0.35 U	0.35 U	0.34 U	0.35 U	0.4 U
Hexachloroethane	NA	NA	1.8	8	0.18 U	0.18 U	0.18 U	0.19 U	0.17 U	0.2 U	0.17 U	0.22 U	0.19 U	0.17 U	0.17 U	0.17 U	0.17 U	0.2 U
Indeno(1,2,3-cd)pyrene	NA	NA	1.1	21	0.037 U	0.036 U	0.035 U	0.039 U	0.0206 J	0.04 U	0.035 U	0.043 U	0.0268 J	0.035 U	0.035 U	0.034 U	0.035 U	0.04 U
Isophorone	NA	NA	570	2400	0.073 U	0.071 U	0.071 U	0.077 U	0.068 U	0.079 U	0.069 U	0.086 U	0.074 U	0.07 U	0.069 U	0.068 U	0.069 U	0.08 U
Naphthalene	2.7	16	3.8	17	0.037 U	0.036 U	0.035 U	0.039 U	0.034 U	0.04 U	0.035 U	0.043 U	0.037 U	0.035 U	0.035 U	0.034 U	0.035 U	0.04 U
Nitrobenzene	NA	NA	5.1	22	0.073 U	0.071 U	0.071 U	0.077 U	0.068 U	0.079 U	0.069 U	0.086 U	0.074 U	0.07 U	0.069 U	0.068 U	0.069 U	0.08 U
N-Nitrosodimethylamine	NA	NA	0.002	0.034	***0.073 U***	***0.071 U***	***0.071 U***	***0.077 U***	***0.068 U***	***0.079 U***	***0.069 U***	***0.086 U***	***0.074 U***	***0.07 U***	***0.069 U***	***0.068 U***	***0.069 U***	***0.08 U***
N-Nitrosodi-n-propylamine	NA	NA	0.078	0.33	0.073 U	0.071 U	0.071 U	0.077 U	0.068 U	**0.079 U**	0.069 U	**0.086 U**	0.074 U	0.07 U	0.069 U	0.068 U	0.069 U	**0.08 U**
N-Nitrosodiphenylamine	NA	NA	110	470	0.18 U	0.18 U	0.18 U	0.19 U	0.17 U	0.2 U	0.17 U	0.22 U	0.19 U	0.17 U	0.17 U	0.17 U	0.17 U	0.2 U
Pentachlorophenol	0.48	2.9	1	4	0.15 U	0.14 U	0.14 U	0.15 U	0.14 U	0.16 U	0.14 U	0.17 U	0.15 U	0.14 U	0.14 U	0.14 U	0.14 U	0.16 U
Phenanthrene	NA	NA	NA	NA	0.0241 J	0.036 U	0.035 U	0.039 U	0.034 U	0.04 U	0.035 U	0.043 U	0.0434	0.035 U	0.035 U	0.034 U	0.035 U	0.04 U
Phenol	NA	NA	19000	250000	0.073 U	0.071 U	0.071 U	0.077 U	0.068 U	0.079 U	0.069 U	0.086 U	0.074 U	0.07 U	0.069 U	0.068 U	0.069 U	0.08 U
Pyrene	NA	NA	1800	23000	0.0456	0.036 U	0.035 U	0.039 U	0.0118 J	0.04 U	0.035 U	0.043 U	0.0861	0.035 U	0.035 U	0.034 U	0.035 U	0.04 U
Pyridine	NA	NA	78	1200	0.073 U	0.071 U	0.071 U	0.077 U	0.068 U	0.079 U	0.069 U	0.086 U	0.074 U	0.07 U	0.069 U	0.068 U	0.069 U	0.08 U
Benzo(a)Pyrene Equivalent (ND = 0 RL)	0.07	1.54	NA	NA	0.029	ND	ND	ND	0.037	ND	ND	ND	0.062	ND	ND	ND	ND	ND
Benzo(a)Pyrene Equivalent (ND = 1/2 RL)	0.07	1.54	NA	NA	0.050	ND	ND	ND	0.054	ND	ND	ND	**0.080**	ND	ND	ND	ND	ND

TABLE 5.12-1
AOC 12 - FORMER EDSON'S GULF STATION AND GARAGE: SOIL ANALYTICAL RESULTS COMPARED TO RESIDENTIAL AND NON-RESIDENTIAL SOIL CRITERIA
VERMONT YANKEE
VERNON, VERMONT

Location Name Sample Name Sample Date Lab Sample ID Sample Depth (bgs)	VT ANR 2019 Proposed Residential Soil	VT ANR 2019 Proposed Non-Residential Soil	USEPA RSL Residential Soil HI = 1.0 May 2019	USEPA RSL Industrial Soil HI = 1.0 May 2019	DP1201 DP120101 04/24/2019 JC86994-1 1 - 1.5 (ft)	DP1201 DP120113 04/24/2019 JC86994-2 13 - 14 (ft)	DP1202 DP120201 04/24/2019 JC86994-3 1 - 1.5 (ft)	DP1202 DP120213 04/24/2019 JC86994-4 13 - 14 (ft)	DP1203 DP120313 04/24/2019 JC86994-5 13 - 14 (ft)	DP1203 DP120318 04/24/2019 JC86994-6 16 - 18 (ft)	DP1204 DP120413 04/24/2019 JC86994-8 13 - 14 (ft)	DP1204 DP120417 04/24/2019 JC86994-7 17 - 19 (ft)	DP1205 DP120501 04/24/2019 JC86994-9 1 - 1.5 (ft)	DP1205 DP120513 04/24/2019 JC86994-10 13 - 14 (ft)	DP1206 DP120601 04/24/2019 JC86994-11 1 - 1.5 (ft)	DP1206 DP120613 04/24/2019 JC86994-12 13 - 14 (ft)	DP1209 DP120909 04/24/2019 JC86994-13 9 - 10 (ft)	DP1209 DP120918 04/24/2019 JC86994-14 18 - 20 (ft)
Total Petroleum Hydrocarbons (mg/kg)																		
Total Petroleum Hydrocarbons (C10-C28) DRO	NA	NA	NA	NA	11 U	10 U	10 U	11 U	9.8 U	11 U	9.2 U	12 U	15.5	9.4 U	9 U	10 U	9.4 U	11 U
Total Petroleum Hydrocarbons (C6-C10) GRO	NA	NA	NA	NA	25 U	24 U	24 U	26 U	22 U	25 U	26 U	26 U	25 U	29 U	24 U	23 U	17 U	20 U
Inorganic Compounds (mg/kg)																		
Aluminum	72507	941748	77000	1.10E+06	11600	6180	9060	6100	6080	5520	7580	5730	8350	5330	5880	10300	6650	5530
Antimony	26	319	31	470	2.2 UJ	2.1 UJ	2.1 UJ	2.3 UJ	2.1 UJ	2.3 UJ	4 UJ	2.5 UJ	2.2 UJ	2.2 UJ	2.1 UJ	2 UJ	2 UJ	2.3 UJ
Arsenic	16	16	0.68	3	5.3	3	4.9	4.2	4.5	2.9	4.8	3	3.7	3.4	2.8	7.4	3.2	3.1
Barium	11247	127382	15000	220000	35.2	22.7	22.9	23 U	25	41.8	41.8	25 U	23	28.1	73.5	25.3	46.5	33.2
Beryllium	35	289	160	2300	0.25	0.21 U	0.23	0.23 U	0.21 U	0.23 U	0.2	0.25 U	0.22 U	0.22 U	0.21 U	0.27	0.2 U	0.23 U
Cadmium	6.9	87	71	980	0.54 U	0.52 U	0.52 U	0.57 U	0.51 U	0.58 U	0.5 U	0.62 U	0.56 U	0.54 U	0.52 U	0.51 U	0.5 U	0.58 U
Calcium	NA	NA	NA	NA	2890	1100	1520	890	1480	970	745	1190	1930	1270	957	981	1150	873
Chromium	NA	NA	NA	NA	17.8	9.7	17.3	10.7	10.9	9.3	17.1	10.8	15	9	13.5	16.8	11.5	9
Cobalt	22	291	23	350	7.9	5.4	7.6	5.7 U	6.8	10.7	7.1	6.2 U	5.8	5.4 U	8.6	8	6.7	7.5
Copper	10407	139231	3100	47000	24.9	7.6	16.6	6	7	7.5	8.1	6.2	14.6	7	6.2	17.4	7.9	6.5
Iron	51302	686351	55000	820000	21000	12300	16000	14000	15400	11400	21500	13600	18600	11600	12000	19900	13800	11700
Lead	400	800	400	800	12.3	3.6	13.9	3	3.1	3.2	4 U	3.2	8.4	2.4	3.1	7.3	2.9	2.9
Magnesium	NA	NA	NA	NA	5670	3340	4660	3330	2970	2690	4070	2830	4530	2390	3660	4800	3620	2670
Manganese	1118	11350	1800	26000	362	434	257	273	561	**1530**	573	359	271	392	**1170**	256	890	**1970**
Mercury	3.1	3.1	11	46	0.23	0.03 U	0.033 U	0.032 U	0.034 U	0.036 U	0.029 U	0.041 U	1.3	0.032 U	0.034 U	0.031 U	0.028 U	0.037 U
Nickel	940	9707	1500	22000	20.1	14.2	19.3	15.3	14.7	17	19	17.5	15.5	12.3	21.8	21.6	17	19.5
Potassium	NA	NA	NA	NA	1130	1000 U	1070	1100 U	1000 U	1200 U	1000 U	1200 U	1100 U	1100 U	1000 U	1060	1000 U	1200 U
Selenium	366	4900	390	5800	2.2 U	2.1 U	2.1 U	2.3 U	2.1 U	2.3 U	4 U	2.5 U	2.2 U	2.2 U	2.1 U	2 U	2 U	2.3 U
Silver	237	2483	390	5800	0.54 U	0.52 U	0.52 U	0.57 U	0.51 U	0.58 U	1 U	0.62 U	0.56 U	0.54 U	0.52 U	0.51 U	0.5 U	0.58 U
Sodium	NA	NA	NA	NA	1100 U	1000 U	1000 U	1100 U	1000 U	1200 U	1000 U	1200 U	1100 U	1100 U	1000 U	1000 U	1000 U	1200 U
Thallium	0.73	196100	0.78	12	**1.1 U**	**1 U**	**1 U**	**1.1 U**	**1 U**	**2.3 U**	**2 U**	**1.2 U**	**1.1 U**	**1.1 U**	**2.1 U**	**1 U**	**2 U**	**3.5 U**
Vanadium	2.8	27	390	5800	***27.3***	**12.1**	**19.5**	**14.3**	**15.6**	**10.3**	**16.2**	**11.5**	**19.8**	**11.1**	**13.4**	**18.8**	**14.4**	**10**
Zinc	21986	294150	23000	350000	68.6	23	42.4	25.2	23.4	21.4	25.1	25.5	47.3	19.8	22.8	40.1	24.6	22
PCBs (mg/kg)																		
Aroclor-1016 (PCB-1016)	NA	NA	4.1	27	-	-	-	-	0.033 U	0.037 U	0.031 U	0.041 U	-	-	-	-	0.031 U	0.04 U
Aroclor-1221 (PCB-1221)	NA	NA	0.2	0.83	-	-	-	-	0.033 U	0.037 U	0.031 U	0.041 U	-	-	-	-	0.031 U	0.04 U
Aroclor-1232 (PCB-1232)	NA	NA	0.17	0.72	-	-	-	-	0.033 U	0.037 U	0.031 U	0.041 U	-	-	-	-	0.031 U	0.04 U
Aroclor-1242 (PCB-1242)	NA	NA	0.23	0.95	-	-	-	-	0.033 U	0.037 U	0.031 U	0.041 U	-	-	-	-	0.031 U	0.04 U
Aroclor-1248 (PCB-1248)	NA	NA	0.23	0.95	-	-	-	-	0.033 U	0.037 U	0.031 U	0.041 U	-	-	-	-	0.031 U	0.04 U
Aroclor-1254 (PCB-1254)	NA	NA	0.24	0.97	-	-	-	-	0.033 U	0.037 U	0.031 U	0.041 U	-	-	-	-	0.031 U	0.04 U
Aroclor-1260 (PCB-1260)	NA	NA	0.24	0.99	-	-	-	-	0.033 U	0.037 U	0.031 U	0.041 U	-	-	-	-	0.031 U	0.04 U
Aroclor-1262 (PCB-1262)	NA	NA	NA	NA	-	-	-	-	0.033 U	0.037 U	0.031 U	0.041 U	-	-	-	-	0.031 U	0.04 U
Aroclor-1268 (PCB-1268)	NA	NA	NA	NA	-	-	-	-	0.033 U	0.037 U	0.031 U	0.041 U	-	-	-	-	0.031 U	0.04 U
SUM of PCBs	NA	NA	0.23	0.94	-	-	-	-	ND	ND	ND	ND	-	-	-	-	ND	ND
Other																		
Total Solids (%)	NA	NA	NA	NA	91.1	93.4	93.9	84.8	95.5	83.4	95.7	77.4	89.4	94.9	94.7	95.9	95.7	82.8

ABBREVIATIONS AND NOTES:
-: Not Analyzed
*: Outside of QC limits
J: value is estimated
mg/kg: milligram per kilogram
NA: Not Applicable
RSL: Risk-Based Screening Levels
U: Not detected, value is the laboratory reporting limit
VT ANR: Vermont Agency of Natural Resources
USEPA: United State Environmental Protection Agency

- Volatile and Semi-Volatile analytes detected in at least one sample are reported herein. For a complete list of analytes see the laboratory data sheets.
- Bold values indicate an exceedance of the Proposed 2019 VT ANR Residential Soil values and the USEPA May 2019 Residential Soil RSL where no VT ANR value is available.
- Italicized values indicate an exceedance of the Proposed 2019 VT ANR Non-Residential Soil values and the USEPA May 2019 Industrial Soil RSL where no VT ANR value is available.

TABLE 5.12-2
AOC 12 - FORMER EDSON'S GULF STATION AND GARAGE: GROUNDWATER ANALYTICAL RESULTS COMPARED TO GROUNDWATER ENFORCEMENT STANDARDS
VERMONT YANKEE
VERNON, VERMONT

Location Name Sample Name Sample Date Lab Sample ID	VT ANR Proposed 2019 Groundwater Enforcement	DP1201 GW1201-20190509 05/09/2019 JC87972-2	DP1202 GW1202-20190509 05/09/2019 JC87972-3	DP1209 GW1209-20190426 04/26/2019 JC87127-6
Volatile Organic Compounds (ug/L)				
1,1,1,2-Tetrachloroethane	70	1 U	1 U	1 U
1,1,1-Trichloroethane	200	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	NA	1 U	1 U	1 U
1,1,2-Trichloroethane	5	1 U	1 U	1 U
1,1-Dichloroethane	70	1 U	1 U	1 U
1,1-Dichloroethene	7	1 U	1 U	1 U
1,1-Dichloropropene	NA	1 U	1 U	1 U
1,2,3-Trichlorobenzene	0.9	**1 U**	**1 U**	**1 U**
1,2,3-Trichloropropane	0.02	**2 U**	**2 U**	**2 U**
1,2,4-Trichlorobenzene	70	1 U	1 U	1 U
1,2,4-Trimethylbenzene	23	2 U	2 U	2 U
1,2-Dibromo-3-chloropropane (DBCP)	0.2	**2 U**	**2 U**	**2 U**
1,2-Dibromoethane (Ethylene Dibromide)	0.05	**1 U**	**1 U**	**1 U**
1,2-Dichlorobenzene	600	1 U	1 U	1 U
1,2-Dichloroethane	5	1 U	1 U	1 U
1,2-Dichloropropane	5	1 U	1 U	1 U
1,3,5-Trimethylbenzene	23	2 U	2 U	2 U
1,3-Dichlorobenzene	600	1 U	1 U	1 U
1,3-Dichloropropane	NA	1 U	1 U	1 U
1,4-Dichlorobenzene	75	1 U	1 U	1 U
2,2-Dichloropropane	NA	1 U	1 U	1 U
2-Butanone (Methyl Ethyl Ketone)	511	10 U	10 U	10 U
2-Chlorotoluene	NA	2 U	2 U	2 U
2-Phenylbutane (sec-Butylbenzene)	NA	2 U	2 U	2 U
4-Chlorotoluene	NA	2 U	2 U	2 U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	NA	5 U	5 U	5 U
Acetone	950	10 U	10 U	10 U
Benzene	5	0.5 U	0.5 U	0.5 U
Bromobenzene	NA	1 U	1 U	1 U
Bromodichloromethane	NA	1 U	1 U	1 U
Bromoform	NA	1 U	1 U	1 U
Bromomethane (Methyl Bromide)	5	2 U	2 U	2 U
Carbon tetrachloride	5	1 U	1 U	1 U
Chlorobenzene	100	1 U	1 U	1 U
Chlorobromomethane	8	1 U	1 U	1 U
Chloroethane	NA	1 U	1 U	1 U
Chloroform (Trichloromethane)	NA	1 U	1 U	1 U
Chloromethane (Methyl Chloride)	NA	1 U	1 U	1 U
cis-1,2-Dichloroethene	70	1 U	1 U	1 U
cis-1,3-Dichloropropene	NA	1 U	1 U	1 U
Cymene (p-Isopropyltoluene)	NA	2 U	2 U	2 U
Dibromochloromethane	NA	1 U	1 U	1 U
Dibromomethane	NA	1 U	1 U	1 U
Dichlorodifluoromethane (CFC-12)	NA	2 U	2 U	2 U
Ethylbenzene	700	1 U	1 U	1 U
Hexachlorobutadiene	NA	2 U	2 U	2 U
Isopropylbenzene (Cumene)	NA	1 U	1 U	1 U
m,p-Xylenes	NA	1 U	1 U	1 U
Methyl Tert Butyl Ether	11	1 U	1 U	1 U
Methylene chloride	5	2 U	2 U	2 U
Naphthalene	0.5	**5 U**	**5 U**	**5 U**
n-Butylbenzene	NA	2 U	2 U	2 U
n-Propylbenzene	NA	2 U	2 U	2 U
o-Xylene	NA	1 U	1 U	1 U
Styrene	100	1 U	1 U	1 U
tert-Butylbenzene	NA	2 U	2 U	2 U
Tetrachloroethene	5	1 U	1 U	1 U
Toluene	1000	1 U	1 U	1 U
trans-1,2-Dichloroethene	100	1 U	1 U	1 U
trans-1,3-Dichloropropene	NA	1 U	1 U	1 U
Trichloroethene	5	1 U	1 U	1 U
Trichlorofluoromethane (CFC-11)	NA	2 U	2 U	2 U
Vinyl chloride	2	1 U	1 U	1 U
Xylene (total)	10000	1 U	1 U	1 U

TABLE 5.12-2
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VERMONT YANKEE
VERNON, VERMONT

Location Name Sample Name Sample Date Lab Sample ID	VT ANR Proposed 2019 Groundwater Enforcement	DP1201 GW1201-20190509 05/09/2019 JC87972-2	DP1202 GW1202-20190509 05/09/2019 JC87972-3	DP1209 GW1209-20190426 04/26/2019 JC87127-6
Semi-Volatile Organic Compounds (ug/L)				
1,2,4-Trichlorobenzene	70	0.96 U	1 U	0.95 U
1,2-Dichlorobenzene	600	0.96 U	1 U	0.95 U
1,2-Diphenylhydrazine	NA	0.96 U	1 U	0.95 U
1,3-Dichlorobenzene	600	0.96 U	1 U	0.95 U
1,4-Dichlorobenzene	75	0.96 U	1 U	0.95 U
1-Methylnaphthalene	NA	0.96 U	1 U	0.95 U
2,2'-oxybis(1-Chloropropane)	46	1.9 U	2.1 U	1.9 U
2,4,5-Trichlorophenol	NA	4.8 U	5.2 U	4.8 U
2,4,6-Trichlorophenol	NA	4.8 U	5.2 U	4.8 U
2,4-Dichlorophenol	NA	1.9 U	2.1 U	1.9 U
2,4-Dimethylphenol	NA	4.8 U	5.2 U	4.8 U
2,4-Dinitrophenol	NA	4.8 U	5.2 U	4.8 U
2,4-Dinitrotoluene	NA	0.96 U	1 U	0.95 U
2,6-Dinitrotoluene	NA	0.96 U	1 U	0.95 U
2-Chloronaphthalene	NA	1.9 U	2.1 U	1.9 U
2-Chlorophenol	NA	4.8 U	5.2 U	4.8 U
2-Methylnaphthalene	NA	0.96 U	1 U	0.95 U
2-Methylphenol (o-Cresol)	NA	1.9 U	2.1 U	1.9 U
2-Nitroaniline	NA	4.8 U	5.2 U	4.8 U
2-Nitrophenol	NA	4.8 U	5.2 U	4.8 U
3&4-Methylphenol	NA	1.9 U	2.1 U	1.9 U
3,3'-Dichlorobenzidine	NA	1.9 U	2.1 U	1.9 U
3-Nitroaniline	NA	4.8 U	5.2 U	4.8 U
4,6-Dinitro-2-methylphenol	NA	4.8 U	5.2 U	4.8 U
4-Bromophenyl phenyl ether	NA	1.9 U	2.1 U	1.9 U
4-Chloro-3-methylphenol	NA	4.8 U	5.2 U	4.8 U
4-Chloroaniline	NA	4.8 U	5.2 U	4.8 U
4-Chlorophenyl phenyl ether	NA	1.9 U	2.1 U	1.9 U
4-Nitroaniline	NA	4.8 U	5.2 U	4.8 U
4-Nitrophenol	NA	9.6 U	10 U	9.5 U
Acenaphthene	NA	0.96 U	1 U	0.95 U
Acenaphthylene	NA	0.96 U	1 U	0.95 U
Aniline	NA	1.9 U	2.1 U	1.9 U
Anthracene	343	0.96 U	1 U	0.95 U
Benzidine	NA	9.6 UJ	10 UJ	9.5 U
Benzo(a)anthracene	NA	0.96 U	1 U	0.95 U
Benzo(a)pyrene	0.2	**0.96 U**	**1 U**	**0.95 U**
Benzo(b)fluoranthene	NA	0.96 U	1 U	0.95 U
Benzo(g,h,i)perylene	NA	0.96 U	1 U	0.95 U
Benzo(k)fluoranthene	NA	0.96 U	1 U	0.95 U
Benzoic acid	NA	19 U	21 U	19 U
Benzyl Alcohol	NA	1.9 U	2.1 U	1.9 U
bis(2-Chloroethoxy)methane	NA	1.9 U	2.1 U	1.9 U
bis(2-Chloroethyl)ether	NA	1.9 U	2.1 U	1.9 U
bis(2-Ethylhexyl)phthalate	6	1.9 U	2.1 U	1.9 U
Butyl benzylphthalate	NA	1.9 U	2.1 U	1.9 U
Carbazole	NA	0.96 U	1 U	0.95 U
Chrysene	NA	0.96 U	1 U	0.95 U
Dibenz(a,h)anthracene	NA	0.96 U	1 U	0.95 U
Dibenzofuran	NA	4.8 U	5.2 U	4.8 U
Diethyl phthalate	NA	1.9 U	0.33 J	1.9 U
Dimethyl phthalate	NA	1.9 U	2.1 U	1.9 U
Di-n-butylphthalate	NA	1.9 U	2.1 U	1.9 U
Di-n-octyl phthalate	NA	1.9 U	2.1 U	1.9 U
Fluoranthene	46	0.96 U	1 U	0.26 J
Fluorene	46	0.96 U	0.32 J	0.95 U
Hexachlorobenzene	1	0.96 U	1 U	0.95 U
Hexachlorobutadiene	NA	0.96 U	1 U	0.95 U
Hexachlorocyclopentadiene	50	9.6 U	10 U	9.5 U
Hexachloroethane	NA	1.9 U	2.1 U	1.9 U
Indeno(1,2,3-cd)pyrene	NA	0.96 U	1 U	0.95 U
Isophorone	NA	1.9 U	2.1 U	1.9 U
Naphthalene	0.5	**0.96 U**	**1 U**	**0.95 U**
Nitrobenzene	NA	1.9 U	2.1 U	1.9 U
N-Nitrosodimethylamine	NA	1.9 U	2.1 U	1.9 U
N-Nitrosodi-n-propylamine	NA	1.9 U	2.1 U	1.9 U
N-Nitrosodiphenylamine	NA	4.8 U	5.2 U	4.8 U
Pentachlorophenol	1	**3.8 U**	**4.1 U**	**3.8 U**
Phenanthrene	NA	0.96 U	1 U	1.1
Phenol	NA	1.9 U	2.1 U	1.9 U
Pyrene	NA	0.96 U	1 U	0.23 J
Pyridine	NA	1.9 U	2.1 U	1.9 U

TABLE 5.12-2
AOC 12 - FORMER EDSON'S GULF STATION AND GARAGE: GROUNDWATER ANALYTICAL RESULTS COMPARED TO GROUNDWATER ENFORCEMENT STANDARDS
VERMONT YANKEE
VERNON, VERMONT

Location Name Sample Name Sample Date Lab Sample ID	VT ANR Proposed 2019 Groundwater Enforcement	DP1201 GW1201-20190509 05/09/2019 JC87972-2	DP1202 GW1202-20190509 05/09/2019 JC87972-3	DP1209 GW1209-20190426 04/26/2019 JC87127-6
Total Petroleum Hydrocarbons (ug/L)				
Total Petroleum Hydrocarbons (C10-C28) DRO	NA	83 U	83 U	83 U
Total Petroleum Hydrocarbons (C6-C10) GRO	NA	200 U	200 U	200 U
Inorganic Compounds (ug/L)				
Aluminum, Total	NA	230000	539000	6430
Antimony, Total	NA	60 U	300 U	6 U
Arsenic, Total	10	**125**	**635**	9.3
Barium, Total	2000	**2170**	**10000 U**	200 U
Beryllium, Total	4	**10**	**50 U**	1 U
Cadmium, Total	5	**30 U**	**150 U**	3 U
Calcium, Total	NA	69500	250000 U	25800
Chromium, Total	100	**467**	**1670**	34.2
Cobalt, Total	NA	500 U	2500 U	50 U
Copper, Total	1300	493	**1770**	26
Iron, Total	NA	383000	1590000	13800
Lead, Total	15	**250**	**530**	8
Magnesium, Total	NA	84700	250000 U	6710
Manganese, Total	300	**31800**	**105000**	**3480**
Mercury, Total	NA	5.9	2	0.2 U
Nickel, Total	100	**656**	**1990**	63
Potassium, Total	NA	100000 U	500000 U	10000 U
Selenium, Total	50	**100 U**	**500 U**	10 U
Silver, Total	NA	100 U	500 U	10 U
Sodium, Total	NA	100000 U	500000 U	98200
Thallium, Total	2	**100 U**	**500 U**	**10 U**
Vanadium, Total	NA	500 U	2500 U	50 U
Zinc, Total	NA	923	2480	54
PCBs (ug/L)				
Aroclor-1016 (PCB-1016)	NA	-	-	0.33 U
Aroclor-1221 (PCB-1221)	NA	-	-	0.33 U
Aroclor-1232 (PCB-1232)	NA	-	-	0.33 U
Aroclor-1242 (PCB-1242)	NA	-	-	0.33 U
Aroclor-1248 (PCB-1248)	NA	-	-	0.33 U
Aroclor-1254 (PCB-1254)	NA	-	-	0.33 U
Aroclor-1260 (PCB-1260)	NA	-	-	0.33 U
Aroclor-1262 (PCB-1262)	NA	-	-	0.33 U
Aroclor-1268 (PCB-1268)	NA	-	-	0.33 U
SUM of PCBs		-	-	ND

ABBREVIATIONS AND NOTES:
-: Not Analyzed
J: valued is estimated
J+: valued is estimated with a potential high bias
mS/cm: milliSiemen per centimeter
mv: millivolt
NA: Not Applicable
NTU: Nephelometric Turbidiy Units
RSL: Risk-Based Screening Levels
U: Not detected, value is the laboratory reporting limit
ug/L: microgram per liter
USEPA: United States Environmental Protection Agency
VT ANR: Vermont Agency of Natural Resources

- Volatile and Semi-Volatile analytes detected in at least one sample are reported herein.
  For a complete list of analytes see the laboratory data sheets.
- Bold values indicate an exceedance of the VT ANR Proposed 2019 Groundwater
  Enforcement Standard.

TABLE 5.13-1
AOC 13 - SEPTIC SYSTEMS AND APPLICATION AREAS: SOIL ANALYTICAL RESULTS COMPARED TO RESIDENTIAL AND NON-RESIDENTIAL SOIL CRITERIA
VERMONT YANKEE
VERNON, VERMONT

Location Name Sample Name Sample Date Lab Sample ID Sample Depth (bgs)	VT ANR 2019 Proposed Residential Soil	VT ANR 2019 Proposed Non-Residential Soil	USEPA RSL Residential Soil HI = 1.0 May 2019	USEPA RSL Industrial Soil HI = 1.0 May 2019	DP1301 DP130101 04/30/2019 JC87266-9 0 - 1 (ft)	DP1301 DP130105 04/30/2019 JC87266-8 5 - 7 (ft)	DP1302 DP130201 04/30/2019 JC87266-11 0 - 1 (ft)	DP1302 DP130212 04/30/2019 JC87266-10 12 - 14 (ft)	DP1303 DP130301 05/01/2019 JC87364-9 0 - 1 (ft)	DP1303 DP130318 05/01/2019 JC87364-10 18 - 20 (ft)	DP1304 DP130401 05/01/2019 JC87364-11 0 - 1 (ft)	DP1304 DP130419 05/01/2019 JC87364-12 19 - 20 (ft)	DP1305 DP130501 05/01/2019 JC87364-6 0 - 1 (ft)	DP1305 DP130510 05/01/2019 JC87364-5 10 - 12 (ft)	DP1306 DP130601 04/30/2019 JC87364-2 0 - 1 (ft)	DP1306 DP130606 04/30/2019 JC87364-1 6 - 8 (ft)	DP1307 DP130701 04/30/2019 JC87266-6 0 - 1 (ft)	DP1307 DP130701DUP 04/30/2019 JC87266-7 0 - 1 (ft)	DP1307 DP130706 04/30/2019 JC87266-5 6 - 8 (ft)	DP1308 DP130801 04/30/2019 JC87266-18 0 - 1 (ft)	DP1308 DP130806 04/30/2019 JC87266-17 6 - 8 (ft)	DP1309 DP130901 04/29/2019 JC87184-1 0 - 1 (ft)	DP1309 DP130912 04/29/2019 JC87184-2 12 - 14 (ft)	DP1310 DP131001 04/29/2019 JC87184-5 0 - 1 (ft)	DP1310 DP131008 04/29/2019 JC87184-6 8 - 10 (ft)	DP1311 DP131101 04/29/2019 JC87184-3 0 - 1 (ft)	DP1311 DP131106 04/29/2019 JC87184-4 6 - 8 (ft)	SP1301 SP130100 05/16/2019 JC88412-1 0 - 0.5 (ft)	SP1302 SP130200 05/16/2019 JC88412-2 0 - 0.5 (ft)
Volatile Organic Compounds (mg/kg)																													
1,1,1,2-Tetrachloroethane	1.3	8	2	8.8	0.0022 U	0.0022 U	0.0035 U	0.0022 U	0.002 U	0.0024 U	0.0021 U	0.0023 U	0.0021 U	0.002 U	0.0028 U	0.0027 U	0.0025 U	0.002 U	0.0021 U	0.0027 U	0.0022 U	0.0026 U	0.002 U	0.0042 U	0.0019 U	0.0039 U	0.0019 U	0.0019 U	0.0023 U
1,1,1-Trichloroethane	NA	NA	8100	36000	0.0022 U	0.0022 U	0.0035 U	0.0022 U	0.002 U	0.0024 U	0.0021 U	0.0023 U	0.0021 U	0.002 U	0.0028 U	0.0027 U	0.0025 U	0.002 U	0.0021 U	0.0027 U	0.0022 U	0.0026 U	0.002 U	0.0042 U	0.0019 U	0.0039 U	0.0019 U	0.0019 U	0.0023 U
1,1,2,2-Tetrachloroethane	NA	NA	0.6	2.7	0.0022 U	0.0022 U	0.0035 U	0.0022 U	0.002 U	0.0024 U	0.0021 U	0.0023 U	0.0021 U	0.002 U	0.0028 U	0.0027 U	0.0025 U	0.002 U	0.0021 U	0.0027 U	0.0022 U	0.0026 U	0.002 U	0.0042 U	0.0019 U	0.0039 U	0.0019 U	0.0019 U	0.0023 U
1,1,2-Trichloroethane	NA	NA	1.1	5	0.0022 U	0.0022 U	0.0035 U	0.0022 U	0.002 U	0.0024 U	0.0021 U	0.0023 U	0.0021 U	0.002 U	0.0028 U	0.0027 U	0.0025 U	0.002 U	0.0021 U	0.0027 U	0.0022 U	0.0026 U	0.002 U	0.0042 U	0.0019 U	0.0039 U	0.0019 U	0.0019 U	0.0023 U
1,1-Dichloroethane	2.1	13	3.6	16	0.0011 U	0.0011 U	0.0017 U	0.0011 U	0.001 U	0.0012 U	0.001 U	0.0011 U	0.001 U	0.00099 U	0.0014 U	0.0014 U	0.0013 U	0.00099 U	0.001 U	0.0013 U	0.0011 U	0.0013 U	0.001 U	0.0021 U	0.00095 U	0.002 U	0.00095 U	0.00097 U	0.0011 U
1,1-Dichloroethene	NA	NA	230	1000	0.0011 U	0.0011 U	0.0017 U	0.0011 U	0.001 U	0.0012 U	0.001 U	0.0011 U	0.001 U	0.00099 U	0.0014 U	0.0014 U	0.0013 U	0.00099 U	0.001 U	0.0013 U	0.0011 U	0.0013 U	0.001 U	0.0021 U	0.00095 U	0.002 U	0.00095 U	0.00097 U	0.0011 U
1,1-Dichloropropene	NA	NA	NA	NA	0.0022 U	0.0022 U	0.0035 U	0.0022 U	0.002 U	0.0024 U	0.0021 U	0.0023 U	0.0021 U	0.002 U	0.0028 U	0.0027 U	0.0025 U	0.002 U	0.0021 U	0.0027 U	0.0022 U	0.0026 U	0.002 U	0.0042 U	0.0019 U	0.0039 U	0.0019 U	0.0019 U	0.0023 U
1,2,3-Trichlorobenzene	NA	NA	63	930	0.0055 U	0.0055 U	0.0087 U	0.0056 U	0.005 U	0.0059 U	0.0052 U	0.0057 U	0.0052 U	0.0049 U	0.007 U	0.0068 U	0.0063 U	0.005 U	0.0051 U	0.0066 U	0.0055 U	0.0064 U	0.0051 U	0.011 U	0.0047 U	0.0098 U	0.0048 U	0.0048 U	0.0057 U
1,2,3-Trichloropropane	0.00311	0.07	0.0051	0.11	**0.0055 U**	**0.0055 U**	**0.0087 U**	**0.0056 U**	**0.005 U**	**0.0059 U**	**0.0052 U**	**0.0057 U**	**0.0052 U**	**0.0049 U**	**0.007 U**	**0.0068 U**	**0.0063 U**	**0.005 U**	**0.0051 U**	**0.0066 U**	**0.0055 U**	**0.0064 U**	**0.0051 U**	**0.011 U**	**0.0047 U**	**0.0098 U**	**0.0048 U**	**0.0048 U**	**0.0057 U**
1,2,4-Trichlorobenzene	NA	NA	24	110	0.0055 U	0.0055 U	0.0087 U	0.0056 U	0.005 U	0.0059 U	0.0052 U	0.0057 U	0.0052 U	0.0049 U	0.007 U	0.0068 U	0.0063 U	0.005 U	0.0051 U	0.0066 U	0.0055 U	0.0064 U	0.0051 U	0.011 U	0.0047 U	0.0098 U	0.0048 U	0.0048 U	0.0057 U
1,2,4-Trimethylbenzene	144	177	300	1800	0.0022 U	0.0022 U	0.0035 U	0.0022 U	0.002 U	0.0024 U	0.0021 U	0.0023 U	0.0021 U	0.002 U	0.0028 U	0.0027 U	0.0025 U	0.002 U	0.0021 U	0.0027 U	0.0022 U	0.0026 U	0.002 U	0.0042 U	0.0019 U	0.0039 U	0.0019 U	0.0019 U	0.0023 U
1,2-Dibromo-3-chloropropane (DBCP)	0.01	0.06	0.0053	0.064	0.0022 U	0.0022 U	0.0035 U	0.0022 U	0.002 U	0.0024 U	0.0021 U	0.0023 U	0.0021 U	0.002 U	0.0028 U	0.0027 U	0.0025 U	0.002 U	0.0021 U	0.0027 U	0.0022 U	0.0026 U	0.002 U	0.0042 U	0.0019 U	0.0039 U	0.0019 U	0.0019 U	0.0023 U
1,2-Dibromoethane (Ethylene Dibromide)	0.02	0.14	0.036	0.16	0.0011 U	0.0011 U	0.0017 U	0.0011 U	0.001 U	0.0012 U	0.001 U	0.0011 U	0.001 U	0.00099 U	0.0014 U	0.0014 U	0.0013 U	0.00099 U	0.001 U	0.0013 U	0.0011 U	0.0013 U	0.001 U	0.0021 U	0.00095 U	0.002 U	0.00095 U	0.00097 U	0.0011 U
1,2-Dichlorobenzene	NA	NA	1800	9300	0.0011 U	0.0011 U	0.0017 U	0.0011 U	0.001 U	0.0012 U	0.001 U	0.0011 U	0.001 U	0.00099 U	0.0014 U	0.0014 U	0.0013 U	0.00099 U	0.001 U	0.0013 U	0.0011 U	0.0013 U	0.001 U	0.0021 U	0.00095 U	0.002 U	0.00095 U	0.00097 U	0.0011 U
1,2-Dichloroethane	0.29	1.7	0.46	2	0.0011 U	0.0011 U	0.0017 U	0.0011 U	0.001 U	0.0012 U	0.001 U	0.0011 U	0.001 U	0.00099 U	0.0014 U	0.0014 U	0.0013 U	0.00099 U	0.001 U	0.0013 U	0.0011 U	0.0013 U	0.001 U	0.0021 U	0.00095 U	0.002 U	0.00095 U	0.00097 U	0.0011 U
1,2-Dichloropropane	1.5	9.1	2.5	11	0.0022 U	0.0022 U	0.0035 U	0.0022 U	0.002 U	0.0024 U	0.0021 U	0.0023 U	0.0021 U	0.002 U	0.0028 U	0.0027 U	0.0025 U	0.002 U	0.0021 U	0.0027 U	0.0022 U	0.0026 U	0.002 U	0.0042 U	0.0019 U	0.0039 U	0.0019 U	0.0019 U	0.0023 U
1,3,5-Trimethylbenzene	144	177	270	1500	0.0022 U	0.0022 U	0.0035 U	0.0022 U	0.002 U	0.0024 U	0.0021 U	0.0023 U	0.0021 U	0.002 U	0.0028 U	0.0027 U	0.0025 U	0.002 U	0.0021 U	0.0027 U	0.0022 U	0.0026 U	0.002 U	0.0042 U	0.0019 U	0.0039 U	0.0019 U	0.0019 U	0.0023 U
1,3-Dichlorobenzene	NA	NA	NA	NA	0.0011 U	0.0011 U	0.0017 U	0.0011 U	0.001 U	0.0012 U	0.001 U	0.0011 U	0.001 U	0.00099 U	0.0014 U	0.0014 U	0.0013 U	0.00099 U	0.001 U	0.0013 U	0.0011 U	0.0013 U	0.001 U	0.0021 U	0.00095 U	0.002 U	0.00095 U	0.00097 U	0.0011 U
1,3-Dichloropropane	NA	NA	1600	23000	0.0022 U	0.0022 U	0.0035 U	0.0022 U	0.002 U	0.0024 U	0.0021 U	0.0023 U	0.0021 U	0.002 U	0.0028 U	0.0027 U	0.0025 U	0.002 U	0.0021 U	0.0027 U	0.0022 U	0.0026 U	0.002 U	0.0042 U	0.0019 U	0.0039 U	0.0019 U	0.0019 U	0.0023 U
1,4-Dichlorobenzene	NA	NA	2.6	11	0.0011 U	0.0011 U	0.0017 U	0.0011 U	0.001 U	0.0012 U	0.001 U	0.0011 U	0.001 U	0.00099 U	0.0014 U	0.0014 U	0.0013 U	0.00099 U	0.001 U	0.0013 U	0.0011 U	0.0013 U	0.001 U	0.0021 U	0.00095 U	0.002 U	0.00095 U	0.00097 U	0.0011 U
2,2-Dichloropropane	NA	NA	NA	NA	0.0022 U	0.0022 U	0.0035 U	0.0022 U	0.002 U	0.0024 U	0.0021 U	0.0023 U	0.0021 U	0.002 U	0.0028 U	0.0027 U	0.0025 U	0.002 U	0.0021 U	0.0027 U	0.0022 U	0.0026 U	0.002 U	0.0042 U	0.0019 U	0.0039 U	0.0019 U	0.0019 U	0.0023 U
2-Butanone (Methyl Ethyl Ketone)	16952	26991	27000	190000	0.011 U	0.011 U	0.017 U	0.011 U	0.0164	0.012 U	0.01 U	0.011 U	0.01 U	0.0099 U	0.014 U	0.014 U	0.013 U	0.0099 U	0.01 U	0.013 U	0.0077 J	0.013 U	0.01 U	0.021 U	0.0095 U	0.02 U	0.0095 U	0.0097 U	0.011 U
2-Chlorotoluene	NA	NA	1600	23000	0.0022 U	0.0022 U	0.0035 U	0.0022 U	0.002 U	0.0024 U	0.0021 U	0.0023 U	0.0021 U	0.002 U	0.0028 U	0.0027 U	0.0025 U	0.002 U	0.0021 U	0.0027 U	0.0022 U	0.0026 U	0.002 U	0.0042 U	0.0019 U	0.0039 U	0.0019 U	0.0019 U	0.0023 U
2-Phenylbutane (sec-Butylbenzene)	7009	102200	7800	120000	0.0022 U	0.0022 U	0.0035 U	0.0022 U	0.002 U	0.0024 U	0.0021 U	0.0023 U	0.0021 U	0.002 U	0.0028 U	0.0027 U	0.0025 U	0.002 U	0.0021 U	0.0027 U	0.0022 U	0.0026 U	0.002 U	0.0042 U	0.0019 U	0.0039 U	0.0019 U	0.0019 U	0.0023 U
4-Chlorotoluene	NA	NA	1600	23000	0.0022 U	0.0022 U	0.0035 U	0.0022 U	0.002 U	0.0024 U	0.0021 U	0.0023 U	0.0021 U	0.002 U	0.0028 U	0.0027 U	0.0025 U	0.002 U	0.0021 U	0.0027 U	0.0022 U	0.0026 U	0.002 U	0.0042 U	0.0019 U	0.0039 U	0.0019 U	0.0019 U	0.0023 U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	NA	NA	33000	140000	0.0055 U	0.0055 U	0.0087 U	0.0056 U	0.005 U	0.0059 U	0.0052 U	0.0057 U	0.0052 U	0.0049 U	0.007 U	0.0068 U	0.0063 U	0.005 U	0.0051 U	0.0066 U	0.0055 U	0.0064 U	0.0051 U	0.011 U	0.0047 U	0.0098 U	0.0048 U	0.0048 U	0.0057 U
Acetone	40609	100028	61000	670000	0.019 U	0.0118 U	0.017 U	0.0184 U	0.0636 J+	0.012 UJ	0.0162 UJ	0.0159 UJ	0.0177 UJ	0.0125 UJ	0.0421 J+	0.0281 UJ	0.013 U	0.0251 U	0.0418 J+	0.036 J+	0.0643 J+	0.0202 U	0.0118 U	0.037 U	0.0095 U	0.134 J+	0.0133 U	0.0097 U	0.0241 U
Benzene	0.7	4.2	1.2	5.1	0.00055 U	0.00055 U	0.00087 U	0.00056 U	0.0005 U	0.00059 U	0.00052 U	0.00057 U	0.00052 U	0.00049 U	0.0007 U	0.00068 U	0.00063 U	0.0005 U	0.00051 U	0.00066 U	0.00055 U	0.00064 U	0.00051 U	0.0011 U	0.00047 U	0.00098 U	0.00048 U	0.00048 U	0.00057 U
Bromobenzene	NA	NA	290	1800	0.0055 U	0.0055 U	0.0087 U	0.0056 U	0.005 U	0.0059 U	0.0052 U	0.0057 U	0.0052 U	0.0049 U	0.007 U	0.0068 U	0.0063 U	0.005 U	0.0051 U	0.0066 U	0.0055 U	0.0064 U	0.0051 U	0.011 U	0.0047 U	0.0098 U	0.0048 U	0.0048 U	0.0057 U
Bromodichloromethane	NA	NA	0.29	1.3	0.0022 U	0.0022 U	0.0035 U	0.0022 U	0.002 U	0.0024 U	0.0021 U	0.0023 U	0.0021 U	0.002 U	0.0028 U	0.0027 U	0.0025 U	0.002 U	0.0021 U	0.0027 U	0.0022 U	0.0026 U	0.002 U	0.0042 U	0.0019 U	0.0039 U	0.0019 U	0.0019 U	0.0023 U
Bromoform	NA	NA	19	86	0.0055 U	0.0055 U	0.0087 U	0.0056 U	0.005 U	0.0059 U	0.0052 U	0.0057 U	0.0052 U	0.0049 U	0.007 U	0.0068 U	0.0063 U	0.005 U	0.0051 U	0.0066 U	0.0055 U	0.0064 U	0.0051 U	0.011 U	0.0047 U	0.0098 U	0.0048 U	0.0048 U	0.0057 U
Bromomethane (Methyl Bromide)	NA	NA	6.8	30	0.0055 U	0.0055 U	0.0087 U	0.0056 U	0.005 U	0.0059 U	0.0052 U	0.0057 U	0.0052 U	0.0049 U	0.007 U	0.0068 U	0.0063 U	0.005 U	0.0051 U	0.0066 U	0.0055 U	0.0064 U	0.0051 U	0.011 U	0.0047 U	0.0098 U	0.0048 U	0.0048 U	0.0057 U
Carbon tetrachloride	0.37	2.2	0.65	2.9	0.0022 U	0.0022 U	0.0035 U	0.0022 U	0.002 U	0.0024 U	0.0021 U	0.0023 U	0.0021 U	0.002 U	0.0028 U	0.0027 U	0.0025 U	0.002 U	0.0021 U	0.0027 U	0.0022 U	0.0026 U	0.002 U	0.0042 U	0.0019 U	0.0039 U	0.0019 U	0.0019 U	0.0023 U
Chlorobenzene	414	726	280	1300	0.0022 U	0.0022 U	0.0035 U	0.0022 U	0.002 U	0.0024 U	0.0021 U	0.0023 U	0.0021 U	0.002 U	0.0028 U	0.0027 U	0.0025 U	0.002 U	0.0021 U	0.0027 U	0.0022 U	0.0026 U	0.002 U	0.0042 U	0.0019 U	0.0039 U	0.0019 U	0.0019 U	0.0023 U
Chlorobromomethane	193	597	150	630	0.0055 U	0.0055 U	0.0087 U	0.0056 U	0.005 U	0.0059 U	0.0052 U	0.0057 U	0.0052 U	0.0049 U	0.007 U	0.0068 U	0.0063 U	0.005 U	0.0051 U	0.0066 U	0.0055 U	0.0064 U	0.0051 U	0.011 U	0.0047 U	0.0098 U	0.0048 U	0.0048 U	0.0057 U
Chloroethane	NA	NA	14000	57000	0.0055 U	0.0055 U	0.0087 U	0.0056 U	0.005 U	0.0059 U	0.0052 U	0.0057 U	0.0052 U	0.0049 U	0.007 U	0.0068 U	0.0063 U	0.005 U	0.0051 U	0.0066 U	0.0055 U	0.0064 U	0.0051 U	0.011 U	0.0047 U	0.0098 U	0.0048 U	0.0048 U	0.0057 U
Chloroform (Trichloromethane)	NA	NA	0.32	1.4	0.0022 U	0.0022 U	0.0035 U	0.0022 U	0.002 U	0.0024 U	0.0021 U	0.0023 U	0.0021 U	0.002 U	0.0028 U	0.0027 U	0.0025 U	0.002 U	0.0021 U	0.0027 U	0.0022 U	0.0026 U	0.002 U	0.0042 U	0.0019 U	0.0039 U	0.0019 U	0.0019 U	0.0023 U
Chloromethane (Methyl Chloride)	NA	NA	110	460	0.0055 U	0.0055 U	0.0087 U	0.0056 U	0.005 U	0.0059 U	0.0052 U	0.0057 U	0.0052 U	0.0049 U	0.007 U	0.0068 U	0.0063 U	0.005 U	0.0051 U	0.0066 U	0.0055 U	0.0064 U	0.0051 U	0.011 U	0.0047 U	0.0098 U	0.0048 U	0.0048 U	0.0057 U
cis-1,2-Dichloroethene	140	1814	160	2300	0.0011 U	0.0011 U	0.0017 U	0.0011 U	0.001 U	0.0012 U	0.001 U	0.0011 U	0.001 U	0.00099 U	0.0014 U	0.0014 U	0.0013 U	0.00099 U	0.001 U	0.0013 U	0.0011 U	0.0013 U	0.001 U	0.0021 U	0.00095 U	0.002 U	0.00095 U	0.00097 U	0.0011 U
cis-1,3-Dichloropropene	NA	NA	NA	NA	0.0022 U	0.0022 U	0.0035 U	0.0022 U	0.002 U	0.0024 U	0.0021 U	0.0023 U	0.0021 U	0.002 U	0.0028 U	0.0027 U	0.0025 U	0.002 U	0.0021 U	0.0027 U	0.0022 U	0.0026 U	0.002 U	0.0042 U	0.0019 U	0.0039 U	0.0019 U	0.0019 U	0.0023 U
Cymene (p-Isopropyltoluene)	NA	NA	NA	NA	0.0022 U	0.0022 U	0.0035 U	0.0022 U	0.002 U	0.0024 U	0.0021 U	0.0023 U	0.0021 U	0.002 U	0.0028 U	0.0027 U	0.0025 U	0.002 U	0.0021 U	0.0027 U	0.0022 U	0.0026 U	0.002 U	0.0042 U	0.0019 U	0.0039 U	0.0019 U	0.0019 U	0.0023 U
Dibromochloromethane	NA	NA	8.3	39	0.0022 U	0.0022 U	0.0035 U	0.0022 U	0.002 U	0.0024 U	0.0021 U	0.0023 U	0.0021 U	0.002 U	0.0028 U	0.0027 U	0.0025 U	0.002 U	0.0021 U	0.0027 U	0.0022 U	0.0026 U	0.002 U	0.0042 U	0.0019 U	0.0039 U	0.0019 U	0.0019 U	0.0023 U
Dibromomethane	NA	NA	24	99	0.0055 U	0.0055 U	0.0087 U	0.0056 U	0.005 U	0.0059 U	0.0052 U	0.0057 U	0.0052 U	0.0049 U	0.007 U	0.0068 U	0.0063 U	0.005 U	0.0051 U	0.0066 U	0.0055 U	0.0064 U	0.0051 U	0.011 U	0.0047 U	0.0098 U	0.0048 U	0.0048 U	0.0057 U
Dichlorodifluoromethane (CFC-12)	NA	NA	87	370	0.0055 U	0.0055 U	0.0087 U	0.0056 U	0.005 U	0.0059 U	0.0052 U	0.0057 U	0.0052 U	0.0049 U	0.007 U	0.0068 U	0.0063 U	0.005 U	0.0051 U	0.0066 U	0.0055 U	0.0064 U	0.0051 U	0.011 U	0.0047 U	0.0098 U	0.0048 U	0.0048 U	0.0057 U
Ethylbenzene	3.7	22	5.8	25	0.0011 U	0.0011 U	0.0017 U	0.0011 U	0.001 U	0.0012 U	0.001 U	0.0011 U	0.001 U	0.00099 U	0.0014 U	0.0014 U	0.0013 U	0.00099 U	0.001 U	0.0013 U	0.0011 U	0.0013 U	0.001 U	0.0021 U	0.00095 U	0.002 U	0.00095 U	0.00097 U	0.0011 U
Hexachlorobutadiene	NA	NA	1.2	5.3	0.0055 U	0.0055 U	0.0087 U	0.0056 U	0.005 U	0.0059 U	0.0052 U	0.0057 U	0.0052 U	0.0049 U	0.007 U	0.0068 U	0.0063 U	0.005 U	0.0051 U	0.0066 U	0.0055 U	0.0064 U	0.0051 U	0.011 U	0.0047 U	0.0098 U	0.0048 U	0.0048 U	0.0057 U
Isopropylbenzene (Cumene)	256	264	1900	9900	0.0022 U	0.0022 U	0.0035 U	0.0022 U	0.002 U	0.0024 U	0.0021 U	0.0023 U	0.0021 U	0.002 U	0.0028 U	0.0027 U	0.0025 U	0.002 U	0.0021 U	0.0027 U	0.0022 U	0.0026 U	0.002 U	0.0042 U	0.0019 U	0.0039 U	0.0019 U	0.0019 U	0.0023 U
m,p-Xylenes	NA	NA	NA	NA	0.0011 U	0.0011 U	0.0017 U	0.0011 U	0.001 U	0.0012 U	0.001 U	0.0011 U	0.001 U	0.00099 U	0.0014 U	0.0014 U	0.0013 U	0.00099 U	0.001 U	0.0013 U	0.0011 U	0.0013 U	0.001 U	0.0021 U	0.00095 U	0.002 U	0.00095 U	0.00097 U	0.0011 U
Methyl Tert Butyl Ether	649	4464	47	210	0.0011 U	0.0011 U	0.0017 U	0.0011 U	0.001 U	0.0012 U	0.001 U	0.0011 U	0.001 U	0.00099 U	0.0014 U	0.0014 U	0.0013 U	0.00099 U	0.001 U	0.0013 U	0.0011 U	0.0013 U	0.001 U	0.0021 U	0.00095 U	0.002 U	0.00095 U	0.00097 U	0.0011 U
Methylene chloride	NA	NA	57	1000	0.0055 U	0.0055 U	0.0087 U	0.003 J	0.005 U	0.0059 U	0.0052 U	0.0057 U	0.0052 U	0.0049 U	0.007 U	0.0068 U	0.0063 U	0.005 U	0.0051 U	0.0066 U	0.0055 U	0.0064 U	0.0051 U	0.011 U	0.0047 U	0.0098 U	0.0048 U	0.0048 U	0.0057 U
Naphthalene	2.7	16	3.8	17	0.0055 U	0.0055 U	0.0087 U	0.0056 U	0.005 U	0.0059 U	0.0052 U	0.0057 U	0.0052 U	0.0049 U	0.007 U	0.0068 U	0.0063 U	0.005 U	0.0051 U	0.0066 U	0.0055 U	0.0064 U	0.0051 U	0.011 U	0.0047 U	0.0098 U	0.0048 U	0.0048 U	0.0057 U
n-Butylbenzene	3504	51100	3900	58000	0.0022 U	0.0022 U	0.0035 U	0.0022 U	0.002 U	0.0024 U	0.0021 U	0.0023 U	0.0021 U	0.002 U	0.0028 U	0.0027 U	0.0025 U	0.002 U	0.0021 U	0.0027 U	0.0022 U	0.0026 U	0.002 U	0.0042 U	0.0019 U	0.0039 U	0.0019 U	0.0019 U	0.0023 U
n-Propylbenzene	253	261	3800	24000	0.0022 U	0.0022 U	0.0035 U	0.0022 U	0.002 U	0.0024 U	0.0021 U	0.0023 U	0.0021 U	0.002 U	0.0028 U	0.0027 U	0.0025 U	0.002 U	0.0021 U	0.0027 U	0.0022 U	0.0026 U	0.002 U	0.0042 U	0.0019 U	0.0039 U	0.0019 U	0.0019 U	0.0023 U
o-Xylene	NA	NA	650	2800	0.0011 U	0.0011 U	0.0017 U	0.0011 U	0.001 U	0.0012 U	0.001 U	0.0011 U	0.001 U	0.00099 U	0.0014 U	0.0014 U	0.0013 U	0.00099 U	0.001 U	0.0013 U	0.0011 U	0.0013 U	0.001 U	0.0021 U	0.00095 U	0.002 U	0.00095 U	0.00097 U	0.0011 U
Styrene	NA	NA	6000	35000	0.0022 U	0.0022 U	0.0035 U	0.0022 U	0.002 U	0.0024 U	0.0021 U	0.0023 U	0.0021 U	0.002 U	0.0028 U	0.0027 U	0.0025 U	0.002 U	0.0021 U	0.0027 U	0.0022 U	0.0026 U	0.002 U	0.0042 U	0.0019 U	0.0039 U	0.0019 U	0.0019 U	0.0023 U
tert-Butylbenzene	7009	102200	7800	120000	0.0022 U	0.0022 U	0.0035 U	0.0022 U	0.002 U	0.0024 U	0.0021 U	0.0023 U	0.0021 U	0.002 U	0.0028 U	0.0027 U	0.0025 U	0.002 U	0.0021 U	0.0027 U	0.0022 U	0.0026 U	0.002 U	0.0042 U	0.0019 U	0.0039 U	0.0019 U	0.0019 U	0.0023 U
Tetrachloroethene	2.4	14	24	100	0.0022 U	0.0022 U	0.0035 U	0.0022 U	0.002 U	0.0024 U	0.0021 U	0.0023 U	0.0021 U	0.002 U	0.0028 U	0.0027 U	0.0025 U	0.002 U	0.0021 U	0.0027 U	0.0022 U	0.0026 U	0.002 U	0.0042 U	0.0019 U	0.0039 U	0.0019 U	0.0019 U	0.0023 U
Toluene	706	798	4900	47000	0.0011 U	0.0011 U	0.0017 U	0.00091 J	0.001 U	0.0012 U	0.001 U	0.0011 U	0.001 U	0.00099 U	0.0014 U	0.0014 U	0.0013 U	0.00099 U	0.001 U	0.0013 U	0.0011 U	0.0013 U	0.001 U	0.0021 U	0.00095 U	0.002 U	0.00095 U	0.00097 U	0.0011 U
trans-1,2-Dichloroethene	1402	18137	1600	23000	0.0011 U	0.0011 U	0.0017 U	0.0011 U	0.001 U	0.0012 U	0.001 U	0.0011 U	0.001 U	0.00099 U	0.0014 U	0.0014 U	0.0013 U	0.00099 U	0.001 U	0.0013 U	0.0011 U	0.0013 U	0.001 U	0.0021 U	0.00095 U	0.002 U	0.00095 U	0.00097 U	0.0011 U
trans-1,3-Dichloropropene	NA	NA	NA	NA	0.0022 U	0.0022 U	0.0035 U	0.0022 U	0.002 U	0.0024 U	0.0021 U	0.0023 U	0.0021 U	0.002 U	0.0028 U	0.0027 U	0.0025 U	0.002 U	0.0021 U	0.0027 U	0.0022 U	0.0026 U	0.002 U	0.0042 U	0.0019 U	0.0039 U	0.0019 U	0.0019 U	0.0023 U
Trichloroethene	0.68	6.5	0.94	6	0.0011 U	0.0011 U	0.0017 U	0.0011 U	0.001 U	0.0012 U	0.001 U	0.0011 U	0.001 U	0.00099 U	0.0014 U	0.0014 U	0.0013 U	0.00099 U	0.001 U	0.0013 U	0.0011 U	0.0013 U	0.001 U	0.0021 U	0.00095 U	0.002 U	0.00095 U	0.00097 U	0.0011 U
Trichlorofluoromethane (CFC-11)	NA	NA	23000	350000	0.0055 U	0.0055 U	0.0087 U	0.0056 U	0.005 U	0.0059 U	0.0052 U	0.0057 U	0.0052 U	0.0049 U	0.007 U	0.0068 U	0.0063 U	0.005 U	0.0051 U	0.0066 U	0.0055 U	0.0064 U	0.0051 U	0.011 U	0.0047 U	0.0098 U	0.0048 U	0.0048 U	0.0057 U
Vinyl chloride	0.1	0.59	0.059	1.7	0.0022 U	0.0022 U	0.0035 U	0.0022 U	0.002 U	0.0024 U	0.0021 U	0.0023 U	0.0021 U	0.002 U	0.0028 U	0.0027 U	0.0025 U	0.002 U	0.0021 U	0.0027 U	0.0022 U	0.0026 U	0.002 U	0.0042 U	0.0019 U	0.0039 U	0.0019 U	0.0019 U	0.0023 U
Xylene (total)	252	257	580	2500	0.0011 U	0.0011 U	0.0017 U	0.0011 U	0.001 U	0.0012 U	0.001 U	0.0011 U	0.001 U	0.00099 U	0.0014 U	0.0014 U	0.0013 U	0.00099 U	0.001 U	0.0013 U	0.0011 U	0.0013 U	0.001 U	0.0021 U	0.00095 U	0.002 U	0.00095 U	0.00097 U	0.0011 U

TABLE 5.13-1
AOC 13 - SEPTIC SYSTEMS AND APPLICATION AREAS: SOIL ANALYTICAL RESULTS COMPARED TO RESIDENTIAL AND NON-RESIDENTIAL SOIL CRITERIA
VERMONT YANKEE
VERNON, VERMONT

Location Name	VT ANR 2019 Proposed Residential Soil	VT ANR 2019 Proposed Non-Residential Soil	USEPA RSL Residential Soil HI = 1.0 May 2019	USEPA RSL Industrial Soil HI = 1.0 May 2019	DP1301	DP1301	DP1302	DP1302	DP1303	DP1303	DP1304	DP1304	DP1305	DP1305	DP1306	DP1306	DP1307	DP1307	DP1307	DP1308	DP1308	DP1309	DP1309	DP1310	DP1310	DP1311	DP1311	SP1301	SP1302
Sample Name					DP130101	DP130105	DP130201	DP130212	DP130301	DP130318	DP130401	DP130419	DP130501	DP130510	DP130601	DP130606	DP130701	DP130701DUP	DP130706	DP130801	DP130806	DP130901	DP130912	DP131001	DP131008	DP131101	DP131106	SP130100	SP130200
Sample Date					04/30/2019	04/30/2019	04/30/2019	04/30/2019	05/01/2019	05/01/2019	05/01/2019	05/01/2019	05/01/2019	05/01/2019	04/30/2019	04/30/2019	04/30/2019	04/30/2019	04/30/2019	04/30/2019	04/30/2019	04/29/2019	04/29/2019	04/29/2019	04/29/2019	04/29/2019	04/29/2019	05/16/2019	05/16/2019
Lab Sample ID					JC87266-9	JC87266-8	JC87266-11	JC87266-10	JC87364-9	JC87364-10	JC87364-11	JC87364-12	JC87364-6	JC87364-5	JC87364-2	JC87364-1	JC87266-6	JC87266-7	JC87266-5	JC87266-18	JC87266-17	JC87184-1	JC87184-2	JC87184-5	JC87184-6	JC87184-3	JC87184-4	JC88412-1	JC88412-2
Sample Depth (bgs)					0 - 1 (ft)	5 - 7 (ft)	0 - 1 (ft)	12 - 14 (ft)	0 - 1 (ft)	18 - 20 (ft)	0 - 1 (ft)	19 - 20 (ft)	0 - 1 (ft)	10 - 12 (ft)	0 - 1 (ft)	6 - 8 (ft)	0 - 1 (ft)	0 - 1 (ft)	6 - 8 (ft)	0 - 1 (ft)	6 - 8 (ft)	0 - 1 (ft)	12 - 14 (ft)	0 - 1 (ft)	8 - 10 (ft)	0 - 1 (ft)	6 - 8 (ft)	0 - 0.5 (ft)	0 - 0.5 (ft)
Semi-Volatile Organic Compounds (mg/kg)																													
1,2,4-Trichlorobenzene	NA	NA	24	110	0.081 U	0.075 U	0.086 U	0.077 U	0.074 U	0.069 U	0.077 U	0.068 U	0.076 U	0.083 U	0.08 U	0.078 U	0.07 U	0.074 U	0.078 U	0.077 U	0.079 U	0.077 U	0.071 U	0.082 U	0.07 U	0.085 U	0.081 U	0.073 U	0.071 U
1,2-Dichlorobenzene	NA	NA	1800	9300	0.081 U	0.075 U	0.086 U	0.077 U	0.074 U	0.069 U	0.077 U	0.068 U	0.076 U	0.083 U	0.08 U	0.078 U	0.07 U	0.074 U	0.078 U	0.077 U	0.079 U	0.077 U	0.071 U	0.082 U	0.07 U	0.085 U	0.081 U	0.073 U	0.071 U
1,2-Diphenylhydrazine	NA	NA	0.68	2.9	0.081 U	0.075 U	0.086 UJ	0.077 UJ	0.074 U	0.069 U	0.077 U	0.068 U	0.076 U	0.083 U	0.08 U	0.078 U	0.07 U	0.074 U	0.078 U	0.077 UJ	0.079 UJ	0.077 U	0.071 U	0.082 U	0.07 U	0.085 U	0.081 U	0.073 U	0.071 U
1,3-Dichlorobenzene	NA	NA	NA	NA	0.081 U	0.075 U	0.086 U	0.077 U	0.074 U	0.069 U	0.077 U	0.068 U	0.076 U	0.083 U	0.08 U	0.078 U	0.07 U	0.074 U	0.078 U	0.077 U	0.079 U	0.077 U	0.071 U	0.082 U	0.07 U	0.085 U	0.081 U	0.073 U	0.071 U
1,4-Dichlorobenzene	NA	NA	2.6	11	0.081 U	0.075 U	0.086 U	0.077 U	0.074 U	0.069 U	0.077 U	0.068 U	0.076 U	0.083 U	0.08 U	0.078 U	0.07 U	0.074 U	0.078 U	0.077 U	0.079 U	0.077 U	0.071 U	0.082 U	0.07 U	0.085 U	0.081 U	0.073 U	0.071 U
1-Methylnaphthalene	NA	NA	18	73	0.04 U	0.038 U	0.043 U	0.039 U	0.037 U	0.034 U	0.038 U	0.034 U	0.038 U	0.042 UJ	0.04 U	0.039 U	0.035 U	0.037 U	0.039 U	0.038 U	0.039 U	0.038 U	0.036 U	0.041 U	0.035 U	0.043 U	0.04 U	0.036 U	0.035 UJ
2,2'-oxybis(1-Chloropropane)	2804	36274	3100	47000	0.081 U	0.075 U	0.086 U	0.077 U	0.074 U	0.069 U	0.077 U	0.068 U	0.076 U	0.083 U	0.08 U	0.078 U	0.07 U	0.074 U	0.078 U	0.077 U	0.079 U	0.077 U	0.071 U	0.082 U	0.07 U	0.085 U	0.081 U	0.073 U	0.071 U
2,4,5-Trichlorophenol	NA	NA	6300	82000	0.2 U	0.19 U	0.22 U	0.19 U	0.18 U	0.17 U	0.19 U	0.17 U	0.19 U	0.21 U	0.2 U	0.2 U	0.18 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.18 U	0.2 U	0.18 U	0.21 U	0.2 U	0.18 U	0.18 U
2,4,6-Trichlorophenol	NA	NA	49	210	0.2 U	0.19 U	0.22 U	0.19 U	0.18 U	0.17 U	0.19 U	0.17 U	0.19 U	0.21 U	0.2 U	0.2 U	0.18 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.18 U	0.2 U	0.18 U	0.21 U	0.2 U	0.18 U	0.18 U
2,4-Dichlorophenol	NA	NA	190	2500	0.2 U	0.19 U	0.22 U	0.19 U	0.18 U	0.17 U	0.19 U	0.17 U	0.19 U	0.21 U	0.2 U	0.2 U	0.18 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.18 U	0.2 U	0.18 U	0.21 U	0.2 U	0.18 U	0.18 U
2,4-Dimethylphenol	NA	NA	1300	16000	0.2 U	0.19 U	0.22 U	0.19 U	0.18 U	0.17 U	0.19 U	0.17 U	0.19 U	0.21 U	0.2 U	0.2 U	0.18 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.18 U	0.2 U	0.18 U	0.21 U	0.2 U	0.18 U	0.18 U
2,4-Dinitrophenol	NA	NA	130	1600	0.2 U	0.19 U	0.22 U	0.19 U	0.18 U	0.17 U	0.19 U	0.17 U	0.19 U	0.21 U	0.2 U	0.2 U	0.18 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.18 U	0.2 U	0.18 U	0.21 U	0.2 U	0.18 U	0.18 U
2,4-Dinitrotoluene	NA	NA	1.7	7.4	0.04 U	0.038 U	0.043 U	0.039 U	0.037 U	0.034 U	0.038 U	0.034 U	0.038 U	0.042 UJ	0.04 U	0.039 U	0.035 U	0.037 U	0.039 U	0.038 U	0.039 U	0.038 U	0.036 U	0.041 U	0.035 U	0.043 U	0.04 U	0.036 U	0.035 UJ
2,6-Dinitrotoluene	NA	NA	0.36	1.5	0.04 U	0.038 U	0.043 U	0.039 U	0.037 U	0.034 U	0.038 U	0.034 U	0.038 U	0.042 UJ	0.04 U	0.039 U	0.035 U	0.037 U	0.039 U	0.038 U	0.039 U	0.038 U	0.036 U	0.041 U	0.035 U	0.043 U	0.04 U	0.036 U	0.035 UJ
2-Chloronaphthalene	NA	NA	4800	60000	0.081 U	0.075 U	0.086 U	0.077 U	0.074 U	0.069 U	0.077 U	0.068 U	0.076 U	0.083 UJ	0.08 U	0.078 U	0.07 U	0.074 U	0.078 U	0.077 U	0.079 U	0.077 U	0.071 U	0.082 U	0.07 U	0.085 U	0.081 U	0.073 U	0.071 UJ
2-Chlorophenol	NA	NA	390	5800	0.081 U	0.075 U	0.086 U	0.077 U	0.074 U	0.069 U	0.077 U	0.068 U	0.076 U	0.083 U	0.08 U	0.078 U	0.07 U	0.074 U	0.078 U	0.077 U	0.079 U	0.077 U	0.071 U	0.082 U	0.07 U	0.085 U	0.081 U	0.073 U	0.071 U
2-Methylnaphthalene	NA	NA	240	3000	0.04 U	0.038 U	0.043 U	0.039 U	0.037 U	0.034 U	0.038 U	0.034 U	0.038 U	0.042 UJ	0.04 U	0.039 U	0.0121 J	0.037 U	0.039 U	0.038 U	0.039 U	0.038 U	0.036 U	0.041 U	0.035 U	0.043 U	0.04 U	0.036 U	0.035 UJ
2-Methylphenol (o-Cresol)	NA	NA	3200	41000	0.081 U	0.075 U	0.086 U	0.077 U	0.074 U	0.069 U	0.077 U	0.068 U	0.076 U	0.083 U	0.08 U	0.078 U	0.07 U	0.074 U	0.078 U	0.077 U	0.079 U	0.077 U	0.071 U	0.082 U	0.07 U	0.085 U	0.081 U	0.073 U	0.071 U
2-Nitroaniline	NA	NA	630	8000	0.2 U	0.19 U	0.22 U	0.19 U	0.18 U	0.17 U	0.19 U	0.17 U	0.19 U	0.21 UJ	0.2 U	0.2 U	0.18 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.18 U	0.2 U	0.18 U	0.21 U	0.2 U	0.18 U	0.18 UJ
2-Nitrophenol	NA	NA	NA	NA	0.2 UJ	0.19 UJ	0.22 U	0.19 U	0.18 U	0.17 U	0.19 U	0.17 U	0.19 U	0.21 U	0.2 U	0.2 U	0.18 UJ	0.19 UJ	0.2 UJ	0.19 U	0.2 U	0.19 U	0.18 U	0.2 U	0.18 U	0.21 U	0.2 U	0.18 U	0.18 U
3&4-Methylphenol	NA	NA	NA	NA	0.081 U	0.075 U	0.086 U	0.077 U	0.074 U	0.069 U	0.077 U	0.068 U	0.076 U	0.083 U	0.08 U	0.078 U	0.07 U	0.074 U	0.078 U	0.077 U	0.079 U	0.077 U	0.071 U	0.082 U	0.07 U	0.085 U	0.081 U	0.073 U	0.071 U
3,3'-Dichlorobenzidine	NA	NA	1.2	5.1	0.081 U	0.075 U	0.086 U	0.077 U	0.074 U	0.069 U	0.077 U	0.068 U	0.076 U	0.083 UJ	0.08 U	0.078 U	0.07 U	0.074 U	0.078 U	0.077 U	0.079 U	0.077 U	0.071 U	0.082 U	0.07 U	0.085 U	0.081 U	0.073 U	0.071 UJ
3-Nitroaniline	NA	NA	NA	NA	0.2 U	0.19 U	0.22 U	0.19 U	0.18 U	0.17 U	0.19 U	0.17 U	0.19 U	0.21 UJ	0.2 U	0.2 U	0.18 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.18 U	0.2 U	0.18 U	0.21 U	0.2 U	0.18 U	0.18 UJ
4,6-Dinitro-2-methylphenol	NA	NA	5.1	66	0.2 U	0.19 U	0.22 U	0.19 U	0.18 U	0.17 U	0.19 U	0.17 U	0.19 U	0.21 U	0.2 U	0.2 U	0.18 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.18 U	0.2 U	0.18 U	0.21 U	0.2 U	0.18 U	0.18 U
4-Bromophenyl phenyl ether	NA	NA	NA	NA	0.081 U	0.075 U	0.086 U	0.077 U	0.074 U	0.069 U	0.077 U	0.068 U	0.076 U	0.083 U	0.08 U	0.078 U	0.07 U	0.074 U	0.078 U	0.077 U	0.079 U	0.077 U	0.071 U	0.082 U	0.07 U	0.085 U	0.081 U	0.073 U	0.071 UJ
4-Chloro-3-methylphenol	NA	NA	6300	82000	0.2 U	0.19 U	0.22 U	0.19 U	0.18 U	0.17 U	0.19 U	0.17 U	0.19 U	0.21 U	0.2 U	0.2 U	0.18 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.18 U	0.2 U	0.18 U	0.21 U	0.2 U	0.18 U	0.18 U
4-Chloroaniline	NA	NA	2.7	11	0.2 U	0.19 U	0.22 U	0.19 U	0.18 U	0.17 U	0.19 U	0.17 U	0.19 U	0.21 U	0.2 U	0.2 U	0.18 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.18 U	0.2 U	0.18 U	0.21 U	0.2 U	0.18 U	0.18 U
4-Chlorophenyl phenyl ether	NA	NA	NA	NA	0.081 U	0.075 U	0.086 U	0.077 U	0.074 U	0.069 U	0.077 U	0.068 U	0.076 U	0.083 UJ	0.08 U	0.078 U	0.07 U	0.074 U	0.078 U	0.077 U	0.079 U	0.077 U	0.071 U	0.082 U	0.07 U	0.085 U	0.081 U	0.073 U	0.071 UJ
4-Nitroaniline	NA	NA	27	110	0.2 U	0.19 U	0.22 U	0.19 U	0.18 U	0.17 U	0.19 U	0.17 U	0.19 U	0.21 UJ	0.2 U	0.2 U	0.18 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.18 U	0.2 U	0.18 U	0.21 U	0.2 U	0.18 U	0.18 UJ
4-Nitrophenol	NA	NA	NA	NA	0.4 U	0.38 U	0.43 U	0.39 U	0.37 U	0.34 U	0.38 U	0.34 U	0.38 U	0.42 U	0.4 U	0.39 U	0.35 U	0.37 U	0.39 U	0.38 U	0.39 U	0.38 U	0.36 U	0.41 U	0.35 U	0.43 U	0.4 U	0.36 U	0.35 U
Acenaphthene	NA	NA	3600	45000	0.04 U	0.038 U	0.043 U	0.039 U	0.037 U	0.034 U	0.038 U	0.034 U	0.038 U	0.042 UJ	0.04 U	0.039 U	0.035 U	0.037 U	0.039 U	0.038 U	0.039 U	0.038 U	0.036 U	0.041 U	0.035 U	0.043 U	0.04 U	0.036 U	0.0146 J-
Acenaphthylene	NA	NA	NA	NA	0.04 U	0.038 U	0.043 U	0.039 U	0.037 U	0.034 U	0.038 U	0.034 U	0.038 U	0.042 UJ	0.04 U	0.039 U	0.035 U	0.037 U	0.039 U	0.038 U	0.039 U	0.038 U	0.036 U	0.041 U	0.035 U	0.043 U	0.04 U	0.0247 J	0.0779 J-
Aniline	NA	NA	95	400	0.081 U	0.075 U	0.086 UJ	0.077 UJ	0.074 U	0.069 U	0.077 U	0.068 U	0.076 U	0.083 U	0.08 U	0.078 U	0.07 U	0.074 U	0.078 U	0.077 UJ	0.079 UJ	0.077 U	0.071 U	0.082 UJ	0.07 U	0.085 U	0.081 U	0.073 U	0.071 U
Anthracene	NA	NA	18000	230000	0.04 U	0.038 U	0.043 U	0.039 U	0.037 U	0.034 U	0.038 U	0.034 U	0.038 U	0.042 UJ	0.04 U	0.039 U	0.035 U	0.037 U	0.039 U	0.038 U	0.039 U	0.038 U	0.036 U	0.041 U	0.035 U	0.043 U	0.04 U	0.0227 J	0.0782 J-
Benzidine	NA	NA	0.00053	0.01	***0.4 U***	***0.38 U***	***0.43 UJ***	***0.39 UJ***	***0.37 U***	***0.34 U***	***0.38 U***	***0.34 U***	***0.38 U***	***0.42 UJ***	***0.4 U***	***0.39 U***	***0.35 U***	***0.37 U***	***0.39 U***	***0.38 UJ***	***0.39 UJ***	***0.38 U***	***0.36 U***	***0.41 UJ***	***0.35 U***	***0.43 U***	***0.4 U***	***0.36 U***	***0.35 UJ***
Benzo(a)anthracene	NA	NA	1.1	21	0.04 U	0.038 U	0.043 U	0.039 U	0.037 U	0.034 U	0.038 U	0.034 U	0.038 U	0.042 UJ	0.04 U	0.039 U	0.035 U	0.037 U	0.039 U	0.0482	0.039 U	0.038 U	0.036 U	0.041 U	0.035 U	0.043 U	0.04 U	0.086	0.196 J-
Benzo(a)pyrene	0.07	1.54	0.11	2.1	0.04 U	0.038 U	0.043 U	0.039 U	0.037 U	0.034 U	0.038 U	0.034 U	0.038 U	0.042 UJ	0.04 U	0.039 U	0.035 U	0.037 U	0.039 U	0.0513	0.039 U	0.038 U	0.036 U	0.041 U	0.035 U	0.043 U	0.04 U	**0.103**	**0.285 J-**
Benzo(b)fluoranthene	NA	NA	1.1	21	0.04 U	0.038 U	0.043 U	0.039 U	0.037 U	0.034 U	0.038 U	0.034 U	0.038 U	0.042 UJ	0.04 U	0.039 U	0.035 U	0.037 U	0.039 U	0.0676	0.039 U	0.038 U	0.036 U	0.041 U	0.035 U	0.043 U	0.04 U	0.158	0.445 J-
Benzo(g,h,i)perylene	NA	NA	NA	NA	0.04 U	0.038 U	0.043 U	0.039 U	0.037 U	0.034 U	0.038 U	0.034 U	0.038 U	0.042 UJ	0.04 U	0.039 U	0.035 U	0.037 U	0.039 U	0.0342 J	0.039 U	0.038 U	0.036 U	0.041 U	0.035 U	0.043 U	0.04 U	0.0629	0.187 J-
Benzo(k)fluoranthene	NA	NA	11	210	0.04 U	0.038 U	0.043 U	0.039 U	0.037 U	0.034 U	0.038 U	0.034 U	0.038 U	0.042 UJ	0.04 U	0.039 U	0.035 U	0.037 U	0.039 U	0.0265 J	0.039 U	0.038 U	0.036 U	0.041 U	0.035 U	0.043 U	0.04 U	0.0568	0.143 J-
Benzoic acid	NA	NA	250000	3.30E+06	0.81 U	0.75 U	0.86 R	0.77 R	0.74 U	0.69 U	0.77 U	0.68 U	0.76 U	0.83 U	0.8 U	0.78 U	0.7 U	0.74 U	0.78 U	0.77 R	0.79 R	0.77 U	0.71 U	0.82 U	0.7 U	0.85 U	0.81 U	0.73 U	0.71 U
Benzyl Alcohol	NA	NA	6300	82000	0.081 U	0.075 U	0.086 U	0.077 U	0.074 U	0.069 U	0.077 U	0.068 U	0.076 U	0.083 U	0.08 U	0.078 U	0.07 U	0.074 U	0.078 U	0.077 U	0.079 U	0.077 U	0.071 U	0.082 U	0.07 U	0.085 U	0.081 U	0.073 U	0.819
bis(2-Chloroethoxy)methane	NA	NA	190	2500	0.081 U	0.075 U	0.086 U	0.077 U	0.074 U	0.069 U	0.077 U	0.068 U	0.076 U	0.083 U	0.08 U	0.078 U	0.07 U	0.074 U	0.078 U	0.077 U	0.079 U	0.077 U	0.071 U	0.082 U	0.07 U	0.085 U	0.081 U	0.073 U	0.071 U
bis(2-Chloroethyl)ether	NA	NA	0.23	1	0.081 U	0.075 U	0.086 U	0.077 U	0.074 U	0.069 U	0.077 U	0.068 U	0.076 U	0.083 U	0.08 U	0.078 U	0.07 U	0.074 U	0.078 U	0.077 U	0.079 U	0.077 U	0.071 U	0.082 U	0.07 U	0.085 U	0.081 U	0.073 U	0.071 U
bis(2-Ethylhexyl)phthalate	20	120	39	160	0.034 J	0.075 U	0.0271 J	0.077 U	0.074 U	0.069 U	0.077 U	0.068 U	0.076 U	0.083 UJ	0.08 U	0.078 U	0.0576 J	0.074 U	0.078 U	0.0547 J	0.0104 J	0.077 U	0.071 U	0.0411 J	0.07 U	0.085 U	0.081 U	0.0572 J	0.0628 J-
Butyl benzylphthalate	NA	NA	290	1200	0.081 U	0.075 U	0.086 U	0.077 U	0.074 U	0.069 U	0.077 U	0.068 U	0.076 U	0.083 UJ	0.08 U	0.078 U	0.07 U	0.074 U	0.078 U	0.077 U	0.079 U	0.077 U	0.071 U	0.082 U	0.07 U	0.085 U	0.081 U	0.073 U	0.071 UJ
Carbazole	NA	NA	NA	NA	0.081 U	0.075 U	0.086 U	0.077 U	0.074 U	0.069 U	0.077 U	0.068 U	0.076 U	0.083 UJ	0.08 U	0.078 U	0.07 U	0.074 U	0.078 U	0.0097 J	0.079 U	0.077 U	0.071 U	0.082 U	0.07 U	0.085 U	0.081 U	0.073 U	0.0116 J-
Chrysene	NA	NA	110	2100	0.04 U	0.038 U	0.043 U	0.039 U	0.037 U	0.034 U	0.038 U	0.034 U	0.038 U	0.042 UJ	0.04 U	0.039 U	0.035 U	0.037 U	0.039 U	0.0497	0.039 U	0.038 U	0.036 U	0.041 U	0.035 U	0.043 U	0.04 U	0.079	0.209 J-
Dibenz(a,h)anthracene	NA	NA	0.11	2.1	0.04 U	0.038 U	0.043 U	0.039 U	0.037 U	0.034 U	0.038 U	0.034 U	0.038 U	0.042 UJ	0.04 U	0.039 U	0.035 U	0.037 U	0.039 U	0.038 U	0.039 U	0.038 U	0.036 U	0.041 U	0.035 U	0.043 U	0.04 U	0.036 U	0.0534 J-
Dibenzofuran	NA	NA	73	1000	0.081 U	0.075 U	0.086 U	0.077 U	0.074 U	0.069 U	0.077 U	0.068 U	0.076 U	0.083 UJ	0.08 U	0.078 U	0.07 U	0.074 U	0.078 U	0.077 U	0.079 U	0.077 U	0.071 U	0.082 U	0.07 U	0.085 U	0.081 U	0.073 U	0.071 UJ
Diethyl phthalate	NA	NA	51000	660000	0.081 U	0.075 U	0.086 U	0.077 U	0.074 U	0.069 U	0.077 U	0.068 U	0.076 U	0.083 UJ	0.08 U	0.078 U	0.07 U	0.074 U	0.078 U	0.077 U	0.079 U	0.077 U	0.071 U	0.082 U	0.07 U	0.085 U	0.081 U	0.073 U	0.071 UJ
Dimethyl phthalate	NA	NA	NA	NA	0.081 U	0.075 U	0.086 U	0.077 U	0.074 U	0.069 U	0.077 U	0.068 U	0.076 U	0.083 UJ	0.08 U	0.078 U	0.07 U	0.074 U	0.078 U	0.077 U	0.079 U	0.077 U	0.071 U	0.082 U	0.07 U	0.085 U	0.081 U	0.073 U	0.071 UJ
Di-n-butylphthalate	NA	NA	6300	82000	0.081 U	0.075 U	0.086 U	0.077 U	0.074 U	0.069 U	0.077 U	0.068 U	0.076 U	0.083 UJ	0.08 U	0.078 U	0.07 U	0.074 U	0.078 U	0.077 U	0.079 U	0.077 U	0.071 U	0.082 U	0.07 U	0.085 U	0.081 U	0.073 U	0.071 UJ
Di-n-octyl phthalate	NA	NA	630	8200	0.081 U	0.075 U	0.086 U	0.077 U	0.074 U	0.069 U	0.077 U	0.068 U	0.076 U	0.083 UJ	0.08 U	0.078 U	0.07 U	0.074 U	0.078 U	0.077 U	0.079 U	0.077 U	0.071 U	0.082 U	0.07 U	0.085 U	0.081 U	0.073 U	0.071 UJ
Fluoranthene	2301	26371	2400	30000	0.04 U	0.038 U	0.043 U	0.039 U	0.037 U	0.034 U	0.038 U	0.034 U	0.038 U	0.042 UJ	0.04 U	0.039 U	0.035 U	0.037 U	0.039 U	0.124	0.039 U	0.038 U	0.036 U	0.041 U	0.035 U	0.043 U	0.04 U	0.13	0.288 J-
Fluorene	2301	26371	2400	30000	0.04 U	0.038 U	0.043 U	0.039 U	0.037 U	0.034 U	0.038 U	0.034 U	0.038 U	0.042 UJ	0.04 U	0.039 U	0.035 U	0.037 U	0.039 U	0.038 U	0.039 U	0.038 U	0.036 U	0.041 U	0.035 U	0.043 U	0.04 U	0.036 U	0.035 UJ
Hexachlorobenzene	0.13	0.69	0.21	0.96	0.081 U	0.075 U	0.086 U	0.077 U	0.074 U	0.069 U	0.077 U	0.068 U	0.076 U	0.083 UJ	0.08 U	0.078 U	0.07 U	0.074 U	0.078 U	0.077 U	0.079 U	0.077 U	0.071 U	0.082 U	0.07 U	0.085 U	0.081 U	0.073 U	0.071 UJ
Hexachlorobutadiene	NA	NA	1.2	5.3	0.04 U	0.038 U	0.043 U	0.039 U	0.037 U	0.034 U	0.038 U	0.034 U	0.038 U	0.042 U	0.04 U	0.039 U	0.035 U	0.037 U	0.039 U	0.038 U	0.039 U	0.038 U	0.036 U	0.041 U	0.035 U	0.043 U	0.04 U	0.036 U	0.035 U
Hexachlorocyclopentadiene	NA	NA	1.8	7.5	0.4 U	0.38 U	0.43 U	0.39 U	0.37 U	0.34 U	0.38 U	0.34 U	0.38 U	0.42 UJ	0.4 U	0.39 U	0.35 U	0.37 U	0.39 U	0.38 U	0.39 U	0.38 U	0.36 U	0.41 U	0.35 U	0.43 U	0.4 U	0.36 U	0.35 UJ
Hexachloroethane	NA	NA	1.8	8	0.2 U	0.19 U	0.22 U	0.19 U	0.18 U	0.17 U	0.19 U	0.17 U	0.19 U	0.21 U	0.2 U	0.2 U	0.18 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.18 U	0.2 U	0.18 U	0.21 U	0.2 U	0.18 U	0.18 U
Indeno(1,2,3-cd)pyrene	NA	NA	1.1	21	0.04 U	0.038 U	0.043 U	0.039 U	0.037 U	0.034 U	0.038 U	0.034 U	0.038 U	0.042 UJ	0.04 U	0.039 U	0.035 U	0.037 U	0.039 U	0.0351 J	0.039 U	0.038 U	0.036 U	0.041 U	0.035 U	0.043 U	0.04 U	0.0988	0.204 J-
Isophorone	NA	NA	570	2400	0.081 U	0.075 U	0.086 U	0.077 U	0.074 U	0.069 U	0.077 U	0.068 U	0.076 U	0.083 U	0.08 U	0.078 U	0.07 U	0.074 U	0.078 U	0.077 U	0.079 U	0.077 U	0.071 U	0.082 U	0.07 U	0.085 U	0.081 U	0.073 U	0.071 U
Naphthalene	2.7	16	3.8	17	0.04 U	0.038 U	0.043 U	0.039 U	0.037 U	0.034 U	0.038 U	0.034 U	0.038 U	0.042 U	0.04 U	0.039 U	0.035 U	0.037 U	0.039 U	0.038 U	0.039 U	0.038 U	0.036 U	0.041 U	0.035 U	0.043 U	0.04 U	0.036 U	0.035 U
Nitrobenzene	NA	NA	5.1	22	0.081 U	0.075 U	0.086 U	0.077 U	0.074 U	0.069 U	0.077 U	0.068 U	0.076 U	0.083 U	0.08 U	0.078 U	0.07 U	0.074 U	0.078 U	0.077 U	0.079 U	0.077 U	0.071 U	0.082 U	0.07 U	0.085 U	0.081 U	0.073 U	0.071 U
N-Nitrosodimethylamine	NA	NA	0.002	0.034	***0.081 UJ***	***0.075 UJ***	***0.086 U***	***0.077 U***	***0.074 U***	***0.069 U***	***0.077 U***	***0.068 U***	***0.076 U***	***0.083 UJ***	***0.08 U***	***0.078 U***	***0.07 UJ***	***0.074 UJ***	***0.078 UJ***	***0.077 U***	***0.079 U***	***0.077 U***	***0.071 U***	***0.082 U***	***0.07 U***	***0.085 U***	***0.081 U***	***0.073 U***	***0.071 U***
N-Nitrosodi-n-propylamine	NA	NA	0.078	0.33	**0.081 U**	0.075 U	**0.086 U**	0.077 U	0.074 U	0.069 U	0.077 U	0.068 U	0.076 U	**0.083 U**	**0.08 U**	0.078 U	0.07 U	0.074 U	0.078 U	0.077 U	**0.079 U**	0.077 U	0.071 U	**0.082 U**	0.07 U	**0.085 U**	**0.081 U**	0.073 U	0.071 U
N-Nitrosodiphenylamine	NA	NA	110	470	0.2 U	0.19 U	0.22 U	0.19 U	0.18 U	0.17 U	0.19 U	0.17 U	0.19 U	0.21 UJ	0.2 U	0.2 U	0.18 U	0.19 U	0.2 U	0.19 U	0.2 U	0.19 U	0.18 U	0.2 U	0.18 U	0.21 U	0.2 U	0.18 U	0.18 UJ
Pentachlorophenol	0.48	2.9	1	4	0.16 U	0.15 U	0.17 U	0.15 U	0.15 U	0.14 U	0.15 U	0.14 U	0.15 U	0.17 U	0.16 U	0.16 U	0.14 U	0.15 U	0.16 U	0.15 U	0.16 U	0.15 U	0.14 U	0.16 U	0.14 U	0.17 U	0.16 U	0.15 U	0.14 U
Phenanthrene	NA	NA	NA	NA	0.04 U	0.038 U	0.043 U	0.039 U	0.037 U	0.034 U	0.038 U	0.034 U	0.038 U	0.042 U	0.04 U	0.039 U	0.0308 J	0.037 U	0.039 U	0.0809	0.039 U	0.038 U	0.036 U	0.041 U	0.035 U	0.043 U	0.04 U	0.0158 J	0.0453
Phenol	NA	NA	19000	250000	0.081 U	0.075 U	0.086 U	0.077 U	0.074 U	0.069 U	0.077 U	0.068 U	0.076 U	0.083 U	0.08 U	0.078 U	0.07 U	0.074 U	0.078 U	0.077 U	0.079 U	0.077 U	0.071 U	0.082 U	0.07 U	0.085 U	0.081 U	0.073 U	0.0572 J
Pyrene	NA	NA	1800	23000	0.04 U	0.038 U	0.043 U	0.039 U	0.037 U	0.034 U	0.038 U	0.034 U	0.038 U	0.042 UJ	0.04 U	0.039 U	0.035 U	0.037 U	0.039 U	0.0937	0.039 U	0.038 U	0.036 U	0.041 U	0.035 U	0.043 U	0.04 U	0.177	0.361 J-
Pyridine	NA	NA	78	1200	0.081 UJ	0.075 UJ	0.086 U	0.077 U	0.074 U	0.069 U	0.077 U	0.068 U	0.076 U	0.083 U	0.08 U	0.078 U	0.07 UJ	0.074 UJ	0.078 UJ	0.077 U	0.079 U	0.077 U	0.071 U	0.082 U	0.07 U	0.085 U	0.081 U	0.073 U	0.071 U
Benzo(a)Pyrene Equivalent (ND = 0 RL)	0.07	1.54	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.067	ND	ND	ND	ND	ND	ND	ND	**0.14**	**0.42**
Benzo(a)Pyrene Equivalent (ND = 1/2 RL)	0.07	1.54	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**0.086**	ND	ND	ND	ND	ND	ND	ND	**0.16**	**0.42**

TABLE 5.13-1
AOC 13 - SEPTIC SYSTEMS AND APPLICATION AREAS: SOIL ANALYTICAL RESULTS COMPARED TO RESIDENTIAL AND NON-RESIDENTIAL SOIL CRITERIA
VERMONT YANKEE
VERNON, VERMONT

Location Name	VT ANR	VT ANR	USEPA RSL	USEPA RSL	DP1301	DP1301	DP1302	DP1302	DP1303	DP1303	DP1304	DP1304	DP1305	DP1305	DP1306	DP1306	DP1307	DP1307	DP1307	DP1308	DP1308	DP1309	DP1309	DP1310	DP1310	DP1311	DP1311	SP1301	SP1302
Sample Name	2019 Proposed	2019 Proposed	Residential Soil	Industrial Soil	DP130101	DP130105	DP130201	DP130212	DP130301	DP130318	DP130401	DP130419	DP130501	DP130510	DP130601	DP130606	DP130701	DP130701DUP	DP130706	DP130801	DP130806	DP130901	DP130912	DP131001	DP131008	DP131101	DP131106	SP130100	SP130200
Sample Date	Residential Soil	Non-Residential Soil	HI = 1.0	HI = 1.0	04/30/2019	04/30/2019	04/30/2019	04/30/2019	05/01/2019	05/01/2019	05/01/2019	05/01/2019	05/01/2019	05/01/2019	04/30/2019	04/30/2019	04/30/2019	04/30/2019	04/30/2019	04/30/2019	04/30/2019	04/29/2019	04/29/2019	04/29/2019	04/29/2019	04/29/2019	04/29/2019	05/16/2019	05/16/2019
Lab Sample ID			May 2019	May 2019	JC87266-9	JC87266-8	JC87266-11	JC87266-10	JC87364-9	JC87364-10	JC87364-11	JC87364-12	JC87364-6	JC87364-5	JC87364-2	JC87364-1	JC87266-6	JC87266-7	JC87266-5	JC87266-18	JC87266-17	JC87184-1	JC87184-2	JC87184-5	JC87184-6	JC87184-3	JC87184-4	JC88412-1	JC88412-2
Sample Depth (bgs)					0 - 1 (ft)	5 - 7 (ft)	0 - 1 (ft)	12 - 14 (ft)	0 - 1 (ft)	18 - 20 (ft)	0 - 1 (ft)	19 - 20 (ft)	0 - 1 (ft)	10 - 12 (ft)	0 - 1 (ft)	6 - 8 (ft)	0 - 1 (ft)	0 - 1 (ft)	6 - 8 (ft)	0 - 1 (ft)	6 - 8 (ft)	0 - 1 (ft)	12 - 14 (ft)	0 - 1 (ft)	8 - 10 (ft)	0 - 1 (ft)	6 - 8 (ft)	0 - 0.5 (ft)	0 - 0.5 (ft)
Total Petroleum Hydrocarbons (mg/kg)																													
Total Petroleum Hydrocarbons (C10-C28) DRO	NA	NA	NA	NA	11 U	12 U	12 U	11 U	9.7 U	9.7 U	11 U	8.9 U	11 U	11 U	11 U	12 U	10 U	11 U	12 U	11 U	11 U	11 U	10 U	12 U	9.8 U	13 U	12 U	10 U	53.1
Total Petroleum Hydrocarbons (C6-C10) GRO	NA	NA	NA	NA	30 U	20 U	33 U	20 U	21 U	24 U	20 U	27 U	24 U	54 U	27 U	25 U	23 U	24 U	22 U	30 U	23 U	28 U	20 U	35 U	24 U	44 U	26 U	21 U	23 U
Inorganic Compounds (mg/kg)																													
Aluminum	72507	941748	77000	1.10E+06	11200	10400	19200	6980	10700 J+	5270 J+	11500 J+	5340 J+	11500 J+	6280 J+	12700 J+	11500 J+	7770	9180	15400	10800	14000	9680	7240	11900	6310	16000	9290	9010 J+	11200 J+
Antimony	26	319	31	470	2.4 U	2.3 U	2.6 U	2.3 U	2.2 UJ	2 UJ	2.3 UJ	2 UJ	2.4 UJ	2.5 UJ	2.4 UJ	2.4 UJ	2.1 U	2.2 U	2.4 U	2.4 U	2.4 U	2.2 U	2.1 U	2.4 U	2.1 U	2.7 U	2.5 U	2.3 UJ	2.1 UJ
Arsenic	16	16	0.68	3	3.9	3.8	5.4	2.3	6.8	2 U	6.7	2 U	5.8	6.4	4.1	4.4	3.6	4.1	4.3	6	4.3	4.5	2.6	6	3	6.1	2.5 U	10.6	7.9
Barium	11247	127382	15000	220000	37.6	33.9	70	23 U	32.4	20 U	33.6	20 U	34.9	25 U	38.5	26	37.3	32.3	66.4	33.5	48.8	24.5	37.3	35.9	115	61.8	26.5	25.3	23.9
Beryllium	35	289	160	2300	0.42	0.36	0.63	0.26	0.32	0.2 U	0.35	0.2 U	0.36	0.25 U	0.41	0.43	0.27	0.3	0.59	0.37	0.5	0.43	0.32	0.53	0.31	0.65	0.44	0.23 U	0.21 U
Cadmium	6.9	87	71	980	0.6 U	0.57 U	0.65 U	0.57 U	0.55 U	0.51 U	0.58 U	0.5 U	0.59 U	0.62 U	0.61 U	0.61 U	0.53 U	0.56 U	0.6 U	0.6 U	0.59 U	0.56 U	0.52 U	0.6 U	0.52 U	0.68 U	0.62 U	0.58 U	0.54 U
Calcium	NA	NA	NA	NA	1420	5130	1810	1450	1180	957	1220	888	1220	1500	1740	1650	1050	1680	1410	1830	1620	1550	1350	1530	1990	1910	2010	1660	3620
Chromium	NA	NA	NA	NA	18.9	22.2	30.7	14.1	17	11.2	18.4	10.1	18	17.1	18.2	19.6	17.9	17.6	23.5	19.2	22	16.6	17	19.2	18	25.8	16.5	14.6	14.6
Cobalt	22	291	23	350	7.4	7.6	11.6	5.7 U	7.6	5.1 U	8.4	5 U	8.2	6.2 U	7.8	8.3	9.2	8.3	8.4	8.8	8.4	7.4	6.3	8.7	9.2	9.9	6.2 U	8.7	11.3
Copper	10407	139231	3100	47000	17	13.4	33.3	10.2	13.8	5.3	17.1	4.7	17.9	6.5	13.8	15.1	16.8	14.9	16.4	27.8	16.5	17.4	6.5	20.5	8.6	23.4	13.1	19.7	24.4
Iron	51302	686351	55000	820000	17900	17300	27800	10700	18600	11900	19100	9710	18000	9330	18400	17700	18100	18500	20600	19600	18600	15300	13300	18200	14700	21500	12300	17800	26300
Lead	400	800	400	800	7.8	6.6	12.2	3.4	8	2.3	9.4	2.5	7.8	3.3	9.2	5.7	5.5	5.5	12.2	6.7	11.7	6	4.1	8.1	2.8	16.1	4.7	18.4	13
Magnesium	NA	NA	NA	NA	4350	4550	7090	3400	3980	2760	4440	2920	4350	2820	4360	4780	4340	4290	5240	4980	4960	3980	4330	4530	3810	5480	4050	3970	5830
Manganese	1118	11350	1800	26000	353	405	570	122	349	140	386	123	399	122	376	363	685	441	344	362	280	351	216	425	**1470**	581	198	464	494
Mercury	3.1	3.1	11	46	0.032 U	0.038 U	0.034 U	0.036 U	0.037 U	0.034 U	0.039 U	0.031 U	0.039 U	0.033 U	0.041 U	0.039 U	0.033 U	0.03 U	0.037 U	0.035 U	0.035 U	0.034 U	0.033 U	0.039 U	0.035 U	0.042 U	0.04 U	0.033 U	0.033 U
Nickel	940	9707	1500	22000	19.9	19.8	29.7	12.9	17.4	12	21.5	11.5	20.1	10.3	18.7	21.2	29.1	23	23.9	21.4	22.3	19.1	17.1	21.2	56.4	24.5	16.2	19.7	20.5
Potassium	NA	NA	NA	NA	1200 U	1100 U	1470	1100 U	1100 U	1000 U	1200 U	1000 U	1200 U	1200 U	1200 U	1200 U	1120	1100 U	1200 U	1200 U	1200 U	1100 U	1000 U	1200 U	1000 U	1400 U	1200 U	1200 U	1100 U
Selenium	366	4900	390	5800	2.4 U	2.3 U	5.2 U	2.3 U	2.2 U	2 U	2.3 U	2 U	2.4 U	2.5 U	2.4 U	2.4 U	2.1 U	2.2 U	2.4 U	2.4 U	2.4 U	2.2 U	2.1 U	2.4 U	2.1 U	2.7 U	2.5 U	2.3 U	4.3 U
Silver	237	2483	390	5800	0.6 U	0.57 U	1.3 U	0.57 U	0.55 U	0.51 U	0.58 U	0.5 U	0.59 U	0.62 U	0.61 U	0.61 U	0.53 U	0.56 U	0.6 U	0.6 U	0.59 U	0.56 U	0.52 U	0.6 U	0.52 U	0.68 U	0.62 U	0.58 U	1.1 U
Sodium	NA	NA	NA	NA	1200 U	1100 U	1300 U	1100 U	1100 U	1000 U	1200 U	1000 U	1200 U	1200 U	1200 U	1200 U	1100 U	1100 U	1200 U	1200 U	1200 U	1100 U	1000 U	1200 U	1000 U	1400 U	1200 U	1200 U	1100 U
Thallium	0.73	196100	0.78	12	**1.2 U**	**1.1 U**	**2.6 U**	**1.1 U**	**1.1 U**	**1 U**	**1.2 U**	**1 U**	**1.2 U**	**1.2 U**	**1.2 U**	**1.2 U**	**1.1 U**	**1.1 U**	**1.2 U**	**1.2 U**	**1.2 U**	**1.1 U**	**1 U**	**1.2 U**	**2.1 U**	**1.4 U**	**1.2 U**	**1.2 U**	**2.1 U**
Vanadium	2.8	27	390	5800	**21.9**	**19.4**	***33***	**15.4**	**20.5**	**12.9**	**22.3**	**10.8**	**21.4**	**23.3**	**23.8**	**22.3**	**17.3**	**20.4**	**25.6**	**21.8**	**24.7**	**20.1**	**17.5**	**23.6**	**12**	***29.4***	**20.2**	**20.2**	***35.4***
Zinc	21986	294150	23000	350000	42.8	36.1	85.7	27.8	44.3	20.9	48	21.1	45.7	22.1	44.5	39	32.9	33.3	54.5	47.8	54.6	38.8	29.3	47.8	29.1	76.4	34.2	78.3	74.5
PCBs (mg/kg)																													
Aroclor-1016 (PCB-1016)	NA	NA	4.1	27	-	-	-	-	0.038 U	0.034 U	0.04 U	0.034 U	0.037 U	0.039 U	0.039 U	0.038 U	-	-	-	-	-	-	-	-	-	-	-	0.036 U	0.034 U
Aroclor-1221 (PCB-1221)	NA	NA	0.2	0.83	-	-	-	-	0.038 U	0.034 U	0.04 U	0.034 U	0.037 U	0.039 U	0.039 U	0.038 U	-	-	-	-	-	-	-	-	-	-	-	0.036 U	0.034 U
Aroclor-1232 (PCB-1232)	NA	NA	0.17	0.72	-	-	-	-	0.038 U	0.034 U	0.04 U	0.034 U	0.037 U	0.039 U	0.039 U	0.038 U	-	-	-	-	-	-	-	-	-	-	-	0.036 U	0.034 U
Aroclor-1242 (PCB-1242)	NA	NA	0.23	0.95	-	-	-	-	0.038 U	0.034 U	0.04 U	0.034 U	0.037 U	0.039 U	0.039 U	0.038 U	-	-	-	-	-	-	-	-	-	-	-	0.036 U	0.034 U
Aroclor-1248 (PCB-1248)	NA	NA	0.23	0.95	-	-	-	-	0.038 U	0.034 U	0.04 U	0.034 U	0.037 U	0.039 U	0.039 U	0.038 U	-	-	-	-	-	-	-	-	-	-	-	0.036 U	0.034 U
Aroclor-1254 (PCB-1254)	NA	NA	0.24	0.97	-	-	-	-	0.038 U	0.034 U	0.04 U	0.034 U	0.037 U	0.039 U	0.039 U	0.038 U	-	-	-	-	-	-	-	-	-	-	-	0.036 U	0.034 U
Aroclor-1260 (PCB-1260)	NA	NA	0.24	0.99	-	-	-	-	0.038 U	0.034 U	0.04 U	0.034 U	0.037 U	0.039 U	0.039 U	0.038 U	-	-	-	-	-	-	-	-	-	-	-	0.036 U	0.034 U
Aroclor-1262 (PCB-1262)	NA	NA	NA	NA	-	-	-	-	0.038 U	0.034 U	0.04 U	0.034 U	0.037 U	0.039 U	0.039 U	0.038 U	-	-	-	-	-	-	-	-	-	-	-	0.036 U	0.034 U
Aroclor-1268 (PCB-1268)	NA	NA	NA	NA	-	-	-	-	0.038 U	0.034 U	0.04 U	0.034 U	0.037 U	0.039 U	0.039 U	0.038 U	-	-	-	-	-	-	-	-	-	-	-	0.036 U	0.034 U
SUM of PCBs	NA	NA	0.23	0.94	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-	-	-	-	-	-	-	ND	ND
Other																													
Total Solids (%)	NA	NA	NA	NA	81.2	85.4	75.7	86.2	86.9	95.5	83.4	96.7	82.8	76.6	81.6	82.3	92.7	86.9	81.3	85.5	82.9	86.6	93.3	81.5	94.2	77.1	82.1	87.8	88.8

ABBREVIATIONS AND NOTES:
-: Not Analyzed
*: Outside of QC limits
J: value is estimated
mg/kg: milligram per kilogram
NA: Not Applicable
RSL: Risk-Based Screening Levels
U: Not detected, value is the laboratory reporting limit
VT ANR: Vermont Agency of Natural Resources
USEPA: United State Environmental Protection Agency

- Volatile and Semi-Volatile analytes detected in at least one sample are reported herein. For a complete list of analytes see the laboratory data sheets.
- Bold values indicate an exceedance of the Proposed 2019 VT ANR Residential Soil values and the USEPA May 2019 Residential Soil RSL where no VT ANR value is available.

TABLE 5.13-2
AOC 13 - SEPTIC SYSTEMS AND APPLICATION AREAS: GROUNDWATER ANALYTICAL RESULTS COMPARED TO GROUNDWATER ENFORCEMENT STANDARDS
VERMONT YANKEE
VERNON, VERMONT

Location Name Sample Name Sample Date Lab Sample ID	VT ANR Proposed 2019 Groundwater Enforcement	DP1306 GW1306-20190508 05/08/2019 JC87972-5	DP1307 GW1307-20190508 05/08/2019 JC87972-6	DP1308 GW1308-20190508 05/08/2019 JC87972-1	DP1309 GW1309-20190429 04/29/2019 JC87443-6	DP1309 GW1309DUP-20190429 04/29/2019 JC87443-7	DP1310 GW1310-20190429 04/29/2019 JC87443-2	DP1311 GW1311-20190429 04/29/2019 JC87443-5
Volatile Organic Compounds (ug/L)								
1,1,1,2-Tetrachloroethane	70	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,1-Trichloroethane	200	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	70	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	7	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloropropene	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2,3-Trichlorobenzene	0.9	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**
1,2,3-Trichloropropane	0.02	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**
1,2,4-Trichlorobenzene	70	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2,4-Trimethylbenzene	23	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,2-Dibromo-3-chloropropane (DBCP)	0.2	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**
1,2-Dibromoethane (Ethylene Dibromide)	0.05	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**
1,2-Dichlorobenzene	600	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloropropane	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,3,5-Trimethylbenzene	23	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,3-Dichlorobenzene	600	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,3-Dichloropropane	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	75	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2,2-Dichloropropane	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2-Butanone (Methyl Ethyl Ketone)	511	10 U	7.8 J	10 U	10 U	10 U	10 U	10 U
2-Chlorotoluene	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U
2-Phenylbutane (sec-Butylbenzene)	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U
4-Chlorotoluene	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	NA	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Acetone	950	23 U	36.1 J+	26.6 U	10 U	10 U	10 U	10 U
Benzene	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Bromobenzene	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromodichloromethane	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromoform	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromomethane (Methyl Bromide)	5	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Carbon tetrachloride	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	100	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobromomethane	8	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroethane	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroform (Trichloromethane)	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloromethane (Methyl Chloride)	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
cis-1,2-Dichloroethene	70	1 U	1 U	1 U	1 U	1 U	1 U	1 U
cis-1,3-Dichloropropene	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Cymene (p-Isopropyltoluene)	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Dibromochloromethane	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Dibromomethane	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Dichlorodifluoromethane (CFC-12)	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Ethylbenzene	700	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Hexachlorobutadiene	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Isopropylbenzene (Cumene)	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
m,p-Xylenes	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Methyl Tert Butyl Ether	11	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Methylene chloride	5	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Naphthalene	0.5	**5 U**	**5 U**	**5 U**	**5 U**	**5 U**	**5 U**	**5 U**
n-Butylbenzene	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U
n-Propylbenzene	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U
o-Xylene	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Styrene	100	1 U	1 U	1 U	1 U	1 U	1 U	1 U
tert-Butylbenzene	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Tetrachloroethene	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	1000	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,2-Dichloroethene	100	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,3-Dichloropropene	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichlorofluoromethane (CFC-11)	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Vinyl chloride	2	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Xylene (total)	10000	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Semi-Volatile Organic Compounds (ug/L)								
1,2,4-Trichlorobenzene	70	2 U	1.2 U	2 U	0.93 U	0.97 U	1.1 U	1 U
1,2-Dichlorobenzene	600	2 U	1.2 U	2 U	0.93 U	0.97 U	1.1 U	1 U
1,2-Diphenylhydrazine	NA	2 U	1.2 U	2 U	0.93 U	0.97 U	1.1 U	1 U
1,3-Dichlorobenzene	600	2 U	1.2 U	2 U	0.93 U	0.97 U	1.1 U	1 U
1,4-Dichlorobenzene	75	2 U	1.2 U	2 U	0.93 U	0.97 U	1.1 U	1 U
1-Methylnaphthalene	NA	2 U	1.2 U	2 U	0.93 U	0.97 U	1.1 U	1 U
2,2'-oxybis(1-Chloropropane)	46	4 U	2.4 U	4 U	1.9 U	1.9 U	2.2 U	2 U
2,4,5-Trichlorophenol	NA	10 U	6.1 U	10 U	4.6 U	4.9 U	5.6 U	5.1 U
2,4,6-Trichlorophenol	NA	10 U	6.1 U	10 U	4.6 U	4.9 U	5.6 U	5.1 U
2,4-Dichlorophenol	NA	4 U	2.4 U	4 U	1.9 U	1.9 U	2.2 U	2 U
2,4-Dimethylphenol	NA	10 U	6.1 U	10 U	4.6 U	4.9 U	5.6 U	5.1 U
2,4-Dinitrophenol	NA	10 U	6.1 U	10 U	4.6 U	4.9 U	5.6 U	5.1 U
2,4-Dinitrotoluene	NA	2 U	1.2 U	2 U	0.93 U	0.97 U	1.1 U	1 U
2,6-Dinitrotoluene	NA	2 U	1.2 U	2 U	0.93 U	0.97 U	1.1 U	1 U
2-Chloronaphthalene	NA	4 U	2.4 U	4 U	1.9 U	1.9 U	2.2 U	2 U
2-Chlorophenol	NA	10 U	6.1 U	10 U	4.6 U	4.9 U	5.6 U	5.1 U
2-Methylnaphthalene	NA	2 U	1.2 U	2 U	0.93 U	0.97 U	1.1 U	1 U
2-Methylphenol (o-Cresol)	NA	4 U	2.4 U	4 U	1.9 U	1.9 U	2.2 U	2 U
2-Nitroaniline	NA	10 U	6.1 U	10 U	4.6 U	4.9 U	5.6 U	5.1 U
2-Nitrophenol	NA	10 U	6.1 U	10 U	4.6 U	4.9 U	5.6 U	5.1 U
3&4-Methylphenol	NA	4 U	2.4 U	4 U	1.9 U	1.9 U	2.2 U	2 U
3,3'-Dichlorobenzidine	NA	4 U	2.4 U	4 U	1.9 U	1.9 U	2.2 U	2 U
3-Nitroaniline	NA	10 U	6.1 U	10 U	4.6 U	4.9 U	5.6 U	5.1 U
4,6-Dinitro-2-methylphenol	NA	10 U	6.1 U	10 U	4.6 U	4.9 U	5.6 U	5.1 U
4-Bromophenyl phenyl ether	NA	4 U	2.4 U	4 U	1.9 U	1.9 U	2.2 U	2 U
4-Chloro-3-methylphenol	NA	10 U	6.1 U	10 U	4.6 U	4.9 U	5.6 U	5.1 U
4-Chloroaniline	NA	10 U	6.1 U	10 U	4.6 U	4.9 U	5.6 U	5.1 U
4-Chlorophenyl phenyl ether	NA	4 U	2.4 U	4 U	1.9 U	1.9 U	2.2 U	2 U
4-Nitroaniline	NA	10 U	6.1 U	10 U	4.6 U	4.9 U	5.6 U	5.1 U
4-Nitrophenol	NA	20 U	12 U	20 U	9.3 U	9.7 U	11 U	10 U
Acenaphthene	NA	2 U	1.2 U	2 U	0.93 U	0.97 U	1.1 U	1 U
Acenaphthylene	NA	2 U	1.2 U	2 U	0.93 U	0.97 U	1.1 U	1 U
Aniline	NA	4 U	2.4 U	4 U	1.9 U	1.9 U	2.2 U	2 U
Anthracene	343	2 U	1.2 U	2 U	0.93 U	0.97 U	1.1 U	1 U
Benzidine	NA	20 UJ	12 UJ	20 UJ	9.3 U	9.7 U	11 U	10 U
Benzo(a)anthracene	NA	2 U	1.2 U	2 U	0.93 U	0.97 U	1.1 U	1 U
Benzo(a)pyrene	0.2	**2 U**	**1.2 U**	**2 U**	**0.93 U**	**0.97 U**	**1.1 U**	**1 U**
Benzo(b)fluoranthene	NA	2 U	1.2 U	2 U	0.93 U	0.97 U	1.1 U	1 U
Benzo(g,h,i)perylene	NA	2 U	1.2 U	2 U	0.93 U	0.97 U	1.1 U	1 U
Benzo(k)fluoranthene	NA	2 U	1.2 U	2 U	0.93 U	0.97 U	1.1 U	1 U
Benzoic acid	NA	40 U	24 U	40 U	19 U	19 U	22 U	20 U
Benzyl Alcohol	NA	4 U	2.4 U	4 U	1.9 U	1.9 U	2.2 U	2 U
bis(2-Chloroethoxy)methane	NA	4 U	2.4 U	4 U	1.9 U	1.9 U	2.2 U	2 U
bis(2-Chloroethyl)ether	NA	4 U	2.4 U	4 U	1.9 U	1.9 U	2.2 U	2 U
bis(2-Ethylhexyl)phthalate	6	4 U	3.6	4 U	1.9 U	1.9 U	2.2 U	2 U
Butyl benzylphthalate	NA	4 U	2.4 U	4 U	1.9 U	1.9 U	2.2 U	2 U
Carbazole	NA	2 U	1.2 U	2 U	0.93 U	0.97 U	1.1 U	1 U
Chrysene	NA	2 U	1.2 U	2 U	0.93 U	0.97 U	1.1 U	1 U
Dibenz(a,h)anthracene	NA	2 U	1.2 U	2 U	0.93 U	0.97 U	1.1 U	1 U
Dibenzofuran	NA	10 U	6.1 U	10 U	4.6 U	4.9 U	5.6 U	5.1 U
Diethyl phthalate	NA	4 U	1.5 J	4.3	6.1	6.8	7.4	21.6
Dimethyl phthalate	NA	4 U	2.4 U	4 U	3.7	4.6	2.8	10.8
Di-n-butylphthalate	NA	4 U	1.5 J	4 U	1.9 U	1.9 U	2.2 U	2 U
Di-n-octyl phthalate	NA	4 U	2.4 U	4 U	1.9 U	1.9 U	2.2 U	2 U
Fluoranthene	46	2 U	1.2 U	2 U	0.93 U	0.97 U	1.1 U	1 U
Fluorene	46	2 U	1.2 U	2 U	0.93 U	0.97 U	1.1 U	1 U
Hexachlorobenzene	1	**2 U**	**1.2 U**	**2 U**	0.93 U	0.97 U	**1.1 U**	1 U
Hexachlorobutadiene	NA	2 U	1.2 U	2 U	0.93 U	0.97 U	1.1 U	1 U
Hexachlorocyclopentadiene	50	20 U	12 U	20 U	9.3 U	9.7 U	11 U	10 U
Hexachloroethane	NA	4 U	2.4 U	4 U	1.9 U	1.9 U	2.2 U	2 U
Indeno(1,2,3-cd)pyrene	NA	2 U	1.2 U	2 U	0.93 U	0.97 U	1.1 U	1 U
Isophorone	NA	4 U	2.4 U	4 U	1.9 U	1.9 U	2.2 U	2 U
Naphthalene	0.5	**2 U**	**1.2 U**	**2 U**	**0.93 U**	**0.97 U**	**1.1 U**	**1 U**
Nitrobenzene	NA	4 U	2.4 U	4 U	1.9 U	1.9 U	2.2 U	2 U
N-Nitrosodimethylamine	NA	4 U	2.4 U	4 U	1.9 U	1.9 U	2.2 U	2 U
N-Nitrosodi-n-propylamine	NA	4 U	2.4 U	4 U	1.9 U	1.9 U	2.2 U	2 U
N-Nitrosodiphenylamine	NA	10 U	6.1 U	10 U	4.6 U	4.9 U	5.6 U	5.1 U
Pentachlorophenol	1	**8 U**	**4.9 U**	**8 U**	**3.7 U**	**3.9 U**	**4.5 U**	**4.1 U**
Phenanthrene	NA	2 U	1.2 U	2 U	0.22 J	0.38 J	1.1 U	1 U
Phenol	NA	4 U	2.4 U	4 U	1.9 U	1.9 U	2.2 U	2 U
Pyrene	NA	2 U	1.2 U	2 U	0.93 U	0.97 U	1.1 U	1 U
Pyridine	NA	4 U	2.4 U	4 U	1.9 U	1.9 U	2.2 U	2 U

TABLE 5.13-2
AOC 13 - SEPTIC SYSTEMS AND APPLICATION AREAS: GROUNDWATER ANALYTICAL RESULTS COMPARED TO GROUNDWATER ENFORCEMENT STANDARDS
VERMONT YANKEE
VERNON, VERMONT

Location Name	VT ANR	DP1306	DP1307	DP1308	DP1309	DP1309	DP1310	DP1311
Sample Name	Proposed 2019	GW1306-20190508	GW1307-20190508	GW1308-20190508	GW1309-20190429	GW1309DUP-20190429	GW1310-20190429	GW1311-20190429
Sample Date	Groundwater	05/08/2019	05/08/2019	05/08/2019	04/29/2019	04/29/2019	04/29/2019	04/29/2019
Lab Sample ID	Enforcement	JC87972-5	JC87972-6	JC87972-1	JC87443-6	JC87443-7	JC87443-2	JC87443-5
Total Petroleum Hydrocarbons (ug/L)								
Total Petroleum Hydrocarbons (C10-C28) DRO	NA	83 U	-	255	83 UJ	83 UJ	83 UJ	83 UJ
Total Petroleum Hydrocarbons (C6-C10) GRO	NA	200 U	200 U	200 U	200 U	200 U	200 U	200 U
Inorganic Compounds (ug/L)								
Phosphorus, Dissolved	NA	-	-	-	-	-	-	-
Aluminum, Total	NA	26600	22600	33200	163000 J	88500 J	118000	458000
Antimony, Total	NA	12 U	6 U	12 U	30 U	30 U	60 U	49
Arsenic, Total	10	**23.2**	**15.6**	**16.6**	**37.5**	**22.5**	**36.5**	**95**
Barium, Total	2000	400 U	247	400 U	1000 U	1000 U	1000 U	1960
Beryllium, Total	4	2 U	1.4	2 U	**5 U**	**5 U**	**5 U**	**15.5**
Cadmium, Total	5	**6 U**	3 U	**6 U**	**15 U**	**15 U**	**15 U**	**15 U**
Calcium, Total	NA	54600	50300	42800	94300	102000	66700	173000
Chromium, Total	100	46	62.1	78.4	**244 J**	**129 J**	**198**	**780**
Cobalt, Total	NA	100 U	50 U	100 U	250 U	250 U	250 U	385
Copper, Total	1300	71	61.3	74.6	250	162	208	900
Iron, Total	NA	59200	48400	56600	242000 J	113000 J	191000	754000
Lead, Total	15	**16.8**	15 U	**20.4**	**62.5**	**42.5**	**62**	**190**
Magnesium, Total	NA	19800	13600	19100	77800 J	44600 J	63800	249000
Manganese, Total	300	**2580**	**13700**	**4030**	**3570**	**2750**	**2740**	**13700**
Mercury, Total	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel, Total	100	67.6	68.8	71.8	**287 J**	**148 J**	**209**	**913**
Potassium, Total	NA	20000 U	10000 U	20000 U	50000 U	50000 U	50000 U	83700
Selenium, Total	50	20 U	50 U	20 U	50 U	50 U	50 U	50 U
Silver, Total	NA	20 U	10 U	20 U	50 U	50 U	50 U	50 U
Sodium, Total	NA	58700	210000	20000 U	50000 U	50000 U	50000 U	50000 U
Thallium, Total	2	**20 U**	**50 U**	**20 U**	**50 U**	**50 U**	**50 U**	**50 U**
Vanadium, Total	NA	100 U	100 U	100 U	319	250 U	250 U	918
Zinc, Total	NA	115	103	118	563 J	319 J	427	1700

ABBREVIATIONS AND NOTES:
-: Not Analyzed
J: valued is estimated
J+: valued is estimated with a potential high bias
mS/cm: milliSiemen per centimeter
mv: millivolt
NA: Not Applicable
NTU: Nephelometric Turbidiy Units
RSL: Risk-Based Screening Levels
U: Not detected, value is the laboratory reporting limit
ug/L: microgram per liter
USEPA: United States Environmental Protection Agency
VT ANR: Vermont Agency of Natural Resources

- Volatile and Semi-Volatile analytes detected in at least one sample are reported herein. For a complete list of analytes see the laboratory data sheets.
- Bold values indicate an exceedance of the VT ANR Proposed 2019 Groundwater Enforcement Standard.

TABLE 5.14-1
AOC 14 - STORM WATER OUTFALLS: SEDIMENT ANALYTICAL RESULTS COMPARED TO TEC AND PEC SEDIMENT CRITERIA
VERMONT YANKEE
VERNON, VT

Location Name Sample Name Sample Date Lab Sample ID Sample Depth (bgs)	VT ANR 2019 Proposed TEC	VT ANR 2019 Proposed PEC	SD1401 SD140100 05/16/2019 B3307_16716_DF_001 JC88412-7 0 - 0.5 (ft)	SD1404 SD140400 05/07/2019 B3278_16682_DF_001 JC87876-12 0 - 0.5 (ft)	SD1405 SD140500 05/16/2019 B3307_16716_DF_002 JC88412-8 0 - 0.5 (ft)	SD1406 SD140600 05/16/2019 B3307_16716_DF_003 JC88412-9 0 - 0.5 (ft)
Volatile Organic Compounds (ug/kg)						
1,1,1,2-Tetrachloroethane	NA	NA	2.1 U	1.9 UJ	1.6 U	1.6 U
1,1,1-Trichloroethane	NA	NA	2.1 U	1.9 UJ	1.6 U	1.6 U
1,1,2,2-Tetrachloroethane	NA	NA	2.1 U	1.9 UJ	1.6 U	1.6 U
1,1,2-Trichloroethane	NA	NA	2.1 U	1.9 UJ	1.6 U	1.6 U
1,1-Dichloroethane	NA	NA	1 U	0.94 UJ	0.78 U	0.82 U
1,1-Dichloroethene	NA	NA	1 U	0.94 UJ	0.78 U	0.82 U
1,1-Dichloropropene	NA	NA	2.1 U	1.9 UJ	1.6 U	1.6 U
1,2,3-Trichlorobenzene	NA	NA	5.2 U	4.7 UJ	3.9 U	4.1 U
1,2,3-Trichloropropane	NA	NA	5.2 U	4.7 UJ	3.9 U	4.1 U
1,2,4-Trichlorobenzene	NA	NA	5.2 U	4.7 UJ	3.9 U	4.1 U
1,2,4-Trimethylbenzene	NA	NA	2.1 U	1.9 UJ	1.6 U	1.6 U
1,2-Dibromo-3-chloropropane (DBCP)	NA	NA	2.1 U	1.9 UJ	1.6 U	1.6 U
1,2-Dibromoethane (Ethylene Dibromide)	NA	NA	1 U	0.94 UJ	0.78 U	0.82 U
1,2-Dichlorobenzene	NA	NA	1 U	0.94 UJ	0.78 U	0.82 U
1,2-Dichloroethane	NA	NA	1 U	0.94 UJ	0.78 U	0.82 U
1,2-Dichloropropane	NA	NA	2.1 U	1.9 UJ	1.6 U	1.6 U
1,3,5-Trimethylbenzene	NA	NA	2.1 U	1.9 UJ	1.6 U	1.6 U
1,3-Dichlorobenzene	NA	NA	1 U	0.94 UJ	0.78 U	0.82 U
1,3-Dichloropropane	NA	NA	2.1 U	1.9 UJ	1.6 U	1.6 U
1,4-Dichlorobenzene	NA	NA	1 U	0.94 UJ	0.78 U	0.82 U
2,2-Dichloropropane	NA	NA	2.1 U	1.9 UJ	1.6 U	1.6 U
2-Butanone (Methyl Ethyl Ketone)	NA	NA	10 U	9.4 UJ	7.8 U	8.2 U
2-Chlorotoluene	NA	NA	2.1 U	1.9 UJ	1.6 U	1.6 U
2-Phenylbutane (sec-Butylbenzene)	NA	NA	2.1 U	1.9 UJ	1.6 U	1.6 U
4-Chlorotoluene	NA	NA	2.1 U	1.9 UJ	1.6 U	1.6 U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	NA	NA	5.2 U	4.7 UJ	3.9 U	4.1 U
Acetone	NA	NA	10 U	9.4 UJ	7.8 U	21 U
Benzene	NA	NA	0.52 U	0.47 UJ	0.39 U	0.41 U
Bromobenzene	NA	NA	5.2 U	4.7 UJ	3.9 U	4.1 U
Bromodichloromethane	NA	NA	2.1 U	1.9 UJ	1.6 U	1.6 U
Bromoform	NA	NA	5.2 U	4.7 UJ	3.9 U	4.1 U
Bromomethane (Methyl Bromide)	NA	NA	5.2 U	4.7 UJ	3.9 U	4.1 U
Carbon tetrachloride	NA	NA	2.1 U	1.9 UJ	1.6 U	1.6 U
Chlorobenzene	NA	NA	2.1 U	1.9 UJ	1.6 U	1.6 U
Chlorobromomethane	NA	NA	5.2 U	4.7 UJ	3.9 U	4.1 U
Chloroethane	NA	NA	5.2 U	4.7 UJ	3.9 U	4.1 U
Chloroform (Trichloromethane)	NA	NA	2.1 U	1.9 UJ	1.6 U	1.6 U
Chloromethane (Methyl Chloride)	NA	NA	5.2 U	4.7 UJ	3.9 U	4.1 U
cis-1,2-Dichloroethene	NA	NA	1 U	0.94 UJ	0.78 U	0.82 U
cis-1,3-Dichloropropene	NA	NA	2.1 U	1.9 UJ	1.6 U	1.6 U
Cymene (p-Isopropyltoluene)	NA	NA	2.1 U	1.9 UJ	1.6 U	1.6 U
Dibromochloromethane	NA	NA	2.1 U	1.9 UJ	1.6 U	1.6 U
Dibromomethane	NA	NA	5.2 U	4.7 UJ	3.9 U	4.1 U
Dichlorodifluoromethane (CFC-12)	NA	NA	5.2 U	4.7 UJ	3.9 U	4.1 U
Ethylbenzene	NA	NA	1 U	0.94 UJ	0.78 U	0.82 U
Hexachlorobutadiene	NA	NA	5.2 U	4.7 UJ	3.9 U	4.1 U
Isopropylbenzene (Cumene)	NA	NA	2.1 U	1.9 UJ	1.6 U	1.6 U
m,p-Xylenes	NA	NA	1 U	0.94 UJ	0.78 U	0.82 U
Methyl Tert Butyl Ether	NA	NA	1 U	0.94 UJ	0.78 U	0.82 U
Methylene chloride	NA	NA	5.2 U	4.7 UJ	3.9 U	4.1 U
Naphthalene	176	561	5.2 U	4.7 UJ	3.9 U	4.1 U
n-Butylbenzene	NA	NA	2.1 U	1.9 UJ	1.6 U	1.6 U
n-Propylbenzene	NA	NA	2.1 U	1.9 UJ	1.6 U	1.6 U
o-Xylene	NA	NA	1 U	0.94 UJ	0.78 U	0.82 U
Styrene	NA	NA	2.1 U	1.9 UJ	1.6 U	1.6 U
tert-Butylbenzene	NA	NA	2.1 U	1.9 UJ	1.6 U	1.6 U
Tetrachloroethene	NA	NA	2.1 U	1.9 UJ	1.6 U	1.6 U
Toluene	NA	NA	1 U	0.94 UJ	0.78 U	0.82 U
trans-1,2-Dichloroethene	NA	NA	1 U	0.94 UJ	0.78 U	0.82 U
trans-1,3-Dichloropropene	NA	NA	2.1 U	1.9 UJ	1.6 U	1.6 U
Trichloroethene	NA	NA	1 U	0.94 UJ	0.78 U	0.82 U
Trichlorofluoromethane (CFC-11)	NA	NA	5.2 U	4.7 UJ	3.9 U	4.1 U
Vinyl chloride	NA	NA	2.1 U	1.9 UJ	1.6 U	1.6 U
Xylene (total)	NA	NA	1 U	0.94 UJ	0.78 U	0.82 U

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VERMONT YANKEE
VERNON, VT

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Semi-Volatile Organic Compounds (ug/kg)						
1,2,4-Trichlorobenzene	NA	NA	73 U	70 U	73 U	77 U
1,2-Dichlorobenzene	NA	NA	73 U	70 U	73 U	77 U
1,2-Diphenylhydrazine	NA	NA	73 U	70 U	73 U	77 U
1,3-Dichlorobenzene	NA	NA	73 U	70 U	73 U	77 U
1,4-Dichlorobenzene	NA	NA	73 U	70 U	73 U	77 U
1-Methylnaphthalene	NA	NA	36 U	35 U	36 U	38 U
2,2'-oxybis(1-Chloropropane)	NA	NA	73 U	70 U	73 U	77 U
2,4,5-Trichlorophenol	NA	NA	180 U	170 U	180 U	190 U
2,4,6-Trichlorophenol	NA	NA	180 U	170 U	180 U	190 U
2,4-Dichlorophenol	NA	NA	180 U	170 U	180 U	190 U
2,4-Dimethylphenol	NA	NA	180 U	170 U	180 U	190 U
2,4-Dinitrophenol	NA	NA	180 U	170 U	180 U	190 U
2,4-Dinitrotoluene	NA	NA	36 U	35 U	36 U	38 U
2,6-Dinitrotoluene	NA	NA	36 U	35 U	36 U	38 U
2-Chloronaphthalene	NA	NA	73 U	70 U	73 U	77 U
2-Chlorophenol	NA	NA	73 U	70 U	73 U	77 U
2-Methylnaphthalene	NA	NA	36 U	35 U	36 U	38 U
2-Methylphenol (o-Cresol)	NA	NA	73 U	70 U	73 U	77 U
2-Nitroaniline	NA	NA	180 U	170 U	180 U	190 U
2-Nitrophenol	NA	NA	180 U	170 U	180 U	190 U
3&4-Methylphenol	NA	NA	73 U	70 U	73 U	77 U
3,3'-Dichlorobenzidine	NA	NA	73 U	70 U	73 U	77 U
3-Nitroaniline	NA	NA	180 U	170 U	180 U	190 U
4,6-Dinitro-2-methylphenol	NA	NA	180 U	170 U	180 U	190 U
4-Bromophenyl phenyl ether	NA	NA	73 U	70 U	73 U	77 U
4-Chloro-3-methylphenol	NA	NA	180 U	170 U	180 U	190 U
4-Chloroaniline	NA	NA	180 U	170 U	180 U	190 U
4-Chlorophenyl phenyl ether	NA	NA	73 U	70 U	73 U	77 U
4-Nitroaniline	NA	NA	180 U	170 U	180 U	190 U
4-Nitrophenol	NA	NA	360 U	350 U	360 U	380 U
Acenaphthene	NA	NA	36 U	35 U	36 U	38 U
Acenaphthylene	NA	NA	36 U	35 U	36 U	38 U
Aniline	NA	NA	73 U	70 U	73 U	77 U
Anthracene	57.2	845	36 U	35 U	36 U	38 U
Benzidine	NA	NA	360 U	350 U	360 U	380 U
Benzo(a)anthracene	108	1050	15.9 J	35 U	36 U	38 U
Benzo(a)pyrene	150	1450	36 U	35 U	36 U	38 U
Benzo(b)fluoranthene	NA	NA	18.7 J	35 U	36 U	38 U
Benzo(g,h,i)perylene	NA	NA	36 U	35 U	36 U	38 U
Benzo(k)fluoranthene	NA	NA	36 U	35 U	36 U	38 U
Benzoic acid	NA	NA	730 U	700 U	730 U	770 U
Benzyl Alcohol	NA	NA	73 U	70 U	73 U	77 U
bis(2-Chloroethoxy)methane	NA	NA	73 U	70 U	73 U	77 U
bis(2-Chloroethyl)ether	NA	NA	73 U	70 U	73 U	77 U
bis(2-Ethylhexyl)phthalate	NA	NA	69.7 J	70 U	73 U	77 U
Butyl benzylphthalate	NA	NA	73 U	70 U	73 U	77 U
Carbazole	NA	NA	73 U	70 U	73 U	77 U
Chrysene	166	1290	16.3 J	35 U	36 U	38 U
Dibenz(a,h)anthracene	33	140	**36 U**	**35 U**	**36 U**	**38 U**
Dibenzofuran	NA	NA	73 U	70 U	73 U	77 U
Diethyl phthalate	NA	NA	73 U	70 U	73 U	77 U
Dimethyl phthalate	NA	NA	73 U	70 U	73 U	77 U
Di-n-butylphthalate	NA	NA	73 U	70 U	73 U	77 U
Di-n-octyl phthalate	NA	NA	73 U	70 U	73 U	77 U
Fluoranthene	423	2230	17.6 J	35 U	36 U	38 U
Fluorene	77.4	536	36 U	35 U	36 U	38 U
Hexachlorobenzene	NA	NA	73 U	70 U	73 U	77 U
Hexachlorobutadiene	NA	NA	36 U	35 U	36 U	38 U
Hexachlorocyclopentadiene	NA	NA	360 U	350 U	360 U	380 U
Hexachloroethane	NA	NA	180 U	170 U	180 U	190 U
Indeno(1,2,3-cd)pyrene	NA	NA	36 U	35 U	36 U	38 U
Isophorone	NA	NA	73 U	70 U	73 U	77 U
Naphthalene	176	561	36 U	35 U	36 U	38 U
Nitrobenzene	NA	NA	73 U	70 U	73 U	77 U
N-Nitrosodimethylamine	NA	NA	73 U	70 U	73 U	77 U
N-Nitrosodi-n-propylamine	NA	NA	73 U	70 U	73 U	77 U
N-Nitrosodiphenylamine	NA	NA	180 U	170 U	180 U	190 U
Pentachlorophenol	NA	NA	150 U	140 U	150 U	150 U
Phenanthrene	204	1170	36 U	35 U	36 U	38 U
Phenol	NA	NA	73 U	70 U	73 U	77 U
Pyrene	195	1520	16.2 J	35 U	36 U	38 U
Pyridine	NA	NA	73 U	70 U	73 U	77 U
Total Petroleum Hydrocarbons (mg/kg)						
Total Petroleum Hydrocarbons (C10-C28) DRO	NA	NA	22.1	10 U	9.5 U	11 U
Total Petroleum Hydrocarbons (C6-C10) GRO	NA	NA	22 U	19 UJ	20 U	21 U

TABLE 5.14-1
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VERMONT YANKEE
VERNON, VT

Location Name Sample Name Sample Date Lab Sample ID Sample Depth (bgs)	VT ANR 2019 Proposed TEC	VT ANR 2019 Proposed PEC	SD1401 SD140100 05/16/2019 B3307_16716_DF_001 JC88412-7 0 - 0.5 (ft)	SD1404 SD140400 05/07/2019 B3278_16682_DF_001 JC87876-12 0 - 0.5 (ft)	SD1405 SD140500 05/16/2019 B3307_16716_DF_002 JC88412-8 0 - 0.5 (ft)	SD1406 SD140600 05/16/2019 B3307_16716_DF_003 JC88412-9 0 - 0.5 (ft)
Inorganic Compounds (mg/kg)						
Aluminum	NA	NA	6580	14500	4720	4720
Antimony	NA	NA	2.3 U	2.1 U	2.2 U	2.3 U
Arsenic	9.79	33	4.8	4.2 U	6.3	3
Barium	NA	NA	23 U	49.7	22 U	23 U
Beryllium	NA	NA	0.23 U	0.21 U	0.22 U	0.23 U
Cadmium	0.99	4.98	0.58 U	**1.8**	0.55 U	0.58 U
Calcium	NA	NA	1080	8340	632	954
Chromium	43.4	111	11.6	39.3	9.1	8.7
Cobalt	NA	NA	5.8 U	18.7	5.5 U	7.3
Copper	31.6	149	11.6	**60.4**	27.1	5.7
Iron	NA	NA	15700	31900	24000	8980
Lead	35.8	128	6.6	15.8	6.9	3.3
Magnesium	NA	NA	3190	10800	2190	1920
Manganese	NA	NA	285	669	163	886
Mercury	0.18	1.06	0.031 U	0.031 U	0.029 U	0.026 U
Nickel	22.7	48.6	14	**36.4**	15.1	10.6
Potassium	NA	NA	1200 U	1990	1100 U	1200 U
Selenium	NA	NA	2.3 U	4.2 U	4.4 U	2.3 U
Silver	NA	NA	0.58 U	1 U	1.1 U	0.58 U
Sodium	NA	NA	1200 U	1000 U	1100 U	1200 U
Thallium	NA	NA	1.2 U	2.1 U	2.2 U	1.2 U
Vanadium	NA	NA	15.7	49.2	10.1	10
Zinc	121	459	119	**391**	**292**	20.6
PCBs (ug/kg)						
Aroclor-1016 (PCB-1016)	NA	NA	34 U	34 U	33 U	37 U
Aroclor-1221 (PCB-1221)	NA	NA	34 U	34 U	33 U	37 U
Aroclor-1232 (PCB-1232)	NA	NA	34 U	34 U	33 U	37 U
Aroclor-1242 (PCB-1242)	NA	NA	34 U	34 U	33 U	37 U
Aroclor-1248 (PCB-1248)	NA	NA	34 U	34 U	33 U	37 U
Aroclor-1254 (PCB-1254)	NA	NA	34 U	34 U	33 U	37 U
Aroclor-1260 (PCB-1260)	NA	NA	34 U	34 U	33 U	37 U
Aroclor-1262 (PCB-1262)	NA	NA	34 U	34 U	33 U	37 U
Aroclor-1268 (PCB-1268)	NA	NA	34 U	34 U	33 U	37 U
SUM of PCBs	NA	NA	ND	ND	ND	ND
Other						
Total Solids (%)	NA	NA	87.6	92	90.7	86.1
Dioxins/Furans (pg/g)						
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	NA	NA	3.88 U	1.46 J	4.08 U	4.2 U
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	NA	NA	3.88 U	14.1	31.7	4.2 U
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	NA	NA	1.94 U	0.823 J	2.04 U	2.1 U
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	NA	NA	1.94 U	1.73	5.1	2.1 U
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	NA	NA	0.0544 U	0.0771 U	0.0572 U	0.0588 U
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	NA	NA	0.0964 J	0.0492 J	0.0826 J	0.0925 J
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	NA	NA	0.0863 J	0.059 U	0.139 J	0.101 U
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	NA	NA	0.0913 J	0.0339 J	0.0995 J	0.0376 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	NA	NA	0.126 J	0.057 U	0.331 J	0.135 J
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	NA	NA	0.059 U	0.0433 U	0.0619 U	0.0489 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	NA	NA	1.94 U	0.133 J	2.04 U	2.1 U
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	NA	NA	0.0413 J	0.0488 U	0.0556 U	0.0634 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	NA	NA	0.0613 U	0.137 U	0.069 U	0.0913 U
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	NA	NA	0.117 J	0.0349 U	0.0572 U	0.0626 J
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	NA	NA	0.0897 J	0.0525 U	0.059 U	0.0633 U
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	NA	NA	0.0509 U	0.0436 U	0.0751 U	0.0826 U
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	NA	NA	0.114 U	0.0725 U	0.13 U	0.181 U
Total Heptachlorodibenzofuran (HpCDF)	NA	NA	1.94 U	1.56 J	2.45	2.1 U
Total Heptachlorodibenzo-p-dioxin (HpCDD)	NA	NA	3.31	3.09	8.59	3.24 J
Total Hexachlorodibenzofuran (HxCDF)	NA	NA	1.08 J	0.804 J	1.45 J	0.681 J
Total Hexachlorodibenzo-p-dioxin (HxCDD), Mixture	NA	NA	1.94 U	0.632 J	2.04 U	2.1 U
Total Pentachlorodibenzofuran (PeCDF)	NA	NA	0.861 J	0.151	0.266 J	0.438 J
Total Pentachlorodibenzo-p-dioxin (PeCDD)	NA	NA	0.0855 J	0.137 U	0.069 U	0.0913 U
Total Tetrachlorodibenzofuran (TCDF)	NA	NA	0.0509 U	0.0436 U	0.101 J	0.118 J
Total Tetrachlorodibenzo-p-dioxin (TCDD)	NA	NA	0.114 U	0.0725 U	0.13 U	0.181 U
Herbicides (ug/kg)						
2,4,5-T	NA	NA	3.5 U	3.6 U	3.5 U	3.8 U
2,4,5-TP (Silvex)	NA	NA	3.5 U	3.6 U	3.5 U	3.8 U
2,4-Dichlorophenoxyacetic acid (2,4-D)	NA	NA	18 U	18 U	17 U	19 U
Dalapon	NA	NA	3.5 U	3.6 U	3.5 U	3.8 U
Dichloroprop	NA	NA	18 U	18 U	17 U	19 U
Dinoseb	NA	NA	18 U	18 U	17 U	19 U

TABLE 5.14-1
AOC 14 - STORM WATER OUTFALLS: SEDIMENT ANALYTICAL RESULTS COMPARED TO TEC AND PEC SEDIMENT CRITERIA
VERMONT YANKEE
VERNON, VT

Location Name Sample Name Sample Date Lab Sample ID Sample Depth (bgs)	VT ANR 2019 Proposed TEC	VT ANR 2019 Proposed PEC	SD1401 SD140100 05/16/2019 B3307_16716_DF_001 JC88412-7 0 - 0.5 (ft)	SD1404 SD140400 05/07/2019 B3278_16682_DF_001 JC87876-12 0 - 0.5 (ft)	SD1405 SD140500 05/16/2019 B3307_16716_DF_002 JC88412-8 0 - 0.5 (ft)	SD1406 SD140600 05/16/2019 B3307_16716_DF_003 JC88412-9 0 - 0.5 (ft)
Pesticides (ug/kg)						
4,4'-DDD	4.88	28	0.68 U	0.7 U	0.66 U	0.74 U
4,4'-DDE	3.16	31.3	0.68 U	0.7 U	0.66 U	0.74 U
4,4'-DDT	4.16	62.9	0.68 U	0.7 U	0.66 U	0.74 U
Aldrin	NA	NA	0.68 U	0.7 U	0.66 U	0.74 U
alpha-BHC	NA	NA	0.68 U	0.7 U	0.66 U	0.74 U
alpha-Chlordane	NA	NA	0.68 U	0.7 U	0.66 U	0.74 U
beta-BHC	NA	NA	0.68 U	0.7 U	0.66 U	0.74 U
delta-BHC	NA	NA	0.68 U	0.7 U	0.66 U	0.74 U
Dieldrin	1.9	61.8	0.68 U	0.7 U	0.66 U	0.74 U
Endosulfan I	NA	NA	0.68 U	0.7 U	0.66 U	0.74 U
Endosulfan II	NA	NA	0.68 U	0.7 U	0.66 U	0.74 U
Endosulfan sulfate	NA	NA	0.68 U	0.7 U	0.66 U	0.74 U
Endrin	2.22	207	0.68 U	0.7 U	0.66 U	0.74 U
Endrin aldehyde	NA	NA	0.68 U	0.7 U	0.66 U	0.74 U
Endrin ketone	NA	NA	0.68 U	0.7 U	0.66 U	0.74 U
gamma-BHC (Lindane)	2.37	4.99	0.68 U	0.7 U	0.66 U	0.74 U
gamma-Chlordane	NA	NA	0.68 U	0.7 U	0.66 U	0.74 U
Heptachlor	NA	NA	0.68 U	0.7 U	0.66 U	0.74 U
Heptachlor epoxide	2.47	16	0.68 U	0.7 U	0.66 U	0.74 U
Methoxychlor	NA	NA	1.4 U	1.4 U	1.3 U	1.5 U
Toxaphene	NA	NA	17 U	18 U	16 U	18 U

ABBREVIATIONS AND NOTES:
-: Not Analyzed
J: value is estimated
mg/kg: milligram per kilogram
NA: Not Applicable
pg/g: picogram per gram
U: Not detected, value is the laboratory reporting limit
ug/kg: microgram per kilogram
VT ANR: Vermont Agency of Natural Resources
- Volatile and Semi-Volatile analytes detected in at least one sample are reported herein. For a complete list of analytes see the laboratory data sheets.
- **Bold** values indicate an exceedance of the Proposed 2019 VT ANR TEC Sediment value.
- *Italicized* values indicate an exceedance of the Proposed 2019 VT ANR PEC Sediment value.

TABLE 5.15-1
AOC 15 - COOLING TOWER AREAS: SOIL ANALYTICAL RESULTS COMPARED TO RESIDENTIAL AND NON-RESIDENTIAL SOIL CRITERIA
VERMONT YANKEE
VERNON, VERMONT

Location Name / Sample Name / Sample Date / Lab Sample ID / Sample Depth (bgs)	VT ANR 2019 Proposed Residential Soil	VT ANR 2019 Proposed Non-Residential Soil	USEPA RSL Residential Soil HI = 1.0 May 2019	USEPA RSL Industrial Soil HI = 1.0 May 2019	DP1501 DP150101 04/26/2019 JC87123-1 0 - 1 (ft)	DP1501 DP150125 04/26/2019 JC87123-2 25 - 26.5 (ft)	DP1502 DP150201 04/26/2019 JC87123-3 0 - 1 (ft)	DP1502 DP150226 04/26/2019 JC87123-4 26 - 27 (ft)	DP1503 DP150301 04/25/2019 JC87123-5 0 - 1 (ft)	DP1503 DP150310 04/25/2019 JC87123-6 10 - 11.5 (ft)	DP1504 DP150401 04/25/2019 JC87123-7 0 - 1 (ft)	DP1504 DP150415 04/25/2019 JC87123-8 15 - 16 (ft)	DP1505 DP150501 04/25/2019 JC87123-9 0 - 1 (ft)	DP1505 DP150514 04/25/2019 JC87123-10 14 - 15 (ft)	DP1506 DP150601 04/26/2019 JC87123-11 0 - 1 (ft)	DP1506 DP150623 04/26/2019 JC87123-13 23 - 24 (ft)	DP1507 DP150701 04/26/2019 JC87123-14 0 - 1 (ft)	DP1507 DP150701 DUP 04/26/2019 JC87123-18 0 - 1 (ft)	DP1507 DP150728 04/26/2019 JC87123-15 28 - 29 (ft)	DP1508 DP150801 04/26/2019 JC87123-16 0 - 1 (ft)	DP1508 DP150826 04/26/2019 JC87123-17 26 - 27 (ft)	SP1501 SP150100 05/17/2019 JC88412-10 0 - 0.5 (ft)	SP1501 SP150100DUP 05/17/2019 JC88412-11 0 - 0.5 (ft)	SP1502 SP150200 05/17/2019 JC88412-12 0 - 0.5 (ft)
Volatile Organic Compounds (mg/kg)																								
1,1,1,2-Tetrachloroethane	1.3	8	2	8.8	0.0026 U	0.0016 U	0.0032 U	0.0017 U	0.0024 U	0.0022 U	0.0023 U	0.0015 U	0.0021 U	0.0021 U	0.0019 U	0.0022 U	0.0023 U	0.0024 U	0.0017 U	0.0024 U	0.0016 U	0.0032 U	0.0038 U	0.0029 U
1,1,1-Trichloroethane	NA	NA	8100	36000	0.0026 U	0.0016 U	0.0032 U	0.0017 U	0.0024 U	0.0022 U	0.0023 U	0.0015 U	0.0021 U	0.0021 U	0.0019 U	0.0022 U	0.0023 U	0.0024 U	0.0017 U	0.0024 U	0.0016 U	0.0032 U	0.0038 U	0.0029 U
1,1,2,2-Tetrachloroethane	NA	NA	0.6	2.7	0.0026 U	0.0016 U	0.0032 U	0.0017 U	0.0024 U	0.0022 U	0.0023 U	0.0015 U	0.0021 U	0.0021 U	0.0019 U	0.0022 U	0.0023 U	0.0024 U	0.0017 U	0.0024 U	0.0016 U	0.0032 U	0.0038 U	0.0029 U
1,1,2-Trichloroethane	NA	NA	1.1	5	0.0026 U	0.0016 U	0.0032 U	0.0017 U	0.0024 U	0.0022 U	0.0023 U	0.0015 U	0.0021 U	0.0021 U	0.0019 U	0.0022 U	0.0023 U	0.0024 U	0.0017 U	0.0024 U	0.0016 U	0.0032 U	0.0038 U	0.0029 U
1,1-Dichloroethane	2.1	13	3.6	16	0.0013 U	0.00082 U	0.0016 U	0.00085 U	0.0012 U	0.0011 U	0.0012 U	0.00075 U	0.001 U	0.001 U	0.00095 U	0.0011 U	0.0012 U	0.0012 U	0.00084 U	0.0012 U	0.00082 U	0.0016 U	0.0019 U	0.0014 U
1,1-Dichloroethene	NA	NA	230	1000	0.0013 U	0.00082 U	0.0016 U	0.00085 U	0.0012 U	0.0011 U	0.0012 U	0.00075 U	0.001 U	0.001 U	0.00095 U	0.0011 U	0.0012 U	0.0012 U	0.00084 U	0.0012 U	0.00082 U	0.0016 U	0.0019 U	0.0014 U
1,1-Dichloropropene	NA	NA	NA	NA	0.0026 U	0.0016 U	0.0032 U	0.0017 U	0.0024 U	0.0022 U	0.0023 U	0.0015 U	0.0021 U	0.0021 U	0.0019 U	0.0022 U	0.0023 U	0.0024 U	0.0017 U	0.0024 U	0.0016 U	0.0032 U	0.0038 U	0.0029 U
1,2,3-Trichlorobenzene	NA	NA	63	930	0.0065 U	0.0041 U	0.0081 U	0.0042 U	0.0061 U	0.0056 U	0.0058 U	0.0037 U	0.0052 U	0.0052 U	0.0047 U	0.0054 U	0.0058 U	0.006 U	0.0042 U	0.006 U	0.0041 U	0.008 U	0.0095 U	0.0072 U
1,2,3-Trichloropropane	0.00311	0.07	0.0051	0.11	**0.0065 U**	**0.0041 U**	**0.0081 U**	**0.0042 U**	**0.0061 U**	**0.0056 U**	**0.0058 U**	**0.0037 U**	**0.0052 U**	**0.0052 U**	**0.0047 U**	**0.0054 U**	**0.0058 U**	**0.006 U**	**0.0042 U**	**0.006 U**	**0.0041 U**	**0.008 U**	**0.0095 U**	**0.0072 U**
1,2,4-Trichlorobenzene	NA	NA	24	110	0.0065 U	0.0041 U	0.0081 U	0.0042 U	0.0061 U	0.0056 U	0.0058 U	0.0037 U	0.0052 U	0.0052 U	0.0047 U	0.0054 U	0.0058 U	0.006 U	0.0042 U	0.006 U	0.0041 U	0.008 U	0.0095 U	0.0072 U
1,2,4-Trimethylbenzene	144	177	300	1800	0.0026 U	0.0016 U	0.0032 U	0.0017 U	0.0024 U	0.0022 U	0.0023 U	0.0015 U	0.0021 U	0.0021 U	0.0019 U	0.0022 U	0.0023 U	0.0024 U	0.0017 U	0.0024 U	0.0016 U	0.0032 U	0.0038 U	0.0029 U
1,2-Dibromo-3-chloropropane (DBCP)	0.01	0.06	0.0053	0.064	0.0026 U	0.0016 U	0.0032 U	0.0017 U	0.0024 U	0.0022 U	0.0023 U	0.0015 U	0.0021 U	0.0021 U	0.0019 U	0.0022 U	0.0023 U	0.0024 U	0.0017 U	0.0024 U	0.0016 U	0.0032 U	0.0038 U	0.0029 U
1,2-Dibromoethane (Ethylene Dibromide)	0.02	0.14	0.036	0.16	0.0013 U	0.00082 U	0.0016 U	0.00085 U	0.0012 U	0.0011 U	0.0012 U	0.00075 U	0.001 U	0.001 U	0.00095 U	0.0011 U	0.0012 U	0.0012 U	0.00084 U	0.0012 U	0.00082 U	0.0016 U	0.0019 U	0.0014 U
1,2-Dichlorobenzene	NA	NA	1800	9300	0.0013 U	0.00082 U	0.0016 U	0.00085 U	0.0012 U	0.0011 U	0.0012 U	0.00075 U	0.001 U	0.001 U	0.00095 U	0.0011 U	0.0012 U	0.0012 U	0.00084 U	0.0012 U	0.00082 U	0.0016 U	0.0019 U	0.0014 U
1,2-Dichloroethane	0.29	1.7	0.46	2	0.0013 U	0.00082 U	0.0016 U	0.00085 U	0.0012 U	0.0011 U	0.0012 U	0.00075 U	0.001 U	0.001 U	0.00095 U	0.0011 U	0.0012 U	0.0012 U	0.00084 U	0.0012 U	0.00082 U	0.0016 U	0.0019 U	0.0014 U
1,2-Dichloropropane	1.5	9.1	2.5	11	0.0026 U	0.0016 U	0.0032 U	0.0017 U	0.0024 U	0.0022 U	0.0023 U	0.0015 U	0.0021 U	0.0021 U	0.0019 U	0.0022 U	0.0023 U	0.0024 U	0.0017 U	0.0024 U	0.0016 U	0.0032 U	0.0038 U	0.0029 U
1,3,5-Trimethylbenzene	144	177	270	1500	0.0026 U	0.0016 U	0.0032 U	0.0017 U	0.0024 U	0.0022 U	0.0023 U	0.0015 U	0.0021 U	0.0021 U	0.0019 U	0.0022 U	0.0023 U	0.0024 U	0.0017 U	0.0024 U	0.0016 U	0.0032 U	0.0038 U	0.0029 U
1,3-Dichlorobenzene	NA	NA	NA	NA	0.0013 U	0.00082 U	0.0016 U	0.00085 U	0.0012 U	0.0011 U	0.0012 U	0.00075 U	0.001 U	0.001 U	0.00095 U	0.0011 U	0.0012 U	0.0012 U	0.00084 U	0.0012 U	0.00082 U	0.0016 U	0.0019 U	0.0014 U
1,3-Dichloropropane	NA	NA	1600	23000	0.0026 U	0.0016 U	0.0032 U	0.0017 U	0.0024 U	0.0022 U	0.0023 U	0.0015 U	0.0021 U	0.0021 U	0.0019 U	0.0022 U	0.0023 U	0.0024 U	0.0017 U	0.0024 U	0.0016 U	0.0032 U	0.0038 U	0.0029 U
1,4-Dichlorobenzene	NA	NA	2.6	11	0.0013 U	0.00082 U	0.0016 U	0.00085 U	0.0012 U	0.0011 U	0.0012 U	0.00075 U	0.001 U	0.001 U	0.00095 U	0.0011 U	0.0012 U	0.0012 U	0.00084 U	0.0012 U	0.00082 U	0.0016 U	0.0019 U	0.0014 U
2,2-Dichloropropane	NA	NA	NA	NA	0.0026 U	0.0016 U	0.0032 U	0.0017 U	0.0024 U	0.0022 U	0.0023 U	0.0015 U	0.0021 U	0.0021 U	0.0019 U	0.0022 U	0.0023 U	0.0024 U	0.0017 U	0.0024 U	0.0016 U	0.0032 U	0.0038 U	0.0029 U
2-Butanone (Methyl Ethyl Ketone)	16952	26991	27000	190000	0.013 U	0.0082 U	0.016 U	0.0085 U	0.012 U	0.011 U	0.012 U	0.0075 U	0.01 U	0.01 U	0.0095 U	0.011 U	0.012 U	0.012 U	0.0084 U	0.012 U	0.0082 U	0.016 U	0.019 U	0.014 U
2-Chlorotoluene	NA	NA	1600	23000	0.0026 U	0.0016 U	0.0032 U	0.0017 U	0.0024 U	0.0022 U	0.0023 U	0.0015 U	0.0021 U	0.0021 U	0.0019 U	0.0022 U	0.0023 U	0.0024 U	0.0017 U	0.0024 U	0.0016 U	0.0032 U	0.0038 U	0.0029 U
2-Phenylbutane (sec-Butylbenzene)	7009	102200	7800	120000	0.0026 U	0.0016 U	0.0032 U	0.0017 U	0.0024 U	0.0022 U	0.0023 U	0.0015 U	0.0021 U	0.0021 U	0.0019 U	0.0022 U	0.0023 U	0.0024 U	0.0017 U	0.0024 U	0.0016 U	0.0032 U	0.0038 U	0.0029 U
4-Chlorotoluene	NA	NA	1600	23000	0.0026 U	0.0016 U	0.0032 U	0.0017 U	0.0024 U	0.0022 U	0.0023 U	0.0015 U	0.0021 U	0.0021 U	0.0019 U	0.0022 U	0.0023 U	0.0024 U	0.0017 U	0.0024 U	0.0016 U	0.0032 U	0.0038 U	0.0029 U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	NA	NA	33000	140000	0.0065 U	0.0041 U	0.0081 U	0.0042 U	0.0061 U	0.0056 U	0.0058 U	0.0037 U	0.0052 U	0.0052 U	0.0047 U	0.0054 U	0.0058 U	0.006 U	0.0042 U	0.006 U	0.0041 U	0.008 U	0.0095 U	0.0072 U
Acetone	40609	100028	61000	670000	0.013 U	0.0133 U	0.032 J+	0.0085 U	0.012 U	0.011 U	0.0219 U	0.0171 U	0.0523 J+	0.013 U	0.0175 U	0.0121 U	0.012 U	0.0213 U	0.009 U	0.0128 U	0.0326 J+	0.016 U	0.019 U	0.014 U
Benzene	0.7	4.2	1.2	5.1	0.00065 U	0.00041 U	0.00081 U	0.00042 U	0.00061 U	0.00056 U	0.00058 U	0.00037 U	0.00052 U	0.00052 U	0.00047 U	0.00054 U	0.00058 U	0.0006 U	0.00042 U	0.0006 U	0.00041 U	0.0008 U	0.00095 U	0.00072 U
Bromobenzene	NA	NA	290	1800	0.0065 U	0.0041 U	0.0081 U	0.0042 U	0.0061 U	0.0056 U	0.0058 U	0.0037 U	0.0052 U	0.0052 U	0.0047 U	0.0054 U	0.0058 U	0.006 U	0.0042 U	0.006 U	0.0041 U	0.008 U	0.0095 U	0.0072 U
Bromodichloromethane	NA	NA	0.29	1.3	0.0026 U	0.0016 U	0.0032 U	0.0017 U	0.0024 U	0.0022 U	0.0023 U	0.0015 U	0.0021 U	0.0021 U	0.0019 U	0.0022 U	0.0023 U	0.0024 U	0.0017 U	0.0024 U	0.0016 U	0.0032 U	0.0038 U	0.0029 U
Bromoform	NA	NA	19	86	0.0065 U	0.0041 U	0.0081 U	0.0042 U	0.0061 U	0.0056 U	0.0058 U	0.0037 U	0.0052 U	0.0052 U	0.0047 U	0.0054 U	0.0058 U	0.006 U	0.0042 U	0.006 U	0.0041 U	0.008 U	0.0095 U	0.0072 U
Bromomethane (Methyl Bromide)	NA	NA	6.8	30	0.0065 U	0.0041 U	0.0081 U	0.0042 U	0.0061 U	0.0056 U	0.0058 U	0.0037 U	0.0052 U	0.0052 U	0.0047 U	0.0054 U	0.0058 U	0.006 U	0.0042 U	0.006 U	0.0041 U	0.008 U	0.0095 U	0.0072 U
Carbon tetrachloride	0.37	2.2	0.65	2.9	0.0026 U	0.0016 U	0.0032 U	0.0017 U	0.0024 U	0.0022 U	0.0023 U	0.0015 U	0.0021 U	0.0021 U	0.0019 U	0.0022 U	0.0023 U	0.0024 U	0.0017 U	0.0024 U	0.0016 U	0.0032 U	0.0038 U	0.0029 U
Chlorobenzene	414	726	280	1300	0.0026 U	0.0016 U	0.0032 U	0.0017 U	0.0024 U	0.0022 U	0.0023 U	0.0015 U	0.0021 U	0.0021 U	0.0019 U	0.0022 U	0.0023 U	0.0024 U	0.0017 U	0.0024 U	0.0016 U	0.0032 U	0.0038 U	0.0029 U
Chlorobromomethane	193	597	150	630	0.0065 U	0.0041 U	0.0081 U	0.0042 U	0.0061 U	0.0056 U	0.0058 U	0.0037 U	0.0052 U	0.0052 U	0.0047 U	0.0054 U	0.0058 U	0.006 U	0.0042 U	0.006 U	0.0041 U	0.008 U	0.0095 U	0.0072 U
Chloroethane	NA	NA	14000	57000	0.0065 U	0.0041 U	0.0081 U	0.0042 U	0.0061 U	0.0056 U	0.0058 U	0.0037 U	0.0052 U	0.0052 U	0.0047 U	0.0054 U	0.0058 U	0.006 U	0.0042 U	0.006 U	0.0041 U	0.008 U	0.0095 U	0.0072 U
Chloroform (Trichloromethane)	NA	NA	0.32	1.4	0.0026 U	0.0016 U	0.0032 U	0.0017 U	0.0024 U	0.0022 U	0.0023 U	0.0015 U	0.0021 U	0.0021 U	0.0019 U	0.0022 U	0.0023 U	0.0024 U	0.0017 U	0.0024 U	0.0016 U	0.0032 U	0.0038 U	0.0029 U
Chloromethane (Methyl Chloride)	NA	NA	110	460	0.0065 U	0.0041 U	0.0081 U	0.0042 U	0.0061 U	0.0056 U	0.0058 U	0.0037 U	0.0052 U	0.0052 U	0.0047 U	0.0054 U	0.0058 U	0.006 U	0.0042 U	0.006 U	0.0041 U	0.008 U	0.0095 U	0.0072 U
cis-1,2-Dichloroethene	140	1814	160	2300	0.0013 U	0.00082 U	0.0016 U	0.00085 U	0.0012 U	0.0011 U	0.0012 U	0.00075 U	0.001 U	0.001 U	0.00095 U	0.0011 U	0.0012 U	0.0012 U	0.00084 U	0.0012 U	0.00082 U	0.0016 U	0.0019 U	0.0014 U
cis-1,3-Dichloropropene	NA	NA	NA	NA	0.0026 U	0.0016 U	0.0032 U	0.0017 U	0.0024 U	0.0022 U	0.0023 U	0.0015 U	0.0021 U	0.0021 U	0.0019 U	0.0022 U	0.0023 U	0.0024 U	0.0017 U	0.0024 U	0.0016 U	0.0032 U	0.0038 U	0.0029 U
Cymene (p-Isopropyltoluene)	NA	NA	NA	NA	0.0026 U	0.0016 U	0.0032 U	0.0017 U	0.0024 U	0.0022 U	0.0023 U	0.0015 U	0.0021 U	0.0021 U	0.0019 U	0.0022 U	0.0023 U	0.0024 U	0.0017 U	0.0024 U	0.0016 U	0.0032 U	0.0038 U	0.0029 U
Dibromochloromethane	NA	NA	8.3	39	0.0026 U	0.0016 U	0.0032 U	0.0017 U	0.0024 U	0.0022 U	0.0023 U	0.0015 U	0.0021 U	0.0021 U	0.0019 U	0.0022 U	0.0023 U	0.0024 U	0.0017 U	0.0024 U	0.0016 U	0.0032 U	0.0038 U	0.0029 U
Dibromomethane	NA	NA	24	99	0.0065 U	0.0041 U	0.0081 U	0.0042 U	0.0061 U	0.0056 U	0.0058 U	0.0037 U	0.0052 U	0.0052 U	0.0047 U	0.0054 U	0.0058 U	0.006 U	0.0042 U	0.006 U	0.0041 U	0.008 U	0.0095 U	0.0072 U
Dichlorodifluoromethane (CFC-12)	NA	NA	87	370	0.0065 U	0.0041 U	0.0081 U	0.0042 U	0.0061 U	0.0056 U	0.0058 U	0.0037 U	0.0052 U	0.0052 U	0.0047 U	0.0054 U	0.0058 U	0.006 U	0.0042 U	0.006 U	0.0041 U	0.008 U	0.0095 U	0.0072 U
Ethylbenzene	3.7	22	5.8	25	0.0013 U	0.00082 U	0.0016 U	0.00085 U	0.0012 U	0.0011 U	0.0012 U	0.00075 U	0.001 U	0.001 U	0.00095 U	0.0011 U	0.0012 U	0.0012 U	0.00084 U	0.0012 U	0.00082 U	0.0016 U	0.0019 U	0.0014 U
Hexachlorobutadiene	NA	NA	1.2	5.3	0.0065 U	0.0041 U	0.0081 U	0.0042 U	0.0061 U	0.0056 U	0.0058 U	0.0037 U	0.0052 U	0.0052 U	0.0047 U	0.0054 U	0.0058 U	0.006 U	0.0042 U	0.006 U	0.0041 U	0.008 U	0.0095 U	0.0072 U
Isopropylbenzene (Cumene)	256	264	1900	9900	0.0026 U	0.0016 U	0.0032 U	0.0017 U	0.0024 U	0.0022 U	0.0023 U	0.0015 U	0.0021 U	0.0021 U	0.0019 U	0.0022 U	0.0023 U	0.0024 U	0.0017 U	0.0024 U	0.0016 U	0.0032 U	0.0038 U	0.0029 U
m,p-Xylenes	NA	NA	NA	NA	0.0013 U	0.00082 U	0.0016 U	0.00085 U	0.0012 U	0.0011 U	0.0012 U	0.00075 U	0.001 U	0.001 U	0.00095 U	0.0011 U	0.0012 U	0.0012 U	0.00084 U	0.0012 U	0.00082 U	0.0016 U	0.0019 U	0.0014 U
Methyl Tert Butyl Ether	649	4464	47	210	0.0013 U	0.00082 U	0.0016 U	0.00085 U	0.0012 U	0.0011 U	0.0012 U	0.00075 U	0.001 U	0.001 U	0.00095 U	0.0011 U	0.0012 U	0.0012 U	0.00084 U	0.0012 U	0.00082 U	0.0016 U	0.0019 U	0.0014 U
Methylene chloride	NA	NA	57	1000	0.0065 U	0.0041 U	0.0081 U	0.0042 U	0.0061 U	0.0056 U	0.0058 U	0.0037 U	0.0052 U	0.0052 U	0.0047 U	0.0054 U	0.0058 U	0.006 U	0.0042 U	0.006 U	0.0041 U	0.008 U	0.0095 U	0.0072 U
Naphthalene	2.7	16	3.8	17	0.0065 U	0.0041 U	0.0081 U	0.0042 U	0.0061 U	0.0056 U	0.0058 U	0.0037 U	0.0052 U	0.0052 U	0.0047 U	0.0054 U	0.0058 U	0.006 U	0.0042 U	0.006 U	0.0041 U	0.008 U	0.0095 U	0.0072 U
n-Butylbenzene	3504	51100	3900	58000	0.0026 U	0.0016 U	0.0032 U	0.0017 U	0.0024 U	0.0022 U	0.0023 U	0.0015 U	0.0021 U	0.0021 U	0.0019 U	0.0022 U	0.0023 U	0.0024 U	0.0017 U	0.0024 U	0.0016 U	0.0032 U	0.0038 U	0.0029 U
n-Propylbenzene	253	261	3800	24000	0.0026 U	0.0016 U	0.0032 U	0.0017 U	0.0024 U	0.0022 U	0.0023 U	0.0015 U	0.0021 U	0.0021 U	0.0019 U	0.0022 U	0.0023 U	0.0024 U	0.0017 U	0.0024 U	0.0016 U	0.0032 U	0.0038 U	0.0029 U
o-Xylene	NA	NA	650	2800	0.0013 U	0.00082 U	0.0016 U	0.00085 U	0.0012 U	0.0011 U	0.0012 U	0.00075 U	0.001 U	0.001 U	0.00095 U	0.0011 U	0.0012 U	0.0012 U	0.00084 U	0.0012 U	0.00082 U	0.0016 U	0.0019 U	0.0014 U
Styrene	NA	NA	6000	35000	0.0026 U	0.0016 U	0.0032 U	0.0017 U	0.0024 U	0.0022 U	0.0023 U	0.0015 U	0.0021 U	0.0021 U	0.0019 U	0.0022 U	0.0023 U	0.0024 U	0.0017 U	0.0024 U	0.0016 U	0.0032 U	0.0038 U	0.0029 U
tert-Butylbenzene	7009	102200	7800	120000	0.0026 U	0.0016 U	0.0032 U	0.0017 U	0.0024 U	0.0022 U	0.0023 U	0.0015 U	0.0021 U	0.0021 U	0.0019 U	0.0022 U	0.0023 U	0.0024 U	0.0017 U	0.0024 U	0.0016 U	0.0032 U	0.0038 U	0.0029 U
Tetrachloroethene	2.4	14	24	100	0.0026 U	0.0016 U	0.0032 U	0.0017 U	0.0024 U	0.0022 U	0.0023 U	0.0015 U	0.0021 U	0.0021 U	0.0019 U	0.0022 U	0.0023 U	0.0024 U	0.0017 U	0.0024 U	0.0016 U	0.0032 U	0.0038 U	0.0029 U
Toluene	706	798	4900	47000	0.0013 U	0.00082 U	0.0016 U	0.00085 U	0.0012 U	0.0011 U	0.00044 J	0.00075 U	0.001 U	0.001 U	0.00095 U	0.0011 U	0.0012 U	0.0012 U	0.00084 U	0.0012 U	0.00082 U	0.0016 U	0.0019 U	0.0014 U
trans-1,2-Dichloroethene	1402	18137	1600	23000	0.0013 U	0.00082 U	0.0016 U	0.00085 U	0.0012 U	0.0011 U	0.0012 U	0.00075 U	0.001 U	0.001 U	0.00095 U	0.0011 U	0.0012 U	0.0012 U	0.00084 U	0.0012 U	0.00082 U	0.0016 U	0.0019 U	0.0014 U
trans-1,3-Dichloropropene	NA	NA	NA	NA	0.0026 U	0.0016 U	0.0032 U	0.0017 U	0.0024 U	0.0022 U	0.0023 U	0.0015 U	0.0021 U	0.0021 U	0.0019 U	0.0022 U	0.0023 U	0.0024 U	0.0017 U	0.0024 U	0.0016 U	0.0032 U	0.0038 U	0.0029 U
Trichloroethene	0.68	6.5	0.94	6	0.0013 U	0.00082 U	0.0016 U	0.00085 U	0.0012 U	0.0011 U	0.0012 U	0.00075 U	0.001 U	0.001 U	0.00095 U	0.0011 U	0.0012 U	0.0012 U	0.00084 U	0.0012 U	0.00082 U	0.0016 U	0.0019 U	0.0014 U
Trichlorofluoromethane (CFC-11)	NA	NA	23000	350000	0.0065 U	0.0041 U	0.0081 U	0.0042 U	0.0061 U	0.0056 U	0.0058 U	0.0037 U	0.0052 U	0.0052 U	0.0047 U	0.0054 U	0.0058 U	0.006 U	0.0042 U	0.006 U	0.0041 U	0.008 U	0.0095 U	0.0072 U
Vinyl chloride	0.1	0.59	0.059	1.7	0.0026 U	0.0016 U	0.0032 U	0.0017 U	0.0024 U	0.0022 U	0.0023 U	0.0015 U	0.0021 U	0.0021 U	0.0019 U	0.0022 U	0.0023 U	0.0024 U	0.0017 U	0.0024 U	0.0016 U	0.0032 U	0.0038 U	0.0029 U
Xylene (total)	252	257	580	2500	0.0013 U	0.00082 U	0.0016 U	0.00085 U	0.0012 U	0.0011 U	0.0012 U	0.00075 U	0.001 U	0.001 U	0.00095 U	0.0011 U	0.0012 U	0.0012 U	0.00084 U	0.0012 U	0.00082 U	0.0016 U	0.0019 U	0.0014 U

TABLE 5.15-1
AOC 15 - COOLING TOWER AREAS: SOIL ANALYTICAL RESULTS COMPARED TO RESIDENTIAL AND NON-RESIDENTIAL SOIL CRITERIA
VERMONT YANKEE
VERNON, VERMONT

Location Name / Sample Name / Sample Date / Lab Sample ID / Sample Depth (bgs)	VT ANR 2019 Proposed Residential Soil	VT ANR 2019 Proposed Non-Residential Soil	USEPA RSL Residential Soil HI = 1.0 May 2019	USEPA RSL Industrial Soil HI = 1.0 May 2019	DP1501 DP150101 04/26/2019 JC87123-1 0 - 1 (ft)	DP1501 DP150125 04/26/2019 JC87123-2 25 - 26.5 (ft)	DP1502 DP150201 04/26/2019 JC87123-3 0 - 1 (ft)	DP1502 DP150226 04/26/2019 JC87123-4 26 - 27 (ft)	DP1503 DP150301 04/25/2019 JC87123-5 0 - 1 (ft)	DP1503 DP150310 04/25/2019 JC87123-6 10 - 11.5 (ft)	DP1504 DP150401 04/25/2019 JC87123-7 0 - 1 (ft)	DP1504 DP150415 04/25/2019 JC87123-8 15 - 16 (ft)	DP1505 DP150501 04/25/2019 JC87123-9 0 - 1 (ft)	DP1505 DP150514 04/25/2019 JC87123-10 14 - 15 (ft)	DP1506 DP150601 04/26/2019 JC87123-11 0 - 1 (ft)	DP1506 DP150623 04/26/2019 JC87123-13 23 - 24 (ft)	DP1507 DP150701 04/26/2019 JC87123-14 0 - 1 (ft)	DP1507 DP150701 DUP 04/26/2019 JC87123-18 0 - 1 (ft)	DP1507 DP150728 04/26/2019 JC87123-15 28 - 29 (ft)	DP1508 DP150801 04/26/2019 JC87123-16 0 - 1 (ft)	DP1508 DP150826 04/26/2019 JC87123-17 26 - 27 (ft)	SP1501 SP150100 05/17/2019 JC88412-10 0 - 0.5 (ft)	SP1501 SP150100DUP 05/17/2019 JC88412-11 0 - 0.5 (ft)	SP1502 SP150200 05/17/2019 JC88412-12 0 - 0.5 (ft)
Semi-Volatile Organic Compounds (mg/kg)																								
1,2,4-Trichlorobenzene	NA	NA	24	110	-	-	-	-	-	-	-	-	-	-	-	-	0.086 U	0.085 U	0.069 U	0.082 U	0.069 U	0.075 U	0.073 U	0.073 U
1,2-Dichlorobenzene	NA	NA	1800	9300	-	-	-	-	-	-	-	-	-	-	-	-	0.086 U	0.085 U	0.069 U	0.082 U	0.069 U	0.075 U	0.073 U	0.073 U
1,2-Diphenylhydrazine	NA	NA	0.68	2.9	-	-	-	-	-	-	-	-	-	-	-	-	0.086 U	0.085 U	0.069 U	0.082 U	0.069 U	0.075 U	0.073 U	0.073 U
1,3-Dichlorobenzene	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	0.086 U	0.085 U	0.069 U	0.082 U	0.069 U	0.075 U	0.073 U	0.073 U
1,4-Dichlorobenzene	NA	NA	2.6	11	-	-	-	-	-	-	-	-	-	-	-	-	0.086 U	0.085 U	0.069 U	0.082 U	0.069 U	0.075 U	0.073 U	0.073 U
1-Methylnaphthalene	NA	NA	18	73	-	-	-	-	-	-	-	-	-	-	-	-	0.043 U	0.043 U	0.035 U	0.041 U	0.035 U	0.038 U	0.037 U	0.037 UJ
2,2'-oxybis(1-Chloropropane)	2804	36274	3100	47000	-	-	-	-	-	-	-	-	-	-	-	-	0.086 U	0.085 U	0.069 U	0.082 U	0.069 U	0.075 U	0.073 U	0.073 U
2,4,5-Trichlorophenol	NA	NA	6300	82000	-	-	-	-	-	-	-	-	-	-	-	-	0.22 U	0.21 U	0.17 U	0.21 U	0.17 U	0.19 U	0.18 U	0.18 U
2,4,6-Trichlorophenol	NA	NA	49	210	-	-	-	-	-	-	-	-	-	-	-	-	0.22 U	0.21 U	0.17 U	0.21 U	0.17 U	0.19 U	0.18 U	0.18 U
2,4-Dichlorophenol	NA	NA	190	2500	-	-	-	-	-	-	-	-	-	-	-	-	0.22 U	0.21 U	0.17 U	0.21 U	0.17 U	0.19 U	0.18 U	0.18 U
2,4-Dimethylphenol	NA	NA	1300	16000	-	-	-	-	-	-	-	-	-	-	-	-	0.22 U	0.21 U	0.17 U	0.21 U	0.17 U	0.19 U	0.18 U	0.18 U
2,4-Dinitrophenol	NA	NA	130	1600	-	-	-	-	-	-	-	-	-	-	-	-	0.22 U	0.21 U	0.17 U	0.21 U	0.17 U	0.19 U	0.18 U	0.18 U
2,4-Dinitrotoluene	NA	NA	1.7	7.4	-	-	-	-	-	-	-	-	-	-	-	-	0.043 U	0.043 U	0.035 U	0.041 U	0.035 U	0.038 U	0.037 U	0.037 UJ
2,6-Dinitrotoluene	NA	NA	0.36	1.5	-	-	-	-	-	-	-	-	-	-	-	-	0.043 U	0.043 U	0.035 U	0.041 U	0.035 U	0.038 U	0.037 U	0.037 UJ
2-Chloronaphthalene	NA	NA	4800	60000	-	-	-	-	-	-	-	-	-	-	-	-	0.086 U	0.085 U	0.069 U	0.082 U	0.069 U	0.075 U	0.073 U	0.073 UJ
2-Chlorophenol	NA	NA	390	5800	-	-	-	-	-	-	-	-	-	-	-	-	0.086 U	0.085 U	0.069 U	0.082 U	0.069 U	0.075 U	0.073 U	0.073 U
2-Methylnaphthalene	NA	NA	240	3000	-	-	-	-	-	-	-	-	-	-	-	-	0.043 U	0.043 U	0.035 U	0.041 U	0.035 U	0.038 U	0.037 U	0.037 UJ
2-Methylphenol (o-Cresol)	NA	NA	3200	41000	-	-	-	-	-	-	-	-	-	-	-	-	0.086 U	0.085 U	0.069 U	0.082 U	0.069 U	0.075 U	0.073 U	0.073 U
2-Nitroaniline	NA	NA	630	8000	-	-	-	-	-	-	-	-	-	-	-	-	0.22 U	0.21 U	0.17 U	0.21 U	0.17 U	0.19 U	0.18 U	0.18 UJ
2-Nitrophenol	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	0.22 U	0.21 U	0.17 U	0.21 U	0.17 U	0.19 U	0.18 U	0.18 U
3&4-Methylphenol	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	0.086 U	0.085 U	0.069 U	0.082 U	0.069 U	0.075 U	0.073 U	0.073 U
3,3'-Dichlorobenzidine	NA	NA	1.2	5.1	-	-	-	-	-	-	-	-	-	-	-	-	0.086 U	0.085 U	0.069 U	0.082 U	0.069 U	0.075 UJ	0.073 U	0.073 UJ
3-Nitroaniline	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	0.22 U	0.21 U	0.17 U	0.21 U	0.17 U	0.19 U	0.18 U	0.18 UJ
4,6-Dinitro-2-methylphenol	NA	NA	5.1	66	-	-	-	-	-	-	-	-	-	-	-	-	0.22 U	0.21 U	0.17 U	0.21 U	0.17 U	0.19 U	0.18 U	0.18 U
4-Bromophenyl phenyl ether	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	0.086 U	0.085 U	0.069 U	0.082 U	0.069 U	0.075 U	0.073 U	0.073 UJ
4-Chloro-3-methylphenol	NA	NA	6300	82000	-	-	-	-	-	-	-	-	-	-	-	-	0.22 U	0.21 U	0.17 U	0.21 U	0.17 U	0.19 U	0.18 U	0.18 U
4-Chloroaniline	NA	NA	2.7	11	-	-	-	-	-	-	-	-	-	-	-	-	0.22 U	0.21 U	0.17 U	0.21 U	0.17 U	0.19 U	0.18 U	0.18 U
4-Chlorophenyl phenyl ether	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	0.086 U	0.085 U	0.069 U	0.082 U	0.069 U	0.075 U	0.073 U	0.073 UJ
4-Nitroaniline	NA	NA	27	110	-	-	-	-	-	-	-	-	-	-	-	-	0.22 U	0.21 U	0.17 U	0.21 U	0.17 U	0.19 U	0.18 U	0.18 UJ
4-Nitrophenol	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	0.43 U	0.43 U	0.35 U	0.41 U	0.35 U	0.38 U	0.37 U	0.37 U
Acenaphthene	NA	NA	3600	45000	0.039 U	0.034 U	0.035 U	0.035 U	0.036 U	0.037 U	0.036 U	0.036 U	0.035 U	0.034 U	0.036 U	0.032 U	0.043 U	0.043 U	0.035 U	0.041 U	0.035 U	0.038 U	0.037 U	0.037 UJ
Acenaphthylene	NA	NA	NA	NA	0.039 U	0.034 U	0.035 U	0.035 U	0.036 U	0.037 U	0.036 U	0.036 U	0.035 U	0.034 U	0.036 U	0.032 U	0.043 U	0.043 U	0.035 U	0.041 U	0.035 U	0.038 U	0.037 U	0.037 UJ
Aniline	NA	NA	95	400	-	-	-	-	-	-	-	-	-	-	-	-	0.086 U	0.0327 J	0.069 U	0.082 U	0.069 U	0.075 U	0.073 U	0.073 U
Anthracene	NA	NA	18000	230000	0.039 U	0.034 U	0.035 U	0.035 U	0.036 U	0.037 U	0.036 U	0.036 U	0.035 U	0.034 U	0.036 U	0.032 U	0.043 U	0.043 U	0.035 U	0.041 U	0.035 U	0.038 U	0.037 U	0.037 UJ
Benzidine	NA	NA	0.00053	0.01	-	-	-	-	-	-	-	-	-	-	-	-	***0.43 U***	***0.43 U***	***0.35 U***	***0.41 U***	***0.35 U***	***0.38 UJ***	***0.37 U***	***0.37 UJ***
Benzo(a)anthracene	NA	NA	1.1	21	0.039 U	0.034 U	0.035 U	0.035 U	0.036 U	0.037 U	0.036 U	0.036 U	0.035 U	0.034 U	0.0162 J	0.032 U	0.043 U	0.043 U	0.035 U	0.0354 J	0.035 U	0.038 U	0.037 U	0.0115 J-
Benzo(a)pyrene	0.07	1.54	0.11	2.1	0.039 U	0.034 U	0.035 U	0.035 U	0.036 U	0.037 U	0.036 U	0.036 U	0.035 U	0.034 U	0.036 U	0.032 U	0.043 U	0.043 U	0.035 U	0.0317 J	0.035 U	0.038 U	0.037 U	0.037 UJ
Benzo(b)fluoranthene	NA	NA	1.1	21	0.039 U	0.034 U	0.035 U	0.035 U	0.036 U	0.037 U	0.036 U	0.036 U	0.035 U	0.034 U	0.036 U	0.032 U	0.043 U	0.043 U	0.035 U	0.0388 J	0.035 U	0.038 U	0.037 U	0.037 UJ
Benzo(g,h,i)perylene	NA	NA	NA	NA	0.039 U	0.034 U	0.035 U	0.035 U	0.036 U	0.037 U	0.036 U	0.036 U	0.035 U	0.034 U	0.036 U	0.032 U	0.043 U	0.043 U	0.035 U	0.0253 J	0.035 U	0.038 U	0.037 U	0.037 UJ
Benzo(k)fluoranthene	NA	NA	11	210	0.039 U	0.034 U	0.035 U	0.035 U	0.036 U	0.037 U	0.036 U	0.036 U	0.035 U	0.034 U	0.036 U	0.032 U	0.043 U	0.043 U	0.035 U	0.041 U	0.035 U	0.038 U	0.037 U	0.037 UJ
Benzoic acid	NA	NA	250000	3.30E+06	-	-	-	-	-	-	-	-	-	-	-	-	0.86 U	0.85 U	0.69 U	0.82 U	0.69 U	0.75 U	0.73 U	0.73 U
Benzyl Alcohol	NA	NA	6300	82000	-	-	-	-	-	-	-	-	-	-	-	-	0.086 U	0.085 U	0.069 U	0.082 U	0.069 U	0.075 U	0.073 U	0.073 U
bis(2-Chloroethoxy)methane	NA	NA	190	2500	-	-	-	-	-	-	-	-	-	-	-	-	0.086 U	0.085 U	0.069 U	0.082 U	0.069 U	0.075 U	0.073 U	0.073 U
bis(2-Chloroethyl)ether	NA	NA	0.23	1	-	-	-	-	-	-	-	-	-	-	-	-	0.086 U	0.085 U	0.069 U	0.082 U	0.069 U	0.075 U	0.073 U	0.073 U
bis(2-Ethylhexyl)phthalate	20	120	39	160	-	-	-	-	-	-	-	-	-	-	-	-	0.086 U	0.085 U	0.069 U	0.082 U	0.069 U	0.075 U	0.073 U	0.073 UJ
Butyl benzylphthalate	NA	NA	290	1200	-	-	-	-	-	-	-	-	-	-	-	-	0.086 U	0.085 U	0.069 U	0.082 U	0.069 U	0.075 U	0.073 U	0.073 UJ
Carbazole	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	0.086 U	0.085 U	0.069 U	0.082 U	0.069 U	0.075 U	0.073 U	0.073 UJ
Chrysene	NA	NA	110	2100	0.039 U	0.034 U	0.035 U	0.035 U	0.036 U	0.037 U	0.036 U	0.036 U	0.035 U	0.034 U	0.0185 J	0.032 U	0.043 U	0.043 U	0.035 U	0.0346 J	0.035 U	0.038 U	0.037 U	0.037 UJ
Dibenz(a,h)anthracene	NA	NA	0.11	2.1	0.039 U	0.034 U	0.035 U	0.035 U	0.036 U	0.037 U	0.036 U	0.036 U	0.035 U	0.034 U	0.036 U	0.032 U	0.043 U	0.043 U	0.035 U	0.041 U	0.035 U	0.038 U	0.037 U	0.037 UJ
Dibenzofuran	NA	NA	73	1000	-	-	-	-	-	-	-	-	-	-	-	-	0.086 U	0.085 U	0.069 U	0.082 U	0.069 U	0.075 U	0.073 U	0.073 UJ
Diethyl phthalate	NA	NA	51000	660000	-	-	-	-	-	-	-	-	-	-	-	-	0.086 U	0.085 U	0.069 U	0.082 U	0.069 U	0.075 U	0.073 U	0.073 UJ
Dimethyl phthalate	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	0.086 U	0.085 U	0.069 U	0.082 U	0.069 U	0.075 U	0.073 U	0.073 UJ
Di-n-butylphthalate	NA	NA	6300	82000	-	-	-	-	-	-	-	-	-	-	-	-	0.086 U	0.085 U	0.069 U	0.082 U	0.069 U	0.075 U	0.073 U	0.073 UJ
Di-n-octyl phthalate	NA	NA	630	8200	-	-	-	-	-	-	-	-	-	-	-	-	0.086 U	0.085 U	0.069 U	0.082 U	0.069 U	0.075 U	0.073 U	0.073 UJ
Fluoranthene	2301	26371	2400	30000	0.039 U	0.034 U	0.035 U	0.035 U	0.036 U	0.037 U	0.036 U	0.036 U	0.035 U	0.034 U	0.0551	0.032 U	0.043 U	0.043 U	0.035 U	0.0713	0.035 U	0.038 U	0.037 U	0.037 UJ
Fluorene	2301	26371	2400	30000	0.039 U	0.034 U	0.035 U	0.035 U	0.036 U	0.037 U	0.036 U	0.036 U	0.035 U	0.034 U	0.036 U	0.032 U	0.043 U	0.043 U	0.035 U	0.041 U	0.035 U	0.038 U	0.037 U	0.037 UJ
Hexachlorobenzene	0.13	0.69	0.21	0.96	-	-	-	-	-	-	-	-	-	-	-	-	0.086 U	0.085 U	0.069 U	0.082 U	0.069 U	0.075 U	0.073 U	0.073 UJ
Hexachlorobutadiene	NA	NA	1.2	5.3	-	-	-	-	-	-	-	-	-	-	-	-	0.043 U	0.043 U	0.035 U	0.041 U	0.035 U	0.038 U	0.037 U	0.037 U
Hexachlorocyclopentadiene	NA	NA	1.8	7.5	-	-	-	-	-	-	-	-	-	-	-	-	0.43 U	0.43 U	0.35 U	0.41 U	0.35 U	0.38 U	0.37 U	0.37 UJ
Hexachloroethane	NA	NA	1.8	8	-	-	-	-	-	-	-	-	-	-	-	-	0.22 U	0.21 U	0.17 U	0.21 U	0.17 U	0.19 U	0.18 U	0.18 U
Indeno(1,2,3-cd)pyrene	NA	NA	1.1	21	0.039 U	0.034 U	0.035 U	0.035 U	0.036 U	0.037 U	0.036 U	0.036 U	0.035 U	0.034 U	0.036 U	0.032 U	0.043 U	0.043 U	0.035 U	0.0426	0.035 U	0.038 U	0.037 U	0.037 UJ
Isophorone	NA	NA	570	2400	-	-	-	-	-	-	-	-	-	-	-	-	0.086 U	0.085 U	0.069 U	0.082 U	0.069 U	0.075 U	0.073 U	0.073 U
Naphthalene	2.7	16	3.8	17	0.039 U	0.034 U	0.035 U	0.035 U	0.036 U	0.037 U	0.036 U	0.036 U	0.035 U	0.034 U	0.036 U	0.032 U	0.043 U	0.043 U	0.035 U	0.041 U	0.035 U	0.038 U	0.037 U	0.037 U
Nitrobenzene	NA	NA	5.1	22	-	-	-	-	-	-	-	-	-	-	-	-	0.086 U	0.085 U	0.069 U	0.082 U	0.069 U	0.075 U	0.073 U	0.073 U
N-Nitrosodimethylamine	NA	NA	0.002	0.034	-	-	-	-	-	-	-	-	-	-	-	-	***0.086 U***	***0.085 U***	***0.069 U***	***0.082 U***	***0.069 U***	***0.075 U***	***0.073 U***	***0.073 U***
N-Nitrosodi-n-propylamine	NA	NA	0.078	0.33	-	-	-	-	-	-	-	-	-	-	-	-	**0.086 U**	**0.085 U**	0.069 U	**0.082 U**	0.069 U	0.075 U	0.073 U	0.073 U
N-Nitrosodiphenylamine	NA	NA	110	470	-	-	-	-	-	-	-	-	-	-	-	-	0.22 U	0.21 U	0.17 U	0.21 U	0.17 U	0.19 U	0.18 U	0.18 UJ
Pentachlorophenol	0.48	2.9	1	4	-	-	-	-	-	-	-	-	-	-	-	-	0.17 U	0.17 U	0.14 U	0.16 U	0.14 U	0.15 U	0.15 U	0.15 U
Phenanthrene	NA	NA	NA	NA	0.039 U	0.034 U	0.035 U	0.035 U	0.036 U	0.037 U	0.036 U	0.036 U	0.035 U	0.034 U	0.0748	0.032 U	0.043 U	0.043 U	0.035 U	0.0307 J	0.035 U	0.038 UJ	0.037 U	0.037 UJ
Phenol	NA	NA	19000	250000	-	-	-	-	-	-	-	-	-	-	-	-	0.086 U	0.085 U	0.069 U	0.082 U	0.069 U	0.075 U	0.073 U	0.073 U
Pyrene	NA	NA	1800	23000	0.039 U	0.034 U	0.035 U	0.035 U	0.036 U	0.037 U	0.036 U	0.036 U	0.035 U	0.034 U	0.0409	0.032 U	0.043 U	0.043 U	0.035 U	0.0544	0.035 U	0.038 U	0.037 U	0.0144 J-
Pyridine	NA	NA	78	1200	-	-	-	-	-	-	-	-	-	-	-	-	0.086 U	0.085 U	0.069 U	0.082 U	0.069 U	0.075 U	0.073 U	0.073 U
Benzo(a)Pyrene Equivalent (ND = 0 RL)	0.07	1.54	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.0016	ND	ND	ND	ND	0.043	ND	ND	ND	0.012
Benzo(a)Pyrene Equivalent (ND = 1/2 RL)	0.07	1.54	NA	NA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.041	ND	ND	ND	ND	0.064	ND	ND	ND	0.036

TABLE 5.15-1
AOC 15 - COOLING TOWER AREAS: SOIL ANALYTICAL RESULTS COMPARED TO RESIDENTIAL AND NON-RESIDENTIAL SOIL CRITERIA
VERMONT YANKEE
VERNON, VERMONT

Location Name / Sample Name / Sample Date / Lab Sample ID / Sample Depth (bgs)	VT ANR 2019 Proposed Residential Soil	VT ANR 2019 Proposed Non-Residential Soil	USEPA RSL Residential Soil HI = 1.0 May 2019	USEPA RSL Industrial Soil HI = 1.0 May 2019	DP1501 DP150101 04/26/2019 JC87123-1 0 - 1 (ft)	DP1501 DP150125 04/26/2019 JC87123-2 25 - 26.5 (ft)	DP1502 DP150201 04/26/2019 JC87123-3 0 - 1 (ft)	DP1502 DP150226 04/26/2019 JC87123-4 26 - 27 (ft)	DP1503 DP150301 04/25/2019 JC87123-5 0 - 1 (ft)	DP1503 DP150310 04/25/2019 JC87123-6 10 - 11.5 (ft)	DP1504 DP150401 04/25/2019 JC87123-7 0 - 1 (ft)	DP1504 DP150415 04/25/2019 JC87123-8 15 - 16 (ft)	DP1505 DP150501 04/25/2019 JC87123-9 0 - 1 (ft)	DP1505 DP150514 04/25/2019 JC87123-10 14 - 15 (ft)	DP1506 DP150601 04/26/2019 JC87123-11 0 - 1 (ft)	DP1506 DP150623 04/26/2019 JC87123-13 23 - 24 (ft)	DP1507 DP150701 04/26/2019 JC87123-14 0 - 1 (ft)	DP1507 DP150701 DUP 04/26/2019 JC87123-18 0 - 1 (ft)	DP1507 DP150728 04/26/2019 JC87123-15 28 - 29 (ft)	DP1508 DP150801 04/26/2019 JC87123-16 0 - 1 (ft)	DP1508 DP150826 04/26/2019 JC87123-17 26 - 27 (ft)	SP1501 SP150100 05/17/2019 JC88412-10 0 - 0.5 (ft)	SP1501 SP150100DUP 05/17/2019 JC88412-11 0 - 0.5 (ft)	SP1502 SP150200 05/17/2019 JC88412-12 0 - 0.5 (ft)
Total Petroleum Hydrocarbons (mg/kg)																								
Total Petroleum Hydrocarbons (C10-C28) DRO	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	13 U	11 U	10 U	12 U	9.9 U	11 U	10 U	26.9
Total Petroleum Hydrocarbons (C6-C10) GRO	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	26 U	30 U	19 U	30 U	19 U	35 U	34 U	80 U
Inorganic Compounds (mg/kg)																								
Aluminum	72507	941748	77000	1.10E+06	8800	6650	5890	6800	8310	7070	8050	6180	7110	4450	8640	6800	13700	12000	7010	9390	5970	9960 J+	9940 J+	9500 J+
Antimony	26	319	31	470	2.4 UJ	2.3 UJ	2.2 UJ	2.1 UJ	2.3 UJ	2.3 UJ	2.3 UJ	2.2 UJ	2.3 UJ	2.2 UJ	2.2 UJ	2.1 UJ	2.7 UJ	2.7 UJ	2.1 UJ	2.5 UJ	2.1 UJ	2.3 UJ	2.2 UJ	2.3 UJ
Arsenic	16	16	0.68	3	3.5	2.9	2.9	2.8	3.9	3.9	4.1	3.4	3.6	2.5	4.2	3.9	5.5	5.8	9.1	4.4	3.4	3.8	3.8	6.1
Barium	11247	127382	15000	220000	26.5	23 U	22 U	21 U	27.7	25.9	30.3	22 U	23 U	22 U	26.1	21 U	49.8	41.9	26.1	29.9	21 U	32	30.5	25
Beryllium	35	289	160	2300	0.31	0.23 U	0.22	0.21	0.32	0.23 U	0.3	0.24	0.27	0.22 U	0.31	0.22	0.44	0.41	0.22	0.34	0.21	0.24	0.25	0.23 U
Cadmium	6.9	87	71	980	0.6 U	0.56 U	0.54 U	0.53 U	0.57 U	0.57 U	0.57 U	0.55 U	0.56 U	0.54 U	0.56 U	0.53 U	0.67 U	0.66 U	0.53 U	0.62 U	0.53 U	0.58 U	0.55 U	0.57 U
Calcium	NA	NA	NA	NA	1560	1290	1120	879	1680	1750	1690	1310	1210	793	2780	1570	1060	991	1070	1460	1090	1740	1720	1440
Chromium	NA	NA	NA	NA	16.6	16.5	11.6	16.4	16.6	14.4	15.5	13.9	12.8	9.8	27	40.9	20.9	18	14.2	17.5	17.9	14.2	13.9	18.1
Cobalt	22	291	23	350	7.3	5.6 U	5.9	6.1	6.9	5.7 U	7.2	5.6	6.1	5.4 U	7.2	7.6	8.9	7.6	6.1	7.4	5.3	5.8 U	5.5 U	6.8
Copper	10407	139231	3100	47000	14.4	9.7	8	8	12.7	8.7	12.7	7.1	10.9	3.7	13	8.5	13.5	14.3	7.5	13.7	7.3	11.5	11	18.2
Iron	51302	686351	55000	820000	15700	13400	11900	14000	15200	12100	14800	12300	13300	8830	16000	14600	19600	18200	18400	16300	13500	12800	12500	17600
Lead	400	800	400	800	4.1	3.4	3.2	3.8	4.5	3.4	4.3	3.1	3.8	2.4	4.6	3.8	11.7	10.5	3.2	6.5	3.1	10.4	10.2	12.1
Magnesium	NA	NA	NA	NA	4140	3420	2980	3830	3970	3600	3810	3070	3330	2380	4550	4990	4310	3940	3870	4090	2960	2970	2910	4230
Manganese	1118	11350	1800	26000	332	237	235	203	302	132	363	284	249	158	303	242	517	407	176	350	246	339	349	281
Mercury	3.1	3.1	11	46	0.036 U	0.035 U	0.034 U	0.035 U	0.034 U	0.037 U	0.035 U	0.032 U	0.035 U	0.032 U	0.034 U	0.034 U	0.054	0.044	0.032 U	0.033 U	0.033 U	0.035 U	0.036 U	0.034 U
Nickel	940	9707	1500	22000	19.1	13.8	13	19.6	17.4	12.5	17.9	14.3	15.2	9.8	17.1	31.9	20.8	18.7	16.9	19	13.5	13.8	13.8	17.4
Potassium	NA	NA	NA	NA	1200 U	1100 U	1100 U	1100 U	1100 U	1100 U	1100 U	1100 U	1100 U	1100 U	1100 U	1100 U	1300 U	1300 U	1100 U	1200 U	1100 U	1200 U	1100 U	1100 U
Selenium	366	4900	390	5800	2.4 U	2.3 U	2.2 U	2.1 U	2.3 U	2.3 U	2.3 U	2.2 U	2.3 U	2.2 U	2.2 U	2.1 U	2.7 U	2.7 U	2.1 U	2.5 U	2.1 U	2.3 U	2.2 U	2.3 U
Silver	237	2483	390	5800	0.6 U	0.56 U	0.54 U	0.53 U	0.57 U	0.57 U	0.57 U	0.55 U	0.56 U	0.54 U	0.56 U	0.53 U	0.67 U	0.66 U	0.53 U	0.62 U	0.53 U	0.58 U	0.55 U	0.57 U
Sodium	NA	NA	NA	NA	1200 U	1100 U	1100 U	1100 U	1100 U	1100 U	1100 U	1100 U	1100 U	1100 U	1100 U	1100 U	1300 U	1300 U	1100 U	1200 U	1100 U	1200 U	1100 U	1100 U
Thallium	0.73	196100	0.78	12	**1.2 U**	**1.1 U**	**1.1 U**	**1.1 U**	**1.1 U**	**1.1 U**	**1.1 U**	**1.1 U**	**1.1 U**	**1.1 U**	**1.1 U**	**1.1 U**	**1.3 U**	**1.3 U**	**1.1 U**	**1.2 U**	**1.1 U**	**1.2 U**	**1.1 U**	**1.1 U**
Vanadium	2.8	27	390	5800	**19.2**	**14.8**	**14.1**	**15**	**18.8**	**16.8**	**18.1**	**14.6**	**15.7**	**9.8**	**22.7**	**15.3**	**24.4**	**21.6**	**15.1**	**20.1**	**13.9**	**17.5**	**17.5**	**26.4**
Zinc	21986	294150	23000	350000	35.6	29.4	69	29.1	34.7	26.5	34.9	25	30.1	19.6	38.2	27.9	50.6	48.6	27.4	60	27.8	39.7	38.4	72.8
PCBs (mg/kg)																								
Aroclor-1016 (PCB-1016)	NA	NA	4.1	27	-	-	-	-	-	-	-	-	-	-	-	-	0.041 U	0.04 U	0.035 U	0.04 U	0.034 U	0.035 U	0.034 U	0.035 U
Aroclor-1221 (PCB-1221)	NA	NA	0.2	0.83	-	-	-	-	-	-	-	-	-	-	-	-	0.041 U	0.04 U	0.035 U	0.04 U	0.034 U	0.035 U	0.034 U	0.035 U
Aroclor-1232 (PCB-1232)	NA	NA	0.17	0.72	-	-	-	-	-	-	-	-	-	-	-	-	0.041 U	0.04 U	0.035 U	0.04 U	0.034 U	0.035 U	0.034 U	0.035 U
Aroclor-1242 (PCB-1242)	NA	NA	0.23	0.95	-	-	-	-	-	-	-	-	-	-	-	-	0.041 U	0.04 U	0.035 U	0.04 U	0.034 U	0.035 U	0.034 U	0.035 U
Aroclor-1248 (PCB-1248)	NA	NA	0.23	0.95	-	-	-	-	-	-	-	-	-	-	-	-	0.041 U	0.04 U	0.035 U	0.04 U	0.034 U	0.035 U	0.034 U	0.035 U
Aroclor-1254 (PCB-1254)	NA	NA	0.24	0.97	-	-	-	-	-	-	-	-	-	-	-	-	0.041 U	0.04 U	0.035 U	0.04 U	0.034 U	0.035 U	0.034 U	0.035 U
Aroclor-1260 (PCB-1260)	NA	NA	0.24	0.99	-	-	-	-	-	-	-	-	-	-	-	-	0.041 U	0.04 U	0.035 U	0.04 U	0.034 U	0.035 U	0.034 U	0.035 U
Aroclor-1262 (PCB-1262)	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	0.041 U	0.04 U	0.035 U	0.04 U	0.034 U	0.035 U	0.034 U	0.035 U
Aroclor-1268 (PCB-1268)	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	0.041 U	0.04 U	0.035 U	0.04 U	0.034 U	0.035 U	0.034 U	0.035 U
SUM of PCBs	NA	NA	0.23	0.94	-	-	-	-	-	-	-	-	-	-	-	-	ND	ND	ND	ND	ND	ND	ND	ND
Other																								
Total Solids (%)	NA	NA	NA	NA	81.9	92.3	93.8	92.3	90.9	88	90.2	90.1	90.5	96.1	90.8	96.8	76.6	77.7	94	80.3	92	87	90.8	90.8
Herbicides (mg/kg)																								
2,4,5-T	NA	NA	630	8200	-	-	-	-	-	-	-	-	-	-	-	-	0.0042 U	0.0039 U	0.0032 U	0.0038 U	0.0034 U	0.0037 U	0.0033 U	0.0034 U
2,4,5-TP (Silvex)	NA	NA	510	6600	-	-	-	-	-	-	-	-	-	-	-	-	0.0042 U	0.0039 U	0.0032 U	0.0038 U	0.0034 U	0.0037 U	0.0033 U	0.0034 U
2,4-Dichlorophenoxyacetic acid (2,4-D)	NA	NA	700	9600	-	-	-	-	-	-	-	-	-	-	-	-	0.021 U	0.02 U	0.016 U	0.019 U	0.017 U	0.018 U	0.016 U	0.017 U
Dalapon	NA	NA	1900	25000	-	-	-	-	-	-	-	-	-	-	-	-	0.0042 U	0.0039 U	0.0032 U	0.0038 U	0.0034 U	0.0037 U	0.0033 U	0.0034 U
Dichloroprop	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	0.021 U	0.02 U	0.016 U	0.019 U	0.017 U	0.018 UJ	0.016 U	0.017 U
Dinoseb	NA	NA	63	820	-	-	-	-	-	-	-	-	-	-	-	-	0.021 U	0.02 U	0.016 U	0.019 U	0.017 U	0.018 U	0.016 U	0.017 U

TABLE 5.15-1
AOC 15 - COOLING TOWER AREAS: SOIL ANALYTICAL RESULTS COMPARED TO RESIDENTIAL AND NON-RESIDENTIAL SOIL CRITERIA
VERMONT YANKEE
VERNON, VERMONT

Location Name Sample Name Sample Date Lab Sample ID Sample Depth (bgs)	VT ANR 2019 Proposed Residential Soil	VT ANR 2019 Proposed Non-Residential Soil	USEPA RSL Residential Soil HI = 1.0 May 2019	USEPA RSL Industrial Soil HI = 1.0 May 2019	DP1501 DP150101 04/26/2019 JC87123-1 0 - 1 (ft)	DP1501 DP150125 04/26/2019 JC87123-2 25 - 26.5 (ft)	DP1502 DP150201 04/26/2019 JC87123-3 0 - 1 (ft)	DP1502 DP150226 04/26/2019 JC87123-4 26 - 27 (ft)	DP1503 DP150301 04/25/2019 JC87123-5 0 - 1 (ft)	DP1503 DP150310 04/25/2019 JC87123-6 10 - 11.5 (ft)	DP1504 DP150401 04/25/2019 JC87123-7 0 - 1 (ft)	DP1504 DP150415 04/25/2019 JC87123-8 15 - 16 (ft)	DP1505 DP150501 04/25/2019 JC87123-9 0 - 1 (ft)	DP1505 DP150514 04/25/2019 JC87123-10 14 - 15 (ft)	DP1506 DP150601 04/26/2019 JC87123-11 0 - 1 (ft)	DP1506 DP150623 04/26/2019 JC87123-13 23 - 24 (ft)	DP1507 DP150701 04/26/2019 JC87123-14 0 - 1 (ft)	DP1507 DP150701 DUP 04/26/2019 JC87123-18 0 - 1 (ft)	DP1507 DP150728 04/26/2019 JC87123-15 28 - 29 (ft)	DP1508 DP150801 04/26/2019 JC87123-16 0 - 1 (ft)	DP1508 DP150826 04/26/2019 JC87123-17 26 - 27 (ft)	SP1501 SP150100 05/17/2019 JC88412-10 0 - 0.5 (ft)	SP1501 SP150100DUP 05/17/2019 JC88412-11 0 - 0.5 (ft)	SP1502 SP150200 05/17/2019 JC88412-12 0 - 0.5 (ft)
Pesticides (mg/kg)																								
4,4'-DDD	NA	NA	1.9	9.6	-	-	-	-	-	-	-	-	-	-	-	-	0.00083 U	0.0008 U	0.0007 U	0.0008 U	0.00068 U	0.00069 U	0.00068 U	0.00073 U
4,4'-DDE	NA	NA	2	9.3	-	-	-	-	-	-	-	-	-	-	-	-	0.00083 U	0.0008 U	0.0007 U	0.0008 U	0.00068 U	0.00069 U	0.00068 U	0.00073 U
4,4'-DDT	NA	NA	1.9	8.5	-	-	-	-	-	-	-	-	-	-	-	-	0.00083 U	0.0008 U	0.0007 U	0.0008 U	0.00068 U	0.002	0.00068 U	0.00073 U
Aldrin	0.02	0.1	0.039	0.18	-	-	-	-	-	-	-	-	-	-	-	-	0.00083 U	0.0008 U	0.0007 U	0.0008 U	0.00068 U	0.00069 U	0.00068 U	0.00073 U
alpha-BHC	NA	NA	0.086	0.36	-	-	-	-	-	-	-	-	-	-	-	-	0.00083 U	0.0008 U	0.0007 U	0.0008 U	0.00068 U	0.00069 U	0.00068 U	0.00073 U
alpha-Chlordane	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	0.00083 U	0.0008 U	0.0007 U	0.0008 U	0.00068 U	0.00069 U	0.00068 U	0.00073 U
beta-BHC	NA	NA	0.3	1.3	-	-	-	-	-	-	-	-	-	-	-	-	0.00083 U	0.0008 U	0.0007 U	0.0008 U	0.00068 U	0.00069 U	0.00068 U	0.00073 U
delta-BHC	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	0.00083 U	0.0008 U	0.0007 U	0.0008 U	0.00068 U	0.00069 U	0.00068 U	0.00073 U
Dieldrin	NA	NA	0.034	0.14	-	-	-	-	-	-	-	-	-	-	-	-	0.00083 U	0.0008 U	0.0007 U	0.0008 U	0.00068 U	0.00069 U	0.00068 U	0.00073 U
Endosulfan I	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	0.00083 U	0.0008 U	0.0007 U	0.0008 U	0.00068 U	0.00069 U	0.00068 U	0.00073 U
Endosulfan II	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	0.00083 U	0.0008 U	0.0007 U	0.0008 U	0.00068 U	0.00069 U	0.00068 U	0.00073 U
Endosulfan sulfate	NA	NA	380	4900	-	-	-	-	-	-	-	-	-	-	-	-	0.00083 U	0.0008 U	0.0007 U	0.0008 U	0.00068 U	0.00069 U	0.00068 U	0.00073 U
Endrin	NA	NA	19	250	-	-	-	-	-	-	-	-	-	-	-	-	0.00083 U	0.0008 U	0.0007 U	0.0008 U	0.00068 U	0.00069 U	0.00068 U	0.00073 U
Endrin aldehyde	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	0.00083 U	0.0008 U	0.0007 U	0.0008 U	0.00068 U	0.00069 U	0.00068 U	0.00073 U
Endrin ketone	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	0.00083 U	0.0008 U	0.0007 U	0.0008 U	0.00068 U	0.00069 U	0.00068 U	0.00073 U
gamma-BHC (Lindane)	NA	NA	0.57	2.5	-	-	-	-	-	-	-	-	-	-	-	-	0.00083 U	0.0008 U	0.0007 U	0.0008 U	0.00068 U	0.00069 U	0.00068 U	0.00073 U
gamma-Chlordane	NA	NA	NA	NA	-	-	-	-	-	-	-	-	-	-	-	-	0.00083 U	0.0008 U	0.0007 U	0.0008 U	0.00068 U	0.00069 U	0.00068 U	0.00073 U
Heptachlor	NA	NA	0.13	0.63	-	-	-	-	-	-	-	-	-	-	-	-	0.00083 U	0.0008 U	0.0007 U	0.0008 U	0.00068 U	0.00069 U	0.00068 U	0.00073 U
Heptachlor epoxide	NA	NA	0.07	0.33	-	-	-	-	-	-	-	-	-	-	-	-	0.00083 U	0.0008 U	0.0007 U	0.0008 U	0.00068 U	0.00069 U	0.00068 U	0.00073 U
Methoxychlor	NA	NA	320	4100	-	-	-	-	-	-	-	-	-	-	-	-	0.0017 U	0.0016 U	0.0014 U	0.0016 U	0.0014 U	0.0014 U	0.0014 U	0.0015 U
Toxaphene	NA	NA	0.49	2.1	-	-	-	-	-	-	-	-	-	-	-	-	0.021 U	0.02 U	0.017 U	0.02 U	0.017 U	0.017 U	0.017 U	0.018 U

ABBREVIATIONS AND NOTES:
-: Not Analyzed
*: Outside of QC limits
J: value is estimated
mg/kg: milligram per kilogram
NA: Not Applicable
RSL: Risk-Based Screening Levels
U: Not detected, value is the laboratory reporting limit
VT ANR: Vermont Agency of Natural Resources
USEPA: United State Environmental Protection Agency

- Volatile and Semi-Volatile analytes detected in at least one sample are reported herein. For a complete list of analytes see the laboratory data sheets.
- Bold values indicate an exceedance of the Proposed 2019 VT ANR Residential Soil values and the USEPA May 2019 Residential Soil RSL where no VT ANR value is available.
- Italicized values indicate an exceedance of the Proposed 2019 VT ANR Non-Residential Soil values and the USEPA May 2019 Industrial Soil RSL where no VT ANR value is available.

TABLE 5.15-2
AOC 15 - COOLING TOWER AREA: GROUNDWATER ANALYTICAL RESULTS COMPARED TO GROUNDWATER ENFORCEMENT STANDARDS
VERMONT YANKEE
VERNON, VERMONT

Location Name Sample Name Sample Date Lab Sample ID	VT ANR Proposed 2019 Groundwater Enforcement	DP1501 GW1501-20190514 05/14/2019 JC88348-2	DP1501 GW1501-20190514 DUP 05/14/2019 JC88348-3	DP1502 GW1502-20190426 04/26/2019 JC87127-1	DP1503 GW1503-20190515 05/16/2019 JC88303-3	DP1504 GW1504-20190426 04/26/2019 JC87127-2	DP1505 GW1505-20190510 05/10/2019 JC87972-4	DP1506 GW1506-20190426 04/26/2019 JC87127-3	DP1507 GW1507-20190426 04/26/2019 JC87127-4	DP1508 GW1508-20190513 05/13/2019 JC88348-1
Volatile Organic Compounds (ug/L)										
1,1,1,2-Tetrachloroethane	70	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,1-Trichloroethane	200	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	70	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	7	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloropropene	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2,3-Trichlorobenzene	0.9	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**
1,2,3-Trichloropropane	0.02	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**
1,2,4-Trichlorobenzene	70	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2,4-Trimethylbenzene	23	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,2-Dibromo-3-chloropropane (DBCP)	0.2	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**
1,2-Dibromoethane (Ethylene Dibromide)	0.05	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**
1,2-Dichlorobenzene	600	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloropropane	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,3,5-Trimethylbenzene	23	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,3-Dichlorobenzene	600	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,3-Dichloropropane	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	75	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2,2-Dichloropropane	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2-Butanone (Methyl Ethyl Ketone)	511	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Chlorotoluene	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
2-Phenylbutane (sec-Butylbenzene)	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
4-Chlorotoluene	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	NA	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Acetone	950	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzene	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Bromobenzene	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromodichloromethane	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2.5
Bromoform	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromomethane (Methyl Bromide)	5	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Carbon tetrachloride	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	100	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobromomethane	8	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroethane	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroform (Trichloromethane)	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	8.6
Chloromethane (Methyl Chloride)	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
cis-1,2-Dichloroethene	70	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
cis-1,3-Dichloropropene	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Cymene (p-Isopropyltoluene)	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Dibromochloromethane	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.67 J
Dibromomethane	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Dichlorodifluoromethane (CFC-12)	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Ethylbenzene	700	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Hexachlorobutadiene	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Isopropylbenzene (Cumene)	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
m,p-Xylenes	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Methyl Tert Butyl Ether	11	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Methylene chloride	5	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Naphthalene	0.5	**5 U**	**5 U**	**5 U**	**5 U**	**5 U**	**5 U**	**5 U**	**5 U**	**5 U**
n-Butylbenzene	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
n-Propylbenzene	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
o-Xylene	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Styrene	100	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
tert-Butylbenzene	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Tetrachloroethene	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	1000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,2-Dichloroethene	100	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,3-Dichloropropene	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichlorofluoromethane (CFC-11)	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Vinyl chloride	2	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Xylene (total)	10000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U

TABLE 5.15-2
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VERMONT YANKEE
VERNON, VERMONT

Location Name Sample Name Sample Date Lab Sample ID	VT ANR Proposed 2019 Groundwater Enforcement	DP1501 GW1501-20190514 05/14/2019 JC88348-2	DP1501 GW1501-20190514 DUP 05/14/2019 JC88348-3	DP1502 GW1502-20190426 04/26/2019 JC87127-1	DP1503 GW1503-20190515 05/16/2019 JC88303-3	DP1504 GW1504-20190426 04/26/2019 JC87127-2	DP1505 GW1505-20190510 05/10/2019 JC87972-4	DP1506 GW1506-20190426 04/26/2019 JC87127-3	DP1507 GW1507-20190426 04/26/2019 JC87127-4	DP1508 GW1508-20190513 05/13/2019 JC88348-1
Semi-Volatile Organic Compounds (ug/L)										
1,2,4-Trichlorobenzene	70	-	-	-	-	-	-	-	0.99 U	0.98 U
1,2-Dichlorobenzene	600	-	-	-	-	-	-	-	0.99 U	0.98 U
1,2-Diphenylhydrazine	NA	-	-	-	-	-	-	-	0.99 U	0.98 U
1,3-Dichlorobenzene	600	-	-	-	-	-	-	-	0.99 U	0.98 U
1,4-Dichlorobenzene	75	-	-	-	-	-	-	-	0.99 U	0.98 U
1-Methylnaphthalene	NA	-	-	-	-	-	-	-	0.99 U	0.98 U
2,2'-oxybis(1-Chloropropane)	46	-	-	-	-	-	-	-	2 U	2 U
2,4,5-Trichlorophenol	NA	-	-	-	-	-	-	-	5 U	4.9 U
2,4,6-Trichlorophenol	NA	-	-	-	-	-	-	-	5 U	4.9 U
2,4-Dichlorophenol	NA	-	-	-	-	-	-	-	2 U	2 U
2,4-Dimethylphenol	NA	-	-	-	-	-	-	-	5 U	4.9 U
2,4-Dinitrophenol	NA	-	-	-	-	-	-	-	5 U	4.9 U
2,4-Dinitrotoluene	NA	-	-	-	-	-	-	-	0.99 U	0.98 U
2,6-Dinitrotoluene	NA	-	-	-	-	-	-	-	0.99 U	0.98 U
2-Chloronaphthalene	NA	-	-	-	-	-	-	-	2 U	2 UJ
2-Chlorophenol	NA	-	-	-	-	-	-	-	5 U	4.9 U
2-Methylnaphthalene	NA	-	-	-	-	-	-	-	0.99 U	0.98 U
2-Methylphenol (o-Cresol)	NA	-	-	-	-	-	-	-	2 U	2 U
2-Nitroaniline	NA	-	-	-	-	-	-	-	5 U	4.9 UJ
2-Nitrophenol	NA	-	-	-	-	-	-	-	5 U	4.9 U
3&4-Methylphenol	NA	-	-	-	-	-	-	-	2 U	2 U
3,3'-Dichlorobenzidine	NA	-	-	-	-	-	-	-	2 U	2 U
3-Nitroaniline	NA	-	-	-	-	-	-	-	5 U	4.9 U
4,6-Dinitro-2-methylphenol	NA	-	-	-	-	-	-	-	5 U	4.9 U
4-Bromophenyl phenyl ether	NA	-	-	-	-	-	-	-	2 U	2 U
4-Chloro-3-methylphenol	NA	-	-	-	-	-	-	-	5 U	4.9 U
4-Chloroaniline	NA	-	-	-	-	-	-	-	5 U	4.9 U
4-Chlorophenyl phenyl ether	NA	-	-	-	-	-	-	-	2 U	2 U
4-Nitroaniline	NA	-	-	-	-	-	-	-	5 U	4.9 U
4-Nitrophenol	NA	-	-	-	-	-	-	-	9.9 U	9.8 U
Acenaphthene	NA	0.98 U	0.98 U	0.99 U	0.95 U	1 U	1 U	0.99 U	0.99 U	0.98 U
Acenaphthylene	NA	0.98 U	0.98 U	0.99 U	0.95 U	1 U	1 U	0.99 U	0.99 U	0.98 U
Aniline	NA	-	-	-	-	-	-	-	2 U	2 U
Anthracene	343	0.98 U	0.98 U	0.99 U	0.95 U	0.25 J	1 U	0.99 U	0.99 U	0.98 U
Benzidine	NA	-	-	-	-	-	-	-	9.9 U	9.8 UJ
Benzo(a)anthracene	NA	0.98 U	0.98 U	0.99 U	0.95 U	1 U	1 U	0.99 U	0.99 U	0.98 U
Benzo(a)pyrene	0.2	**0.98 U**	**0.98 U**	**0.99 U**	**0.95 U**	**1 U**	**1 U**	**0.99 U**	**0.99 U**	**0.98 U**
Benzo(b)fluoranthene	NA	0.98 U	0.98 U	0.99 U	0.95 U	1 U	1 U	0.99 U	0.99 U	0.98 U
Benzo(g,h,i)perylene	NA	0.98 U	0.98 U	0.99 U	0.95 U	1 U	1 U	0.99 U	0.99 U	0.98 U
Benzo(k)fluoranthene	NA	0.98 U	0.98 U	0.99 U	0.95 U	1 U	1 U	0.99 U	0.99 U	0.98 U
Benzoic acid	NA	-	-	-	-	-	-	-	20 U	20 U
Benzyl Alcohol	NA	-	-	-	-	-	-	-	2 U	2 U
bis(2-Chloroethoxy)methane	NA	-	-	-	-	-	-	-	2 U	2 U
bis(2-Chloroethyl)ether	NA	-	-	-	-	-	-	-	2 U	2 U
bis(2-Ethylhexyl)phthalate	6	-	-	-	-	-	-	-	2 U	1.7 J
Butyl benzylphthalate	NA	-	-	-	-	-	-	-	2 U	1.9 J
Carbazole	NA	-	-	-	-	-	-	-	0.99 U	0.98 U
Chrysene	NA	0.98 U	0.98 U	0.99 U	0.95 U	1 U	1 U	0.99 U	0.99 U	0.98 U
Dibenz(a,h)anthracene	NA	0.98 U	0.98 U	0.99 U	0.95 U	1 U	1 U	0.99 U	0.99 U	0.98 U
Dibenzofuran	NA	-	-	-	-	-	-	-	5 U	4.9 U
Diethyl phthalate	NA	-	-	-	-	-	-	-	2 U	1.1 J
Dimethyl phthalate	NA	-	-	-	-	-	-	-	2 U	2 U
Di-n-butylphthalate	NA	-	-	-	-	-	-	-	2 U	2 U
Di-n-octyl phthalate	NA	-	-	-	-	-	-	-	2 U	2 U
Fluoranthene	46	0.98 U	0.98 U	0.99 U	0.95 U	0.56 J	1 U	0.99 U	0.99 U	0.98 U
Fluorene	46	0.98 U	0.98 U	0.99 U	0.95 U	0.34 J	1 U	0.99 U	0.19 J	0.98 U
Hexachlorobenzene	1	-	-	-	-	-	-	-	0.99 U	0.98 U
Hexachlorobutadiene	NA	-	-	-	-	-	-	-	0.99 U	0.98 U
Hexachlorocyclopentadiene	50	-	-	-	-	-	-	-	9.9 U	9.8 U
Hexachloroethane	NA	-	-	-	-	-	-	-	2 U	2 U
Indeno(1,2,3-cd)pyrene	NA	0.98 U	0.98 U	0.99 U	0.95 U	1 U	1 U	0.99 U	0.99 U	0.98 U
Isophorone	NA	-	-	-	-	-	-	-	2 U	2 U
Naphthalene	0.5	**0.98 U**	**0.98 U**	**0.99 U**	**0.95 U**	0.36 J	**1 U**	**0.99 U**	**0.99 U**	**0.98 U**
Nitrobenzene	NA	-	-	-	-	-	-	-	2 U	2 U
N-Nitrosodimethylamine	NA	-	-	-	-	-	-	-	2 U	2 U
N-Nitrosodi-n-propylamine	NA	-	-	-	-	-	-	-	2 U	2 U
N-Nitrosodiphenylamine	NA	-	-	-	-	-	-	-	5 U	4.9 U
Pentachlorophenol	1	-	-	-	-	-	-	-	**4 U**	**3.9 U**
Phenanthrene	NA	0.98 U	0.98 U	0.99 U	0.95 U	2.2	1 U	0.54 J	0.41 J	0.98 U
Phenol	NA	-	-	-	-	-	-	-	2 U	2 U
Pyrene	NA	0.98 U	0.98 U	0.99 U	0.95 U	0.57 J	1 U	0.99 U	0.99 U	0.98 U
Pyridine	NA	-	-	-	-	-	-	-	2 U	2 U

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VERMONT YANKEE
VERNON, VERMONT

Location Name Sample Name Sample Date Lab Sample ID	VT ANR Proposed 2019 Groundwater Enforcement	DP1501 GW1501-20190514 05/14/2019 JC88348-2	DP1501 GW1501-20190514 DUP 05/14/2019 JC88348-3	DP1502 GW1502-20190426 04/26/2019 JC87127-1	DP1503 GW1503-20190515 05/16/2019 JC88303-3	DP1504 GW1504-20190426 04/26/2019 JC87127-2	DP1505 GW1505-20190510 05/10/2019 JC87972-4	DP1506 GW1506-20190426 04/26/2019 JC87127-3	DP1507 GW1507-20190426 04/26/2019 JC87127-4	DP1508 GW1508-20190513 05/13/2019 JC88348-1
Total Petroleum Hydrocarbons (ug/L)										
Total Petroleum Hydrocarbons (C10-C28) DRO	NA	-	-	-	-	-	-	-	83 U	83 UJ
Total Petroleum Hydrocarbons (C6-C10) GRO	NA	-	-	-	-	-	-	-	200 U	200 U
Inorganic Compounds (ug/L)										
Phosphorus, Dissolved	NA	-	-	-	-	-	-	-	-	-
Aluminum, Total	NA	29100	38600	303	12000	160000	1940000	110000	200 U	1400
Antimony, Total	NA	30 U	30 U	6 U	30 U	60 U	300 U	60 U	6 U	6 U
Arsenic, Total	10	**22**	**29.5**	3 U	**15 U**	**140**	**1260**	**148**	3 U	3 U
Barium, Total	2000	1000 U	1000 U	200 U	1000 U	2000 U	**10000 U**	1000 U	200 U	200 U
Beryllium, Total	4	**5 U**	**5 U**	1 U	**5 U**	**10 U**	**85**	**5 U**	1 U	1 U
Cadmium, Total	5	**15 U**	**15 U**	3 U	**15 U**	**30 U**	**150 U**	**15 U**	3 U	3 U
Calcium, Total	NA	33300	31300	18600	25000 U	50000 U	353000	36400	18000	21300
Chromium, Total	100	50 U	63.5	10 U	50 U	**289**	**4580**	**186**	10 U	10 U
Cobalt, Total	NA	250 U	250 U	50 U	250 U	500 U	2500 U	250 U	50 U	50 U
Copper, Total	1300	65.5	87	10 U	50 U	368	**6360**	261	10 U	10 U
Iron, Total	NA	43400 J	59200 J	571	11300	208000	3650000	213000	224	2140
Lead, Total	15	**16.5**	**19.5**	3 U	**18**	**160**	**1500 U**	**90.5**	3 U	3 U
Magnesium, Total	NA	25000 U	25000 U	5000 U	25000 U	50000 U	843000	42400	5000 U	5000 U
Manganese, Total	300	**832 J**	**1140 J**	85.7	**364**	**6570**	**91500**	**6500**	210	105
Mercury, Total	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1.2 U	0.2 U	0.2 U	0.2 U
Nickel, Total	100	50 U	59	10 U	50 U	**293**	**3220**	**261**	10 U	10 U
Potassium, Total	NA	50000 U	50000 U	10000 U	50000 U	133000	500000 U	50000 U	10000 U	10000 U
Selenium, Total	50	50 U	50 U	10 U	50 U	**100 U**	**500 U**	50 U	10 U	10 U
Silver, Total	NA	50 U	50 U	10 U	50 U	100 U	500 U	50 U	10 U	10 U
Sodium, Total	NA	50000 U	50000 U	128000	50000 U	229000	500000 U	50000 U	107000	51000
Thallium, Total	2	**50 U**	**50 U**	**10 U**	**50 U**	**100 U**	**500 U**	**50 U**	**10 U**	**10 U**
Vanadium, Total	NA	250 U	250 U	50 U	250 U	500 U	4320	250 U	50 U	50 U
Zinc, Total	NA	117 J	153 J	20 U	100 U	523	6740	449	20 U	20 UJ
PCBs (ug/L)										
Aroclor-1016 (PCB-1016)	NA	-	-	-	-	-	-	-	0.25 U	0.33 UJ
Aroclor-1221 (PCB-1221)	NA	-	-	-	-	-	-	-	0.25 U	0.33 UJ
Aroclor-1232 (PCB-1232)	NA	-	-	-	-	-	-	-	0.25 U	0.33 UJ
Aroclor-1242 (PCB-1242)	NA	-	-	-	-	-	-	-	0.25 U	0.33 UJ
Aroclor-1248 (PCB-1248)	NA	-	-	-	-	-	-	-	0.25 U	0.33 UJ
Aroclor-1254 (PCB-1254)	NA	-	-	-	-	-	-	-	0.25 U	0.33 UJ
Aroclor-1260 (PCB-1260)	NA	-	-	-	-	-	-	-	0.25 U	0.33 UJ
Aroclor-1262 (PCB-1262)	NA	-	-	-	-	-	-	-	0.25 U	0.33 UJ
Aroclor-1268 (PCB-1268)	NA	-	-	-	-	-	-	-	0.25 U	0.33 UJ
SUM of PCBs		-	-	-	-	-	-	-	ND	ND
Herbicides (ug/L)										
2,4,5-T	70	-	-	-	-	-	-	-	0.083 U	0.083 UJ
2,4,5-TP (Silvex)	50	-	-	-	-	-	-	-	0.083 U	0.083 UJ
2,4-Dichlorophenoxyacetic acid (2,4-D)	70	-	-	-	-	-	-	-	0.42 U	0.42 UJ
Dalapon	200	-	-	-	-	-	-	-	0.083 U	0.083 UJ
Dichloroprop	140	-	-	-	-	-	-	-	0.42 U	0.42 UJ
Dinoseb	7	-	-	-	-	-	-	-	0.42 U	0.42 UJ

TABLE 5.15-2
AOC 15 - COOLING TOWER AREA: GROUNDWATER ANALYTICAL RESULTS COMPARED TO GROUNDWATER ENFORCEMENT STANDARDS
VERMONT YANKEE
VERNON, VERMONT

Location Name Sample Name Sample Date Lab Sample ID	VT ANR Proposed 2019 Groundwater Enforcement	DP1501 GW1501-20190514 05/14/2019 JC88348-2	DP1501 GW1501-20190514 DUP 05/14/2019 JC88348-3	DP1502 GW1502-20190426 04/26/2019 JC87127-1	DP1503 GW1503-20190515 05/16/2019 JC88303-3	DP1504 GW1504-20190426 04/26/2019 JC87127-2	DP1505 GW1505-20190510 05/10/2019 JC87972-4	DP1506 GW1506-20190426 04/26/2019 JC87127-3	DP1507 GW1507-20190426 04/26/2019 JC87127-4	DP1508 GW1508-20190513 05/13/2019 JC88348-1
Pesticides (ug/L)										
4,4'-DDD	NA	-	-	-	-	-	-	-	0.0067 U	0.0067 UJ
4,4'-DDE	NA	-	-	-	-	-	-	-	0.0067 U	0.0067 UJ
4,4'-DDT	NA	-	-	-	-	-	-	-	0.0067 U	0.0067 UJ
Aldrin	0.1	-	-	-	-	-	-	-	0.0067 U	0.0067 UJ
alpha-BHC	NA	-	-	-	-	-	-	-	0.0067 U	0.0067 UJ
alpha-Chlordane	NA	-	-	-	-	-	-	-	0.0067 U	0.0067 UJ
beta-BHC	NA	-	-	-	-	-	-	-	0.0067 U	0.0067 UJ
delta-BHC	NA	-	-	-	-	-	-	-	0.0067 U	0.0067 UJ
Dieldrin	0.02	-	-	-	-	-	-	-	0.0067 U	0.0067 UJ
Endosulfan I	NA	-	-	-	-	-	-	-	0.0067 U	0.0067 UJ
Endosulfan II	NA	-	-	-	-	-	-	-	0.0067 U	0.0067 UJ
Endosulfan sulfate	NA	-	-	-	-	-	-	-	0.0067 U	0.0067 UJ
Endrin	2	-	-	-	-	-	-	-	0.0067 U	0.0067 UJ
Endrin aldehyde	NA	-	-	-	-	-	-	-	0.0067 U	0.0067 UJ
Endrin ketone	NA	-	-	-	-	-	-	-	0.0067 U	0.0067 UJ
gamma-BHC (Lindane)	0.2	-	-	-	-	-	-	-	0.0067 U	0.0067 UJ
gamma-Chlordane	NA	-	-	-	-	-	-	-	0.0067 U	0.0067 UJ
Heptachlor	0.4	-	-	-	-	-	-	-	0.0067 U	0.0067 UJ
Heptachlor epoxide	0.2	-	-	-	-	-	-	-	0.0067 U	0.0067 UJ
Methoxychlor	40	-	-	-	-	-	-	-	0.013 U	0.013 UJ
Toxaphene	3	-	-	-	-	-	-	-	0.17 U	0.17 UJ

ABBREVIATIONS AND NOTES:
-: Not Analyzed
J: valued is estimated
J+: valued is estimated with a potential high bias
mS/cm: milliSiemen per centimeter
mv: millivolt
NA: Not Applicable
NTU: Nephelometric Turbidiy Units
RSL: Risk-Based Screening Levels
U: Not detected, value is the laboratory reporting limit
ug/L: microgram per liter
USEPA: United States Environmental Protection Agency
VT ANR: Vermont Agency of Natural Resources

- Volatile and Semi-Volatile analytes detected in at least one sample are reported herein.
  For a complete list of analytes see the laboratory data sheets.
- Bold values indicate an exceedance of the VT ANR Proposed 2019 Groundwater
  Enforcement Standard.

TABLE 5.16-1
AOC 16 - RAILROAD LINES: SOIL ANALYTICAL RESULTS COMPARED TO RESIDENTIAL AND NON-RESIDENTIAL SOIL CRITERIA
VERMONT YANKEE
VERNON, VERMONT

Location Name Sample Name Sample Date Lab Sample ID Sample Depth (bgs)	VT ANR 2019 Proposed Residential Soil	VT ANR 2019 Proposed Non-Residential Soil	USEPA RSL Residential Soil HI = 1.0 May 2019	USEPA RSL Industrial Soil HI = 1.0 May 2019	SS1601 SS160100 05/06/2019 JC87876-1 0 - 1 (ft)	SS1602 SS160200 05/06/2019 JC87876-2 0 - 1 (ft)	SS1603 SS160300 05/06/2019 JC87876-3 0 - 1 (ft)	SS1604 SS160400 05/06/2019 JC87876-4 0 - 1 (ft)	SS1605 SS160500 05/06/2019 JC87876-5 0 - 1 (ft)	SS1606 SS160600 05/06/2019 JC87876-6 0 - 1 (ft)	SS1607 SS160700 05/06/2019 JC87876-7 0 - 1 (ft)	SS1608 SS160800 05/06/2019 JC87876-8 0 - 1 (ft)	SS1609 SS160900 05/06/2019 JC87876-9 0 - 1 (ft)	SS1610 SS161000 05/06/2019 JC87876-10 0 - 1 (ft)	SS1610 SS161000DUP 05/06/2019 JC87876-11 0 - 1 (ft)
Semi-Volatile Organic Compounds (mg/kg)															
Acenaphthene	NA	NA	3600	45000	0.041 U	0.039 U	0.036 U	0.035 U	0.0222 J	0.044 U	0.041 U	0.038 U	0.042 U	0.039 U	0.039 U
Acenaphthylene	NA	NA	NA	NA	0.041 U	0.039 U	0.036 U	0.035 U	0.0939	0.044 U	0.041 U	0.038 U	0.0782	0.0252 J	0.039 U
Anthracene	NA	NA	18000	230000	0.041 U	0.039 U	0.036 U	0.035 U	0.445	0.044 U	0.041 U	0.038 U	0.105	0.0351 J	0.0243 J
Benzo(a)anthracene	NA	NA	1.1	21	0.0296 J	0.039 U	0.0181 J	0.035 U	**1.4**	0.0293 J	0.041 U	0.0126 J	0.435	0.108	0.0653
Benzo(a)pyrene	0.07	1.54	0.11	2.1	0.0251 J	0.039 U	0.036 U	0.035 U	**0.798**	0.0244 J	0.041 U	0.038 U	**0.325**	**0.105**	0.066
Benzo(b)fluoranthene	NA	NA	1.1	21	0.0453	0.039 U	0.0275 J	0.035 U	**2**	0.0484	0.041 U	0.0327 J	0.734	0.295	0.176
Benzo(g,h,i)perylene	NA	NA	NA	NA	0.041 U	0.039 U	0.036 U	0.035 U	0.427	0.044 U	0.041 U	0.038 U	0.228	0.0856	0.0611
Benzo(k)fluoranthene	NA	NA	11	210	0.041 U	0.039 U	0.036 U	0.035 U	0.64	0.044 U	0.041 U	0.038 U	0.263	0.0929	0.0612
Chrysene	NA	NA	110	2100	0.0313 J	0.039 U	0.0204 J	0.035 U	2.11	0.0425 J	0.041 U	0.0225 J	0.477	0.214	0.129
Dibenz(a,h)anthracene	NA	NA	0.11	2.1	0.041 U	0.039 U	0.036 U	0.035 U	**0.118**	0.044 U	0.041 U	0.038 U	0.0682	0.0196 J	0.039 U
Fluoranthene	2301	26371	2400	30000	0.0512	0.039 U	0.0377	0.035 U	3.92	0.0535	0.0217 J	0.0366 J	0.768	0.449 J	0.253 J
Fluorene	2301	26371	2400	30000	0.041 U	0.039 U	0.036 U	0.035 U	0.0306 J	0.044 U	0.041 U	0.038 U	0.042 U	0.039 U	0.039 U
Indeno(1,2,3-cd)pyrene	NA	NA	1.1	21	0.041 U	0.039 U	0.036 U	0.035 U	0.535	0.044 U	0.041 U	0.038 U	0.293	0.13	0.1
Naphthalene	2.7	16	3.8	17	0.041 U	0.039 U	0.036 U	0.035 U	0.044 U	0.044 U	0.041 U	0.038 U	0.042 U	0.039 U	0.039 U
Phenanthrene	NA	NA	NA	NA	0.041 U	0.039 U	0.036 U	0.035 U	0.379	0.044 U	0.041 U	0.038 U	0.0473	0.0763	0.0392
Pyrene	NA	NA	1800	23000	0.0486	0.0131 J	0.0322 J	0.035 U	3.14	0.0467	0.0176 J	0.0264 J	0.693	0.334	0.188
Benzo(a)Pyrene Equivalent (ND = 0 RL)	0.07	1.54	NA	NA	0.033	ND	0.0046	ND	**1.3**	0.032	ND	0.0046	**0.54**	**0.18**	**0.10**
Benzo(a)Pyrene Equivalent (ND = 1/2 RL)	0.07	1.54	NA	NA	0.055	ND	0.025	ND	**1.3**	0.057	ND	0.045	**0.54**	**0.18**	**0.12**
Other															
Total Solids (%)	NA	NA	NA	NA	80.5	84.4	92.1	93.2	75.5	75.4	78.2	86.8	78.2	84	85.1
Herbicides (mg/kg)															
2,4,5-T	NA	NA	630	8200	0.0041 U	0.0039 U	0.0035 U	0.0034 U	0.0044 U	0.0043 U	0.0042 U	0.0038 U	0.0042 U	0.0039 U	0.0036 U
2,4,5-TP (Silvex)	NA	NA	510	6600	0.0041 U	0.0039 U	0.0035 U	0.0034 U	0.0044 U	0.0043 U	0.0042 U	0.0038 U	0.0042 U	0.0039 U	0.0036 U
2,4-Dichlorophenoxyacetic acid (2,4-D)	NA	NA	700	9600	0.021 U	0.02 U	0.018 U	0.017 U	0.022 U	0.021 U	0.021 U	0.019 U	0.021 U	0.02 U	0.018 U
Dalapon	NA	NA	1900	25000	0.0041 U	0.0039 U	0.0035 U	0.0034 U	0.0044 U	0.0043 U	0.0042 U	0.0038 U	0.0042 U	0.0039 U	0.0036 U
Dichloroprop	NA	NA	NA	NA	0.021 U	0.02 U	0.018 U	0.017 U	0.022 U	0.021 U	0.021 U	0.019 U	0.021 U	0.02 U	0.018 U
Dinoseb	NA	NA	63	820	0.021 U	0.02 U	0.018 U	0.017 U	0.022 U	0.021 U	0.021 U	0.019 U	0.021 U	0.02 U	0.018 U

TABLE 5.16-1
AOC 16 - RAILROAD LINES: SOIL ANALYTICAL RESULTS COMPARED TO RESIDENTIAL AND NON-RESIDENTIAL SOIL CRITERIA
VERMONT YANKEE
VERNON, VERMONT

Location Name Sample Name Sample Date Lab Sample ID Sample Depth (bgs)	VT ANR 2019 Proposed Residential Soil	VT ANR 2019 Proposed Non-Residential Soil	USEPA RSL Residential Soil HI = 1.0 May 2019	USEPA RSL Industrial Soil HI = 1.0 May 2019	SS1601 SS160100 05/06/2019 JC87876-1 0 - 1 (ft)	SS1602 SS160200 05/06/2019 JC87876-2 0 - 1 (ft)	SS1603 SS160300 05/06/2019 JC87876-3 0 - 1 (ft)	SS1604 SS160400 05/06/2019 JC87876-4 0 - 1 (ft)	SS1605 SS160500 05/06/2019 JC87876-5 0 - 1 (ft)	SS1606 SS160600 05/06/2019 JC87876-6 0 - 1 (ft)	SS1607 SS160700 05/06/2019 JC87876-7 0 - 1 (ft)	SS1608 SS160800 05/06/2019 JC87876-8 0 - 1 (ft)	SS1609 SS160900 05/06/2019 JC87876-9 0 - 1 (ft)	SS1610 SS161000 05/06/2019 JC87876-10 0 - 1 (ft)	SS1610 SS161000DUP 05/06/2019 JC87876-11 0 - 1 (ft)
Pesticides (mg/kg)															
4,4'-DDD	NA	NA	1.9	9.6	0.00081 U	0.00078 U	0.00071 U	0.0007 U	0.00087 U	0.00084 U	0.00083 U	0.00074 U	0.00081 U	0.00077 U	0.00076 U
4,4'-DDE	NA	NA	2	9.3	0.00081 U	0.00078 U	0.00071 U	0.0007 U	0.00087 U	0.00084 U	0.004	0.00074 U	0.00081 U	0.00077 U	0.00076 U
4,4'-DDT	NA	NA	1.9	8.5	0.00081 U	0.00078 U	0.00071 U	0.0007 U	0.00087 U	0.00089	0.0026	0.00074 U	0.00081 U	0.00077 U	0.00076 U
Aldrin	0.02	0.1	0.039	0.18	0.00081 U	0.00078 U	0.00071 U	0.0007 U	0.00087 U	0.00084 U	0.00083 U	0.00074 U	0.00081 U	0.00077 U	0.00076 U
alpha-BHC	NA	NA	0.086	0.36	0.00081 U	0.00078 U	0.00071 U	0.0007 U	0.00087 U	0.00084 U	0.00083 U	0.00074 U	0.00081 U	0.00077 U	0.00076 U
alpha-Chlordane	NA	NA	NA	NA	0.00081 U	0.00078 U	0.00071 U	0.0007 U	0.00087 U	0.00084 U	0.00083 U	0.00074 U	0.00081 U	0.00077 U	0.00076 U
beta-BHC	NA	NA	0.3	1.3	0.00081 U	0.00078 U	0.00071 U	0.0007 U	0.00087 U	0.00084 U	0.00083 U	0.00074 U	0.00081 U	0.00077 U	0.00076 U
delta-BHC	NA	NA	NA	NA	0.00081 U	0.00078 U	0.00071 U	0.0007 U	0.00087 U	0.00084 U	0.00083 U	0.00074 U	0.00081 U	0.00077 U	0.00076 U
Dieldrin	NA	NA	0.034	0.14	0.00081 U	0.00078 U	0.00071 U	0.0007 U	0.00087 U	0.00084 U	0.00083 U	0.00074 U	0.00081 U	0.00077 U	0.00076 U
Endosulfan I	NA	NA	NA	NA	0.00081 U	0.00078 U	0.00071 U	0.0007 U	0.00087 U	0.00084 U	0.00083 U	0.00074 U	0.00081 U	0.00077 U	0.00076 U
Endosulfan II	NA	NA	NA	NA	0.00081 U	0.00078 U	0.00071 U	0.0007 U	0.00087 U	0.00084 U	0.00083 U	0.00074 U	0.00081 U	0.00077 U	0.00076 U
Endosulfan sulfate	NA	NA	380	4900	0.00081 U	0.00078 U	0.00071 U	0.0007 U	0.00087 U	0.00084 U	0.00083 U	0.00074 U	0.00081 U	0.00077 U	0.00076 U
Endrin	NA	NA	19	250	0.00081 U	0.00078 U	0.00071 U	0.0007 U	0.00087 U	0.00084 U	0.00083 U	0.00074 U	0.00081 U	0.00077 U	0.00076 U
Endrin aldehyde	NA	NA	NA	NA	0.00081 U	0.00078 U	0.00071 U	0.0007 U	0.00087 U	0.00084 U	0.00083 U	0.00074 U	0.00081 U	0.00077 U	0.00076 U
Endrin ketone	NA	NA	NA	NA	0.00081 U	0.00078 U	0.00071 U	0.0007 U	0.00087 U	0.00084 U	0.00083 U	0.00074 U	0.00081 U	0.00077 U	0.00076 U
gamma-BHC (Lindane)	NA	NA	0.57	2.5	0.00081 U	0.00078 U	0.00071 U	0.0007 U	0.00087 U	0.00084 U	0.00083 U	0.00074 U	0.00081 U	0.00077 U	0.00076 U
gamma-Chlordane	NA	NA	NA	NA	0.00081 U	0.00078 U	0.00071 U	0.0007 U	0.00087 U	0.00084 U	0.00083 U	0.00074 U	0.00081 U	0.00077 U	0.00076 U
Heptachlor	NA	NA	0.13	0.63	0.00081 U	0.00078 U	0.00071 U	0.0007 U	0.00087 U	0.00084 U	0.00083 U	0.00074 U	0.00081 U	0.00077 U	0.00076 U
Heptachlor epoxide	NA	NA	0.07	0.33	0.00081 U	0.00078 U	0.00071 U	0.0007 U	0.00087 U	0.00084 U	0.00083 U	0.00074 U	0.00081 U	0.00077 U	0.00076 U
Methoxychlor	NA	NA	320	4100	0.0016 U	0.0016 U	0.0014 U	0.0014 U	0.0017 U	0.0017 U	0.0017 U	0.0015 U	0.0016 U	0.0015 U	0.0015 U
Toxaphene	NA	NA	0.49	2.1	0.02 U	0.02 U	0.018 U	0.018 U	0.022 U	0.021 U	0.021 U	0.018 U	0.02 U	0.019 U	0.019 U

ABBREVIATIONS AND NOTES:
-: Not Analyzed
*: Outside of QC limits
J: value is estimated
mg/kg: milligram per kilogram
NA: Not Applicable
RSL: Risk-Based Screening Levels
U: Not detected, value is the laboratory reporting limit
VT ANR: Vermont Agency of Natural Resources
USEPA: United State Environmental Protection Agency

- Volatile and Semi-Volatile analytes detected in at least one sample are reported herein. For a complete list of analytes see the laboratory data sheets.
- Bold values indicate an exceedance of the Proposed 2019 VT ANR Residential Soil values and the USEPA May 2019 Residential Soil RSL where no VT ANR value is available.
- Italicized values indicate an exceedance of the Proposed 2019 VT ANR Non-Residential Soil values and the USEPA May 2019 Industrial Soil RSL where no VT ANR value is available.

TABLE 6-1
MONITORING WELL CONSTRUCTION SUMMARY
NON-RADIOLOGICAL SITE INVESTIGATION
VERMONT YANKEE NUCLEAR POWER STATION
VERNON, VERMONT

Well ID	Installation Date	Drilling Method	Total Boring Depth (ft bgs)	Screened Interval (ft bgs)	Origin of Screened Material	Reference Elevation (ft)
GZ-1S	11/14/2007	HSA	28	17-27	Natural	253.64
GZ-2S	2/1/2010	HSA	43	33-43	Fill	251.04
GZ-3S	11/13/2007	HSA	37	20-35	Fill	251
GZ-4S	1/26/2010	HSA	39	27-37	Natural	251.54
GZ-5S	11/13/2007	HSA	37	22-37	Natural	253.78
GZ-6S	1/26/2010	HSA	32	22-32	Fill	251.28
GZ-7S	2/2/2010	HSA	28.8	18-28.3	Natural	251.9
GZ-8S	2/5/2010	HSA	13.5	8-13	Natural	251.54
GZ-9S	2/1/2010	HSA	28	18-28	Natural	250.91
GZ-10S	2/5/2010	HSA	27	15-25	Natural	252.02
GZ-11S	2/3/2010	HSA	31	20-29.5	Fill	250.86
GZ-12S	2/4/2010	HSA	32	20-30	Fill	251.33
GZ-12D	10/12/2010	Cased	62	56-61	Natural	251.43
GZ-13S	2/4/2010	HSA	26	15-25	Fill	240.72
GZ-13D	2/18/2010	Cased	51.9	48.5-50.5	Natural	240.34
GZ-14S	1/27/2010	HSA	37	35-35	Natural	251.91
GZ-14D	2/20/2010	Cased	79	68-78	Natural	251.77
GZ-15S	2/12/2010	HSA	33.8	22-32	Natural	251.61
GZ-16S	3/2/2010	HSA	35	23-33	Natural	251.31
GZ-17S	2/27/2010	Cased	28	16-26	Natural	251.76
GZ-18S	9/9/2010	Cased	21	10.9-20.9	Fill	236.64
GZ-18D	9/15/2010	Cased	53	46-51	Natural	237.1
GZ-19S	2/22/2010	HSA	37	25-35	Natural	254.54
GZ-19D	2/24/2010	Cased	43.8	40.3-43.3	Natural	254.24
GZ-20S	3/6/2010	Cased	27	19-27	Natural	251.53
GZ-21S	3/12/2010	Cased	27	16.5-26.5	Natural	250.9
GZ-22D	10/19/2010	Cased	70.5	60-70	Natural	251.4
GZ-23S	10/14/2010	Vac Ex	33	23-33	Fill	251.58
GZ-24S	10/14/2010	Vac Ex	30.5	20.5-30.5	Fill	251.3
GZ-25S	10/19/2010	HSA	32	20-30	Natural	251.56
GZ-26S	10/20/2010	HSA	31	19-29	Natural	251.42
GZ-27S	10/20/2010	HSA	32	20-30	Natural	248.91
1101	--	--	30.05	--	--	253.47
1102	--	--	30.41	--	--	251.36
1201	--	--	26.3	--	--	254.38
1202	--	--	17.62	--	--	253.71
1203	--	--	27.29	--	--	255.29
1204	--	--	27.12	--	--	254.71
1301R	--	--	27.65	--	--	254.25

TABLE 6-1
MONITORING WELL CONSTRUCTION SUMMARY
NON-RADIOLOGICAL SITE INVESTIGATION
VERMONT YANKEE NUCLEAR POWER STATION
VERNON, VERMONT

Well ID	Installation Date	Drilling Method	Total Boring Depth (ft bgs)	Screened Interval (ft bgs)	Origin of Screened Material	Reference Elevation (ft)
1302	--	--	30.14	--	--	253.51
1302R	--	--	31.68	--	--	252.16
1303	--	--	26.51	--	--	253.52
2101	--	--	17.34	--	--	254.51
2102	--	--	15.42	--	--	255.98
2201	--	--	16.01	--	--	254.37
2202	--	--	17.5	--	--	252.89
3201	--	--	17.05	--	--	254.6
3301	--	--	31.68	--	--	253.84
3302	--	--	31.83	--	--	253.46
3401	--	--	28.72	--	--	253.89
221	--	--	17.73	--	--	263.29
221A	--	--	21.22	--	--	262.49
4201	--	--	17.3	--	--	259.68
4202	--	--	23.26	--	--	260.00
6201	--	--	10.81	--	--	264.26
6202	--	--	13.68	--	--	265.97
6203	--	--	16.15	--	--	268.49
201	--	--	36.29	--	--	264.5
202	--	--	23.85	--	--	262.58
203	--	--	39.01	--	--	257.28
204	--	--	40.59	--	--	257.36
NEOB Well	--	--	500	--	--	--
South West Well	--	--	500	--	--	--
West Well	--	--	555	--	--	--

Notes:
HSA: Hollow-stem auger used to install the well
Casing: Casing was driven to install the well
Vac Ex: Vacuum used to excavate soils for well installation
ft bgs: Feet below ground surface
Reference Elevation: Elevation from top of well PVC riser

TABLE 6-2
GROUNDWATER ELEVATION DATA
NON-RADIOLOGICAL SITE INVESTIGATION
VERMONT YANKEE NUCLEAR POWER STATION
VERNON, VERMONT

Well ID	Installation Date	Total Boring Depth (ft bgs)	Screened Interval (ft bgs)	Reference Elevation (ft)	March 2019 Depth to Groundwater from Reference Point (ft)	March 2019 Groundwater Elevation (ft)	June 2019 Depth to Groundwater from Reference Point (ft)	June 2019 Groundwater Elevation (ft)
GZ-1S	11/14/2007	28	17-27	253.64	NM	ND	22.45	231.19
GZ-2S	2/1/2010	43	33-43	251.04	21.59	229.45	21.24	229.80
GZ-3S	11/13/2007	37	20-35	251	28.18	222.82	28.13	222.87
GZ-4S	1/26/2010	39	27-37	251.54	29.45	222.09	29.38	222.16
GZ-5S	11/13/2007	37	22-37	253.78	33.30	220.48	33.19	220.59
GZ-6S	1/26/2010	32	22-32	251.28	21.82	229.46	21.56	229.72
GZ-7S	2/2/2010	28.8	18-28.3	251.9	20.43	231.47	20.44	231.46
GZ-8S	2/5/2010	13.5	8-13	251.54	12.21	239.33	12.38	239.16
GZ-9S	2/1/2010	28	18-28	250.91	19.08	231.83	19.12	231.79
GZ-10S	2/5/2010	27	15-25	252.02	19.92	232.10	19.91	232.11
GZ-11S	2/3/2010	31	20-29.5	250.86	19.52	231.34	19.56	231.30
GZ-12S	2/4/2010	32	20-30	251.33	22.12	229.21	22.11	229.22
GZ-12D	10/12/2010	62	56-61	251.43	23.30	228.13	24.30	227.13
GZ-13S	2/4/2010	26	15-25	240.72	16.10	224.62	15.41	225.31
GZ-13D	2/18/2010	51.9	48.5-50.5	240.34	20.31	220.03	20.45	219.89
GZ-14S	1/27/2010	37	35-35	251.91	27.89	224.02	27.58	224.33
GZ-14D	2/20/2010	79	68-78	251.77	32.32	219.45	32.73	219.04
GZ-15S	2/12/2010	33.8	22-32	251.61	21.85	229.76	21.84	229.77
GZ-16S	3/2/2010	35	23-33	251.31	23.21	228.10	NM	ND
GZ-17S	2/27/2010	28	16-26	251.76	19.94	231.82	20.00	231.76
GZ-18S	9/9/2010	21	10.9-20.9	236.64	12.41	224.23	12.02	224.62
GZ-18D	9/15/2010	53	46-51	237.1	16.65	220.45	16.80	220.30
GZ-19S	2/22/2010	37	25-35	254.54	25.93	228.61	26.10	228.44
GZ-19D	2/24/2010	43.8	40.3-43.3	254.24	26.05	228.19	27.63	226.61
GZ-20S	3/6/2010	27	19-27	251.53	19.76	231.77	19.81	231.72
GZ-21S	3/12/2010	27	16.5-26.5	250.9	19.68	231.22	19.86	231.04
GZ-22D	10/19/2010	70.5	60-70	251.4	27.85	223.55	28.10	223.30
GZ-23S	10/14/2010	33	23-33	251.58	23.51	228.07	23.11	228.47
GZ-24S	10/14/2010	30.5	20.5-30.5	251.3	20.74	230.56	20.47	230.83
GZ-25S	10/19/2010	32	20-30	251.56	20.44	231.12	20.35	231.21
GZ-26S	10/20/2010	31	19-29	251.42	19.22	232.20	19.11	232.31
GZ-27S	10/20/2010	32	20-30	248.91	25.05	223.86	24.90	224.01

TABLE 6-2
GROUNDWATER ELEVATION DATA
NON-RADIOLOGICAL SITE INVESTIGATION
VERMONT YANKEE NUCLEAR POWER STATION
VERNON, VERMONT

Well ID	Installation Date	Total Boring Depth (ft bgs)	Screened Interval (ft bgs)	Reference Elevation (ft)	March 2019 Depth to Groundwater from Reference Point (ft)	March 2019 Groundwater Elevation (ft)	June 2019 Depth to Groundwater from Reference Point (ft)	June 2019 Groundwater Elevation (ft)
1101	--	30.05	--	253.47	19.41	234.06	19.42	234.05
1102	--	30.41	--	251.36	21.76	229.60	21.59	229.77
1201	--	26.3	--	254.38	21.43	232.95	21.31	233.07
1202	--	17.62	--	253.71	Dry	N/A	Dry	N/A
1203	--	27.29	--	255.29	22.44	232.85	22.32	232.97
1204	--	27.12	--	254.71	21.75	232.96	21.63	233.08
1301R	--	27.65	--	254.25	20.97	233.28	20.86	233.39
1302	--	30.14	--	253.51	20.61	232.90	20.48	233.03
1302R	--	31.68	--	252.16	19.57	232.59	19.43	232.73
1303	--	26.51	--	253.52	20.46	233.06	20.38	233.14
2101	--	17.34	--	254.51	8.49	246.02	10.87	243.64
2102	--	15.42	--	255.98	Dry	N/A	Dry	N/A
2201	--	16.01	--	254.37	Dry	N/A	Dry	N/A
2202	--	17.5	--	252.89	Dry	N/A	Dry	N/A
3201	--	17.05	--	254.6	Dry	N/A	Dry	N/A
3301	--	31.68	--	253.84	20.86	232.98	20.83	233.01
3302	--	31.83	--	253.46	20.72	232.74	20.58	232.88
3401	--	28.72	--	253.89	20.60	233.29	20.52	233.37
221	--	17.73	--	263.29	NM	ND	11.41	251.88
221A	--	21.22	--	262.49	NM	ND	12.15	250.34
4201	--	17.3	--	259.68	Dry	N/A	Dry	N/A
4202	--	23.26	--	260.00	Dry	N/A	Dry	N/A
6201	--	10.81	--	264.26	6.60	257.66	7.23	257.03
6202	--	13.68	--	265.97	8.28	257.69	8.88	257.09
6203	--	16.15	--	268.49	12.72	255.77	12.55	255.94
201	--	36.29	--	264.5	31.00	233.50	31.08	233.42
202	--	23.85	--	262.58	17.20	245.38	17.87	244.71
203	--	39.01	--	257.28	34.35	222.93	34.52	222.76
204	--	40.59	--	257.36	34.34	223.02	34.47	222.89

Notes:
NM: Not measured
ND: Not determined/unknown
ft bgs: Feet below ground surface
Reference Elevation: Elevation from top of well PVC riser, with exception of 1102 which was measured from top of casing.

TABLE 6-3
SUMMARY OF GROUNDWATER ANALYTICAL DATA
VERMONT YANKEE
VERNON, VERMONT

Location Name	VT ANR	101	1101	1102	1302R	1303	1303	201	201	202	202	203	204	204	3301	GZ-11S	GZ-12D	GZ-12S	GZ-13D	GZ-13D	GZ-13S	GZ-14D
Sample Name	Proposed 2019	101-20190502	1101-20190430	1102-20190501	1302R-20190501	1303-20190501	1303DUP-20190501	201-20190425	201-20190507	202-20190426	202-20190507	203-20190429	204-20190429	204-20190517	3301-20190507	GZ-11S-20190509	GZ-12D-20190513	GZ-12S-20190510	GZ-13D-20190509	GZ-13D-20190509 DUP	GZ-13S-20190508	GZ-14D-20190507
Sample Date	Groundwater	05/02/2019	04/30/2019	05/01/2019	05/01/2019	05/01/2019	05/01/2019	04/25/2019	05/07/2019	04/26/2019	05/07/2019	04/29/2019	04/29/2019	05/17/2019	05/07/2019	05/09/2019	05/13/2019	05/10/2019	05/09/2019	05/09/2019	05/08/2019	05/07/2019
Lab Sample ID	Enforcement Standard	JC87575-2	JC87448-7	JC87575-4	JC87448-11	JC87448-10	JC87448-12	JC87448-3	JC87858-8	JC87448-4	JC87858-9	JC87448-1	JC87448-2	JC88413-1	JC87858-7	JC87965-4	JC88347-1	JC87965-6	JC87965-2	JC87965-3	JC87858-3	JC87858-6
Volatile Organic Compounds (ug/L)																						
1,1,1,2-Tetrachloroethane	70	1 U	1 U	1 U	1 U	1 U	1 U	1 U	-	1 U	-	1 U	1 U	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,1-Trichloroethane	200	1 U	1 U	1 U	1 U	1 U	1 U	1 U	-	1 U	-	1 U	1 U	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	-	1 U	-	1 U	1 U	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	-	1 U	-	1 U	1 U	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	70	1 U	1 U	1 U	1 U	1 U	1 U	1 U	-	1 U	-	1 U	1 U	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	7	1 U	1 U	1 U	1 U	1 U	1 U	1 U	-	1 U	-	1 U	1 U	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloropropene	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	-	1 U	-	1 U	1 U	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2,3-Trichlorobenzene	0.9	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	-	**1 U**	-	**1 U**	**1 U**	-	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**
1,2,3-Trichloropropane	0.02	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	-	**2 U**	-	**2 U**	**2 U**	-	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**
1,2,4-Trichlorobenzene	70	1 U	1 U	1 U	1 U	1 U	1 U	1 U	-	1 U	-	1 U	1 U	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2,4-Trimethylbenzene	23	2 U	2 U	2 U	2 U	2 U	2 U	2 U	-	2 U	-	2 U	2 U	-	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,2-Dibromo-3-chloropropane (DBCP)	0.2	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	-	**2 U**	-	**2 U**	**2 U**	-	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**
1,2-Dibromoethane (Ethylene Dibromide)	0.05	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	-	**1 U**	-	**1 U**	**1 U**	-	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**
1,2-Dichlorobenzene	600	1 U	1 U	1 U	1 U	1 U	1 U	1 U	-	1 U	-	1 U	1 U	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	-	1 U	-	1 U	1 U	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloropropane	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	-	1 U	-	1 U	1 U	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,3,5-Trimethylbenzene	23	2 U	2 U	2 U	2 U	2 U	2 U	2 U	-	2 U	-	2 U	2 U	-	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,3-Dichlorobenzene	600	1 U	1 U	1 U	1 U	1 U	1 U	1 U	-	1 U	-	1 U	1 U	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,3-Dichloropropane	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	-	1 U	-	1 U	1 U	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	75	1 U	1 U	1 U	1 U	1 U	1 U	1 U	-	1 U	-	1 U	1 U	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2,2-Dichloropropane	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	-	1 U	-	1 U	1 U	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2-Butanone (Methyl Ethyl Ketone)	511	10 U	10 U	10 U	10 U	10 U	10 U	10 U	-	10 U	-	10 U	10 U	-	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Chlorotoluene	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U	-	2 U	-	2 U	2 U	-	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
2-Phenylbutane (sec-Butylbenzene)	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U	-	2 U	-	2 U	2 U	-	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
4-Chlorotoluene	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U	-	2 U	-	2 U	2 U	-	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	NA	5 U	5 U	5 U	5 U	5 U	5 U	5 U	-	5 U	-	5 U	5 U	-	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Acetone	950	10 U	10 U	10 U	10 U	10 U	10 U	10 U	-	10 U	-	10 U	10 U	-	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzene	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	-	0.5 U	-	0.5 U	0.5 U	-	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Bromobenzene	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	-	1 U	-	1 U	1 U	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromodichloromethane	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	-	1 U	-	1 U	1 U	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromoform	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	-	1 U	-	1 U	1 U	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromomethane (Methyl Bromide)	5	2 U	2 UJ	2 U	2 UJ	2 UJ	2 UJ	2 UJ	-	2 UJ	-	2 UJ	2 UJ	-	2 U	2 U	2 U	2 U	2 UJ	2 U	2 U	2 U
Carbon tetrachloride	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	-	1 U	-	1 U	1 U	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	100	1 U	1 U	1 U	1 U	1 U	1 U	1 U	-	1 U	-	1 U	1 U	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobromomethane	8	1 U	1 U	1 U	1 U	1 U	1 U	1 U	-	1 U	-	1 U	1 U	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroethane	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	-	1 U	-	1 U	1 U	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroform (Trichloromethane)	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	-	1 U	-	1 U	1 U	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloromethane (Methyl Chloride)	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	-	1 U	-	1 U	1 U	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
cis-1,2-Dichloroethene	70	1 U	1 U	1 U	1 U	1 U	1 U	1 U	-	1 U	-	1 U	1 U	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
cis-1,3-Dichloropropene	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	-	1 U	-	1 U	1 U	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Cymene (p-Isopropyltoluene)	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U	-	2 U	-	2 U	2 U	-	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Dibromochloromethane	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	-	1 U	-	1 U	1 U	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Dibromomethane	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	-	1 U	-	1 U	1 U	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Dichlorodifluoromethane (CFC-12)	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U	-	2 U	-	2 U	2 U	-	2 U	2 U	2 U	2 U	2.3	2.2	2 U	2 U
Ethylbenzene	700	1 U	1 U	1 U	1 U	1 U	1 U	1 U	-	1 U	-	1 U	1 U	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Hexachlorobutadiene	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U	-	2 U	-	2 U	2 U	-	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Isopropylbenzene (Cumene)	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	-	1 U	-	1 U	1 U	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
m,p-Xylenes	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	-	1 U	-	1 U	1 U	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Methyl Tert Butyl Ether	11	1 U	1 U	1 U	1 U	1 U	1 U	1 U	-	1 U	-	1 U	1 U	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Methylene chloride	5	2 U	2 U	2 U	2 U	2 U	2 U	2 U	-	2 U	-	2 U	2 U	-	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Naphthalene	0.5	**5 U**	**5 U**	**5 U**	**5 U**	**5 U**	**5 U**	**5 U**	-	**5 U**	-	**5 U**	**5 U**	-	**5 U**	**5 U**	**5 U**	**5 U**	**5 U**	**5 U**	**5 U**	**5 U**
n-Butylbenzene	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U	-	2 U	-	2 U	2 U	-	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
n-Propylbenzene	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U	-	2 U	-	2 U	2 U	-	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
o-Xylene	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	-	1 U	-	1 U	1 U	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Styrene	100	1 U	1 U	1 U	1 U	1 U	1 U	1 U	-	1 U	-	1 U	1 U	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
tert-Butylbenzene	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U	-	2 U	-	2 U	2 U	-	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Tetrachloroethene	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	-	1 U	-	1 U	1 U	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	1000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	-	1 U	-	1 U	1 U	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,2-Dichloroethene	100	1 U	1 U	1 U	1 U	1 U	1 U	1 U	-	1 U	-	1 U	1 U	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,3-Dichloropropene	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	-	1 U	-	1 U	1 U	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	-	1 U	-	1 U	1 U	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichlorofluoromethane (CFC-11)	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U	-	2 U	-	2 U	2 U	-	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Vinyl chloride	2	1 U	1 U	1 U	1 U	1 U	1 U	1 U	-	1 U	-	1 U	1 U	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Xylene (total)	10000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	-	1 U	-	1 U	1 U	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U

TABLE 6-3
SUMMARY OF GROUNDWATER ANALYTICAL DATA
VERMONT YANKEE
VERNON, VERMONT

Location Name	VT ANR	101	1101	1102	1302R	1303	1303	201	201	202	202	203	204	204	3301	GZ-11S	GZ-12D	GZ-12S	GZ-13D	GZ-13D	GZ-13S	GZ-14D
Sample Name	Proposed 2019	101-20190502	1101-20190430	1102-20190501	1302R-20190501	1303-20190501	1303DUP-20190501	201-20190425	201-20190507	202-20190426	202-20190507	203-20190429	204-20190429	204-20190517	3301-20190507	GZ-11S-20190509	GZ-12D-20190513	GZ-12S-20190510	GZ-13D-20190509	GZ-13D-20190509 DUP	GZ-13S-20190508	GZ-14D-20190507
Sample Date	Groundwater	05/02/2019	04/30/2019	05/01/2019	05/01/2019	05/01/2019	05/01/2019	04/25/2019	05/07/2019	04/26/2019	05/07/2019	04/29/2019	04/29/2019	05/17/2019	05/07/2019	05/09/2019	05/13/2019	05/10/2019	05/09/2019	05/09/2019	05/08/2019	05/07/2019
Lab Sample ID	Enforcement Standard	JC87575-2	JC87448-7	JC87575-4	JC87448-11	JC87448-10	JC87448-12	JC87448-3	JC87858-8	JC87448-4	JC87858-9	JC87448-1	JC87448-2	JC88413-1	JC87858-7	JC87965-4	JC88347-1	JC87965-6	JC87965-2	JC87965-3	JC87858-3	JC87858-6
Semi-Volatile Organic Compounds (ug/L)																						
1,2,4-Trichlorobenzene	70	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	600	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Diphenylhydrazine	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	600	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2'-oxybis(1-Chloropropane)	46	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,5-Trichlorophenol	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dichlorophenol	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrophenol	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrotoluene	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,6-Dinitrotoluene	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Chloronaphthalene	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Chlorophenol	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylphenol (o-Cresol)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Nitroaniline	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Nitrophenol	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3&4-Methylphenol	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,3'-Dichlorobenzidine	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3-Nitroaniline	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4,6-Dinitro-2-methylphenol	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Bromophenyl phenyl ether	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chloro-3-methylphenol	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chloroaniline	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chlorophenyl phenyl ether	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Nitroaniline	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Nitrophenol	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	NA	0.98 U	0.95 U	1 U	0.98 U	0.95 U	0.95 U	-	0.98 U	-	0.98 U	0.97 U	-	1 U	0.99 U	0.99 U	0.96 U	0.98 U	0.98 U	1 U	1 U	0.97 U
Acenaphthylene	NA	0.98 U	0.95 U	1 U	0.98 U	0.95 U	0.95 U	-	0.98 U	-	0.98 U	0.97 U	-	1 U	0.99 U	0.99 U	0.96 U	0.98 U	0.98 U	1 U	1 U	0.97 U
Aniline	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	343	0.98 U	0.95 U	1 U	0.98 U	0.95 U	0.95 U	-	0.98 U	-	0.98 U	0.97 U	-	1 U	0.99 U	0.99 U	0.96 U	0.98 U	0.98 U	1 U	1 U	0.97 U
Benzidine	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	NA	0.98 U	0.95 U	1 U	0.98 U	0.95 U	0.95 U	-	0.98 U	-	0.98 U	0.97 U	-	1 U	0.99 U	0.99 U	0.96 U	0.98 U	0.98 U	1 U	1 U	0.97 U
Benzo(a)pyrene	0.2	**0.98 U**	**0.95 U**	**1 U**	**0.98 U**	**0.95 U**	**0.95 U**	-	**0.98 U**	-	**0.98 U**	**0.97 U**	-	**1 U**	**0.99 U**	**0.99 U**	**0.96 U**	**0.98 U**	**0.98 U**	**1 U**	**1 U**	**0.97 U**
Benzo(b)fluoranthene	NA	0.98 U	0.95 U	1 U	0.98 U	0.95 U	0.95 U	-	0.98 U	-	0.98 U	0.97 U	-	1 U	0.99 U	0.99 U	0.96 U	0.98 U	0.98 U	1 U	1 U	0.97 U
Benzo(g,h,i)perylene	NA	0.98 U	0.95 U	1 U	0.98 U	0.95 U	0.95 U	-	0.98 U	-	0.98 U	0.97 U	-	1 U	0.99 U	0.99 U	0.96 U	0.98 U	0.98 U	1 U	1 U	0.97 U
Benzo(k)fluoranthene	NA	0.98 U	0.95 U	1 U	0.98 U	0.95 U	0.95 U	-	0.98 U	-	0.98 U	0.97 U	-	1 U	0.99 U	0.99 U	0.96 U	0.98 U	0.98 U	1 U	1 U	0.97 U
Benzoic acid	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzyl Alcohol	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Chloroethoxy)methane	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Chloroethyl)ether	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Ethylhexyl)phthalate	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Butyl benzylphthalate	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbazole	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	NA	0.98 U	0.95 U	1 U	0.98 U	0.95 U	0.95 U	-	0.98 U	-	0.98 U	0.97 U	-	1 U	0.99 U	0.99 U	0.96 U	0.98 U	0.98 U	1 U	1 U	0.97 U
Dibenz(a,h)anthracene	NA	0.98 U	0.95 U	1 U	0.98 U	0.95 U	0.95 U	-	0.98 U	-	0.98 U	0.97 U	-	1 U	0.99 U	0.99 U	0.96 U	0.98 U	0.98 U	1 U	1 U	0.97 U
Dibenzofuran	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Diethyl phthalate	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dimethyl phthalate	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-butylphthalate	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-octyl phthalate	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	46	0.98 U	0.95 U	1 U	0.98 U	0.95 U	0.95 U	-	0.98 U	-	0.98 U	0.97 U	-	1 U	0.99 U	0.99 U	0.96 U	0.98 U	0.98 U	1 U	1 U	0.97 U
Fluorene	46	0.98 U	0.95 U	1 U	0.98 U	0.95 U	0.95 U	-	0.98 U	-	0.98 U	0.97 U	-	1 U	0.99 U	0.99 U	0.96 U	0.98 U	0.98 U	1 U	1 U	0.97 U
Hexachlorobenzene	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobutadiene	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorocyclopentadiene	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachloroethane	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	NA	0.98 U	0.95 U	1 U	0.98 U	0.95 U	0.95 U	-	0.98 U	-	0.98 U	0.97 U	-	1 U	0.99 U	0.99 U	0.96 U	0.98 U	0.98 U	1 U	1 U	0.97 U
Isophorone	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	0.5	**0.98 U**	**0.95 U**	**1 U**	**0.98 U**	**0.95 U**	**0.95 U**	-	**0.98 U**	-	**0.98 U**	**0.97 U**	-	**1 U**	**0.99 U**	**0.99 U**	**0.96 U**	**0.98 U**	**0.98 U**	**1 U**	**1 U**	**0.97 U**
Nitrobenzene	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodimethylamine	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodi-n-propylamine	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodiphenylamine	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pentachlorophenol	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	NA	0.98 U	0.95 U	1 U	0.98 U	0.95 U	0.95 U	-	0.98 U	-	0.98 U	0.97 U	-	1 U	0.99 U	0.99 U	0.96 U	0.98 U	0.98 U	1 U	1 U	0.97 U
Phenol	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	NA	0.98 U	0.95 U	1 U	0.98 U	0.95 U	0.95 U	-	0.98 U	-	0.98 U	0.97 U	-	1 U	0.99 U	0.99 U	0.96 U	0.98 U	0.98 U	1 U	1 U	0.97 U
Pyridine	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Petroleum Hydrocarbons (ug/L)																						
Total Petroleum Hydrocarbons (C10-C28) DRO	NA	-	83 U	83 U	-	83 U	83 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Petroleum Hydrocarbons (C6-C10) GRO	NA	-	200 U	200 U	-	200 U	200 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TABLE 6-3
SUMMARY OF GROUNDWATER ANALYTICAL DATA
VERMONT YANKEE
VERNON, VERMONT

Location Name	VT ANR	101	1101	1102	1302R	1303	1303	201	201	202	202	203	204	204	3301	GZ-11S	GZ-12D	GZ-12S	GZ-13D	GZ-13D	GZ-13S	GZ-14D
Sample Name	Proposed 2019	101-20190502	1101-20190430	1102-20190501	1302R-20190501	1303-20190501	1303DUP-20190501	201-20190425	201-20190507	202-20190426	202-20190507	203-20190429	204-20190429	204-20190517	3301-20190507	GZ-11S-20190509	GZ-12D-20190513	GZ-12S-20190510	GZ-13D-20190509	GZ-13D-20190509 DUP	GZ-13S-20190508	GZ-14D-20190507
Sample Date	Groundwater	05/02/2019	04/30/2019	05/01/2019	05/01/2019	05/01/2019	05/01/2019	04/25/2019	05/07/2019	04/26/2019	05/07/2019	04/29/2019	04/29/2019	05/17/2019	05/07/2019	05/09/2019	05/13/2019	05/10/2019	05/09/2019	05/09/2019	05/08/2019	05/07/2019
Lab Sample ID	Enforcement Standard	JC87575-2	JC87448-7	JC87575-4	JC87448-11	JC87448-10	JC87448-12	JC87448-3	JC87858-8	JC87448-4	JC87858-9	JC87448-1	JC87448-2	JC88413-1	JC87858-7	JC87965-4	JC88347-1	JC87965-6	JC87965-2	JC87965-3	JC87858-3	JC87858-6
Inorganic Compounds (ug/L)																						
Phosphorus, Dissolved	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum, Total	NA	200 U	200 U	415	1260	200 U	200 U	200 U	-	200 U	-	200 U	200 U	-	200 U	200 U	5140	905	200 U	200 U	200 U	200 U
Antimony, Total	NA	6 U	6 U	6 U	6 U	6 U	6 U	6 U	-	6 U	-	6 U	6 U	-	6 U	6 U	6 U	6 U	6 U	6 U	6 U	6 U
Arsenic, Total	10	3 U	3 U	3 U	3 U	3 U	3 U	3 U	-	3 U	-	3 U	3 U	-	**22.6**	3 U	3.5	3 U	6 U	9 U	3 U	3 U
Barium, Total	2000	200 U	200 U	200 U	200 U	200 U	200 U	200 U	-	200 U	-	200 U	200 U	-	200 U	200 U	200 U	200 U	200 U	200 U	200 U	251
Beryllium, Total	4	1 U	1 U	1 U	1 U	1 U	1 U	1 U	-	1 U	-	1 U	1 U	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Cadmium, Total	5	3 U	3 U	3 U	3 U	3 U	3 U	3 U	-	3 U	-	3 U	3 U	-	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U
Calcium, Total	NA	40200	25000	23200	12500	17900	17400	21400	-	38500	-	32300	26700	-	28800	8590	97800	5000 U	174000	178000	5000 U	148000
Chromium, Total	100	10 U	10 U	10 U	10 U	10 U	10 U	10 U	-	10 U	-	10 U	10 U	-	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Cobalt, Total	NA	50 U	50 U	50 U	50 U	50 U	50 U	50 U	-	50 U	-	50 U	50 U	-	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U
Copper, Total	1300	10 U	10 U	10 U	10 U	10 U	10 U	10 U	-	10 U	-	14.6	10 U	-	10 U	10 U	13	10 U	10 U	10 U	10 U	10 U
Iron, Total	NA	100 U	100 U	729	176	100 U	100 U	100 U	-	100 U	-	100 U	100 U	-	18800	114	8090	1130	983	1020	207	14600
Lead, Total	15	3 U	3 U	3 U	3 U	3 U	3 U	3 U	-	3 U	-	3 U	3 U	-	3 U	3 U	3 U	3 U	6 U	9 U	3 U	3 U
Magnesium, Total	NA	5000 U	5390	6280	5000 U	5000 U	5000 U	5000 U	-	7100	-	5290	5000 U	-	5000 U	5000 U	16900	5000 U	18900	19500	5000 U	42800
Manganese, Total	300	15 U	15 U	22.7	179	15 U	15 U	15 U	-	**1270**	-	15 U	15 U	-	**1370**	129	**549**	40.5	**12800**	**13200**	52.2	**4690**
Mercury, Total	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	-	0.2 U	-	0.2 U	0.2 U	-	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel, Total	100	10 U	10 U	10 U	10 U	10 U	10 U	10 U	-	10 U	-	10 U	10 U	-	10 U	10 U	10.7	10 U	10 U	10 U	10 U	10 U
Potassium, Total	NA	10000 U	10000 U	10000 U	10000 U	10000 U	10000 U	10000 U	-	10000 U	-	10000 U	10000 U	-	10000 U	10000 U	10000 U	10000 U	10000 U	10000 U	10000 U	14200
Selenium, Total	50	10 U	10 U	10 U	10 U	10 U	10 U	10 U	-	10 U	-	10 U	10 U	-	10 U	10 U	10 U	10 U	20 U	30 U	10 U	10 U
Silver, Total	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	-	10 U	-	10 U	10 U	-	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Sodium, Total	NA	10000 U	15200	42500	21900	16600	16300	432000	-	73200	-	89100	190000	-	130000	10000 U	252000	72700	353000	361000	156000	262000
Thallium, Total	2	**10 U**	**10 U**	**10 U**	**10 U**	**10 U**	**10 U**	**10 U**	-	**10 U**	-	**10 U**	**10 U**	-	**10 U**	**10 U**	**10 U**	**10 U**	**20 U**	**30 U**	**10 U**	**10 U**
Vanadium, Total	NA	50 U	50 U	50 U	50 U	50 U	50 U	50 U	-	50 U	-	50 U	50 U	-	50 U	50 U	50 U	50 U	100 U	150 U	50 U	50 U
Zinc, Total	NA	20 U	20 U	20 U	20 U	20 U	20 U	20 U	-	20 U	-	20 U	20 U	-	20 U	20 U	35.7	20 U	20 U	20 U	20 U	20 U
PCBs (ug/L)																						
Aroclor-1016 (PCB-1016)	NA	-	0.33 U	0.33 U	-	0.33 U	0.33 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1221 (PCB-1221)	NA	-	0.33 U	0.33 U	-	0.33 U	0.33 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1232 (PCB-1232)	NA	-	0.33 U	0.33 U	-	0.33 U	0.33 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1242 (PCB-1242)	NA	-	0.33 U	0.33 U	-	0.33 U	0.33 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1248 (PCB-1248)	NA	-	0.33 U	0.33 U	-	0.33 U	0.33 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1254 (PCB-1254)	NA	-	0.33 U	0.33 U	-	0.33 U	0.33 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1260 (PCB-1260)	NA	-	0.33 U	0.33 U	-	0.33 U	0.33 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1262 (PCB-1262)	NA	-	0.33 U	0.33 U	-	0.33 U	0.33 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aroclor-1268 (PCB-1268)	NA	-	0.33 U	0.33 U	-	0.33 U	0.33 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SUM of PCBs		-	ND	ND	-	ND	ND	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dioxins/Furans (ug/L)																						
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	3.00E-05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Heptachlorodibenzofuran (HpCDF)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Heptachlorodibenzo-p-dioxin (HpCDD)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Hexachlorodibenzofuran (HxCDF)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Hexachlorodibenzo-p-dioxin (HxCDD), Mixture	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Pentachlorodibenzofuran (PeCDF)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Pentachlorodibenzo-p-dioxin (PeCDD)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Tetrachlorodibenzofuran (TCDF)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Tetrachlorodibenzo-p-dioxin (TCDD)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Field Parameters																						
Temperature (Deg C)	NA	9.4	10.9	11.4	11	10.2	10.2	12.2	-	9.9	-	12.4	12	-	14.4	16.9	16.7	14.7	12.9	-	11.5	15.7
Conductivity, Field (mS/cm)	NA	0.184	0.165	0.283	0.152	0.128	0.128	1.617	-	0.46	-	0.474	0.8	-	0.505	0.034	1.48	0.192	1.578	-	0.452	1.739
ORP, Field (mv)	NA	201.5	205.5	216.1	217.8	128	128	182.4	-	143.8	-	158.1	194.2	-	-94.3	97	94.5	-24.5	-5.8	-	84.8	8
Turbidity, Field (NTU)	NA	555.62	336.12	269.1	492.4	13.95	13.95	1.22	-	1.9	-	5.74	0.9	-	426.78	26.1	178.95	50.7	189.6	-	22.06	12.25
pH, Field (pH units)	NA	6.13	6.78	6.23	5.2	6.41	6.41	5.97	-	6.21	-	5.74	5.94	-	6.75	6.5	6.41	6.96	6.34	-	7.16	6.37
Dissolved Oxygen, Field (ug/L)	NA	7640	6810	8500	8830	8650	8650	3890	-	510	-	4480	8100	-	360	6350	300	420	380	-	710	760
Herbicides (ug/L)																						
2,4,5-T	70	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,5-TP (Silvex)	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dichlorophenoxyacetic acid (2,4-D)	70	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dalapon	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloroprop	140	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dinoseb	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TABLE 6-3
SUMMARY OF GROUNDWATER ANALYTICAL DATA
VERMONT YANKEE
VERNON, VERMONT

Location Name	VT ANR	101	1101	1102	1302R	1303	1303	201	201	202	202	203	204	204	3301	GZ-11S	GZ-12D	GZ-12S	GZ-13D	GZ-13D	GZ-13S	GZ-14D
Sample Name	Proposed 2019	101-20190502	1101-20190430	1102-20190501	1302R-20190501	1303-20190501	1303DUP-20190501	201-20190425	201-20190507	202-20190426	202-20190507	203-20190429	204-20190429	204-20190517	3301-20190507	GZ-11S-20190509	GZ-12D-20190513	GZ-12S-20190510	GZ-13D-20190509	GZ-13D-20190509 DUP	GZ-13S-20190508	GZ-14D-20190507
Sample Date	Groundwater	05/02/2019	04/30/2019	05/01/2019	05/01/2019	05/01/2019	05/01/2019	04/25/2019	05/07/2019	04/26/2019	05/07/2019	04/29/2019	04/29/2019	05/17/2019	05/07/2019	05/09/2019	05/13/2019	05/10/2019	05/09/2019	05/09/2019	05/08/2019	05/07/2019
Lab Sample ID	Enforcement Standard	JC87575-2	JC87448-7	JC87575-4	JC87448-11	JC87448-10	JC87448-12	JC87448-3	JC87858-8	JC87448-4	JC87858-9	JC87448-1	JC87448-2	JC88413-1	JC87858-7	JC87965-4	JC88347-1	JC87965-6	JC87965-2	JC87965-3	JC87858-3	JC87858-6
Pesticides (ug/L)																						
4,4'-DDD	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4,4'-DDE	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4,4'-DDT	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aldrin	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
alpha-BHC	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
alpha-Chlordane	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
beta-BHC	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
delta-BHC	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dieldrin	0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endosulfan I	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endosulfan II	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endosulfan sulfate	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endrin	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endrin aldehyde	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endrin ketone	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
gamma-BHC (Lindane)	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
gamma-Chlordane	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heptachlor	0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heptachlor epoxide	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methoxychlor	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toxaphene	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS (ug/L)																						
Fluorotelomer sulfonic acid (4:2 FTSA)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorotelomer sulfonic acid (6:2 FTSA)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorotelomer sulfonic acid (8:2 FTSA)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-ethyl perfluorooctane sulfonamidoacetic acid (N-EtFOSAA)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-methyl perfluorooctane sulfonamidoacetic acid (N-MeFOSAA)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorobutanesulfonic Acid (PFBS)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorobutanoic Acid (PFBA)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorodecane sulfonic Acid (PFDS)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorodecanoic acid (PFDA)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorododecanoic acid (PFDoDA)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluoroheptane sulfonic acid (PFHpS)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluoroheptanoic acid (PFHpA)	0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorohexanesulfonic acid (PFHxS)	0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorohexanoic acid (PFHxA)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorononane sulfonic acid (PFNS)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorononanoic Acid (PFNA)	0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorooctane sulfonamide (FOSA)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorooctanesulfonic acid (PFOS)	0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorooctanoic Acid (PFOA)	0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluoropentane sulfonic acid (PFPeS)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluoropentanoic Acid (PFPeA)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorotetradecanoic acid (PFTeDA)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorotridecanoic acid (PFTrDA)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluoroundecanoic acid (PFUnA)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SUM of PFAS (ND = 0)	0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SUM of PFAS (ND = 1/2 RL)	0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

ABBREVIATIONS AND NOTES:
-: Not Analyzed
J: valued is estimated
J+: valued is estimated with a potential high bias
mS/cm: milliSiemen per centimeter
mv: millivolt
NA: Not Applicable
NTU: Nephelometric Turbidiy Units
RSL: Risk-Based Screening Levels
U: Not detected, value is the laboratory reporting limit
ug/L: microgram per liter
USEPA: United States Environmental Protection Agency
VT ANR: Vermont Agency of Natural Resources

- Volatile and Semi-Volatile analytes detected in at least one sample are reported herein.
  For a complete list of analytes see the laboratory data sheets.
- Bold values indicate an exceedance of the VT ANR Proposed 2019 Groundwater
  Enforcement Standard.

TABLE 6-3
SUMMARY OF GROUNDWATER ANALYTICAL DATA
VERMONT YANKEE
VERNON, VERMONT

Location Name	VT ANR	GZ-14S	GZ-15S	GZ-17S	GZ-19D	GZ-19S	GZ-1S	GZ-21S	GZ-22D	GZ-25S	GZ-27S	GZ-2S	GZ-5S	GZ-6S	GZ-8S	GZ-9S	3401	DP0501	DP0502	DP0503	DP0504
Sample Name	Proposed 2019	GZ-14S-20190507	GZ-15S-20190508	GZ-17S-20190515	GZ-19D-20190514	GZ-19S-20190514	GZ-1S-20190502	GZ-21S-20190509	GZ-22D-20190513	GZ-25S-20190430	GZ-27S-20190430	GZ-2S-20190508	GZ-5S-20190514	GZ-6S-20190515	GZ-8S-20190515	GZ-9S-20190507	3401-20190502	GW0501-20190503	GW0502-20190503	GW0503-20190503	GW0504-20190503
Sample Date	Groundwater	05/07/2019	05/08/2019	05/15/2019	05/14/2019	05/14/2019	05/02/2019	05/09/2019	05/13/2019	04/30/2019	04/30/2019	05/08/2019	05/14/2019	05/15/2019	05/15/2019	05/07/2019	05/02/2019	05/03/2019	05/03/2019	05/03/2019	05/03/2019
Lab Sample ID	Enforcement Standard	JC87858-5	JC87858-4	JC88302-3	JC88347-4	JC88347-6	JC87575-1	JC87965-1	JC88347-2	JC87448-5	JC87448-6	JC87858-2	JC88347-5	JC88302-2	JC88302-1	JC87858-1	JC87575-3	JC87576-7	JC87576-4	JC87576-5	JC87576-3
Volatile Organic Compounds (ug/L)																					
1,1,1,2-Tetrachloroethane	70	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,1-Trichloroethane	200	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	70	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1.1	1 U	1 U
1,1-Dichloroethene	7	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloropropene	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2,3-Trichlorobenzene	0.9	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**
1,2,3-Trichloropropane	0.02	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**
1,2,4-Trichlorobenzene	70	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2,4-Trimethylbenzene	23	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	1.5 J	**48.5**	2 U	2 U
1,2-Dibromo-3-chloropropane (DBCP)	0.2	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**
1,2-Dibromoethane (Ethylene Dibromide)	0.05	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**
1,2-Dichlorobenzene	600	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloropropane	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,3,5-Trimethylbenzene	23	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	15.8	2 U	2 U
1,3-Dichlorobenzene	600	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,3-Dichloropropane	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	75	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2,2-Dichloropropane	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2-Butanone (Methyl Ethyl Ketone)	511	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Chlorotoluene	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
2-Phenylbutane (sec-Butylbenzene)	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2.9	2 U	2 U
4-Chlorotoluene	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	NA	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Acetone	950	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzene	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Bromobenzene	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromodichloromethane	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromoform	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromomethane (Methyl Bromide)	5	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 UJ	2 UJ	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Carbon tetrachloride	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	100	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobromomethane	8	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroethane	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroform (Trichloromethane)	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloromethane (Methyl Chloride)	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
cis-1,2-Dichloroethene	70	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1.8
cis-1,3-Dichloropropene	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Cymene (p-Isopropyltoluene)	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2.9	2 U	2 U
Dibromochloromethane	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Dibromomethane	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Dichlorodifluoromethane (CFC-12)	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	14	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Ethylbenzene	700	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1.9	1 U	1 U
Hexachlorobutadiene	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Isopropylbenzene (Cumene)	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2.3	1 U	1 U
m,p-Xylenes	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1.7	1 U	1 U
Methyl Tert Butyl Ether	11	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Methylene chloride	5	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Naphthalene	0.5	**5 U**	**5 U**	**5 U**	**5 U**	**5 U**	**5 U**	**5 U**	**5 U**	**5 U**	**5 U**	**5 U**	**5 U**	**5 U**	**5 U**	**5 U**	**5 U**	**4.1 J**	**59.1**	**5 U**	**5 U**
n-Butylbenzene	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2.1	2 U	2 U
n-Propylbenzene	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	5.4	2 U	2 U
o-Xylene	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Styrene	100	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
tert-Butylbenzene	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Tetrachloroethene	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	1000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,2-Dichloroethene	100	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,3-Dichloropropene	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2.4
Trichlorofluoromethane (CFC-11)	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Vinyl chloride	2	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Xylene (total)	10000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1.7	1 U	1 U

TABLE 6-3
SUMMARY OF GROUNDWATER ANALYTICAL DATA
VERMONT YANKEE
VERNON, VERMONT

Location Name	VT ANR	GZ-14S	GZ-15S	GZ-17S	GZ-19D	GZ-19S	GZ-1S	GZ-21S	GZ-22D	GZ-25S	GZ-27S	GZ-2S	GZ-5S	GZ-6S	GZ-8S	GZ-9S	3401	DP0501	DP0502	DP0503	DP0504
Sample Name	Proposed 2019	GZ-14S-20190507	GZ-15S-20190508	GZ-17S-20190515	GZ-19D-20190514	GZ-19S-20190514	GZ-1S-20190502	GZ-21S-20190509	GZ-22D-20190513	GZ-25S-20190430	GZ-27S-20190430	GZ-2S-20190508	GZ-5S-20190514	GZ-6S-20190515	GZ-8S-20190515	GZ-9S-20190507	3401-20190502	GW0501-20190503	GW0502-20190503	GW0503-20190503	GW0504-20190503
Sample Date	Groundwater	05/07/2019	05/08/2019	05/15/2019	05/14/2019	05/14/2019	05/02/2019	05/09/2019	05/13/2019	04/30/2019	04/30/2019	05/08/2019	05/14/2019	05/15/2019	05/15/2019	05/07/2019	05/02/2019	05/03/2019	05/03/2019	05/03/2019	05/03/2019
Lab Sample ID	Enforcement Standard	JC87858-5	JC87858-4	JC88302-3	JC88347-4	JC88347-6	JC87575-1	JC87965-1	JC88347-2	JC87448-5	JC87448-6	JC87858-2	JC88347-5	JC88302-2	JC88302-1	JC87858-1	JC87575-3	JC87576-7	JC87576-4	JC87576-5	JC87576-3
Semi-Volatile Organic Compounds (ug/L)																					
1,2,4-Trichlorobenzene	70	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	600	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Diphenylhydrazine	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	600	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	75	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1-Methylnaphthalene	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,2'-oxybis(1-Chloropropane)	46	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,5-Trichlorophenol	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dichlorophenol	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrophenol	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dinitrotoluene	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,6-Dinitrotoluene	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Chloronaphthalene	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Chlorophenol	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylnaphthalene	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Methylphenol (o-Cresol)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Nitroaniline	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2-Nitrophenol	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3&4-Methylphenol	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3,3'-Dichlorobenzidine	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3-Nitroaniline	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4,6-Dinitro-2-methylphenol	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Bromophenyl phenyl ether	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chloro-3-methylphenol	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chloroaniline	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Chlorophenyl phenyl ether	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Nitroaniline	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4-Nitrophenol	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Acenaphthene	NA	1 U	0.98 U	0.95 U	0.95 U	0.95 U	0.99 U	0.99 U	1 U	0.95 U	0.98 U	1 U	0.95 U	1 U	1 U	0.95 U	0.98 U	0.32 J	0.45 J	0.98 U	0.98 U
Acenaphthylene	NA	1 U	0.98 U	0.95 U	0.95 U	0.95 U	0.99 U	0.99 U	1 U	0.95 U	0.98 U	1 U	0.95 U	1 U	1 U	0.95 U	0.98 U	0.98 U	1.1 U	0.98 U	0.98 U
Aniline	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Anthracene	343	1 U	0.98 U	0.95 U	0.95 U	0.95 U	0.99 U	0.99 U	1 U	0.95 U	0.98 U	1 U	0.95 U	1 U	1 U	0.95 U	0.98 U	0.98 U	1.1 U	0.98 U	0.98 U
Benzidine	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzo(a)anthracene	NA	1 U	0.98 U	0.95 U	0.95 U	0.95 U	0.99 U	0.99 U	1 U	0.95 U	0.98 U	1 U	0.95 U	1 U	1 U	0.95 U	0.98 U	0.98 U	1.1 U	0.98 U	0.98 U
Benzo(a)pyrene	0.2	**1 U**	**0.98 U**	**0.95 U**	**0.95 U**	**0.95 U**	**0.99 U**	**0.99 U**	**1 U**	**0.95 U**	**0.98 U**	**1 U**	**0.95 U**	**1 U**	**1 U**	**0.95 U**	**0.98 U**	**0.98 U**	**1.1 U**	**0.98 U**	**0.98 U**
Benzo(b)fluoranthene	NA	1 U	0.98 U	0.95 U	0.95 U	0.95 U	0.99 U	0.99 U	1 U	0.95 U	0.98 U	1 U	0.95 U	1 U	1 U	0.95 U	0.98 U	0.98 U	1.1 U	0.98 U	0.98 U
Benzo(g,h,i)perylene	NA	1 U	0.98 U	0.95 U	0.95 U	0.95 U	0.99 U	0.99 U	1 U	0.95 U	0.98 U	1 U	0.95 U	1 U	1 U	0.95 U	0.98 U	0.98 U	1.1 U	0.98 U	0.98 U
Benzo(k)fluoranthene	NA	1 U	0.98 U	0.95 U	0.95 U	0.95 U	0.99 U	0.99 U	1 U	0.95 U	0.98 U	1 U	0.95 U	1 U	1 U	0.95 U	0.98 U	0.98 U	1.1 U	0.98 U	0.98 U
Benzoic acid	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Benzyl Alcohol	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Chloroethoxy)methane	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Chloroethyl)ether	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
bis(2-Ethylhexyl)phthalate	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Butyl benzylphthalate	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Carbazole	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chrysene	NA	1 U	0.98 U	0.95 U	0.95 U	0.95 U	0.99 U	0.99 U	1 U	0.95 U	0.98 U	1 U	0.95 U	1 U	1 U	0.95 U	0.98 U	0.98 U	1.1 U	0.98 U	0.98 U
Dibenz(a,h)anthracene	NA	1 U	0.98 U	0.95 U	0.95 U	0.95 U	0.99 U	0.99 U	1 U	0.95 U	0.98 U	1 U	0.95 U	1 U	1 U	0.95 U	0.98 U	0.98 U	1.1 U	0.98 U	0.98 U
Dibenzofuran	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Diethyl phthalate	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dimethyl phthalate	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-butylphthalate	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Di-n-octyl phthalate	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluoranthene	46	1 U	0.98 U	0.95 U	0.95 U	0.95 U	0.99 U	0.99 U	1 U	0.95 U	0.98 U	1 U	0.95 U	1 U	1 U	0.95 U	0.98 U	0.98 U	1.1 U	0.98 U	0.98 U
Fluorene	46	1 U	0.98 U	0.95 U	0.95 U	0.95 U	0.99 U	0.99 U	1 U	0.95 U	0.98 U	1 U	0.95 U	1 U	1 U	0.95 U	0.98 U	0.37 J	0.52 J	0.98 U	0.98 U
Hexachlorobenzene	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorobutadiene	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorocyclopentadiene	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachloroethane	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Indeno(1,2,3-cd)pyrene	NA	1 U	0.98 U	0.95 U	0.95 U	0.95 U	0.99 U	0.99 U	1 U	0.95 U	0.98 U	1 U	0.95 U	1 U	1 U	0.95 U	0.98 U	0.98 U	1.1 U	0.98 U	0.98 U
Isophorone	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Naphthalene	0.5	**1 U**	**0.98 U**	**0.95 U**	**0.95 U**	0.49 J	**0.99 U**	**0.99 U**	**1 U**	**0.95 U**	**0.98 U**	**1 U**	**0.95 U**	**1 U**	**1 U**	**0.95 U**	**0.98 U**	**0.89 J**	**3.4**	**0.98 U**	**0.98 U**
Nitrobenzene	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodimethylamine	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodi-n-propylamine	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N-Nitrosodiphenylamine	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pentachlorophenol	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	NA	1 U	0.98 U	0.95 U	0.95 U	0.95 U	0.99 U	0.99 U	1 U	0.95 U	0.98 U	1 U	0.95 U	1 U	1 U	0.95 U	0.98 U	1	1 J	0.98 U	0.98 U
Phenol	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pyrene	NA	1 U	0.98 U	0.95 U	0.95 U	0.95 U	0.99 U	0.99 U	1 U	0.95 U	0.98 U	1 U	0.95 U	1 U	1 U	0.95 U	0.98 U	0.98 U	1.1 U	0.98 U	0.98 U
Pyridine	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Petroleum Hydrocarbons (ug/L)																					
Total Petroleum Hydrocarbons (C10-C28) DRO	NA	-	-	83 U	83 U	83 U	-	83 U	-	-	83 U	-	-	-	83 U	-	-	134	1350	83 U	83 U
Total Petroleum Hydrocarbons (C6-C10) GRO	NA	-	-	200 U	200 U	200 U	-	200 U	-	-	200 U	-	-	-	200 U	-	-	200 U	481	200 U	200 U

TABLE 6-3
SUMMARY OF GROUNDWATER ANALYTICAL DATA
VERMONT YANKEE
VERNON, VERMONT

Location Name	VT ANR	GZ-14S	GZ-15S	GZ-17S	GZ-19D	GZ-19S	GZ-1S	GZ-21S	GZ-22D	GZ-25S	GZ-27S	GZ-2S	GZ-5S	GZ-6S	GZ-8S	GZ-9S	3401	DP0501	DP0502	DP0503	DP0504
Sample Name	Proposed 2019	GZ-14S-20190507	GZ-15S-20190508	GZ-17S-20190515	GZ-19D-20190514	GZ-19S-20190514	GZ-1S-20190502	GZ-21S-20190509	GZ-22D-20190513	GZ-25S-20190430	GZ-27S-20190430	GZ-2S-20190508	GZ-5S-20190514	GZ-6S-20190515	GZ-8S-20190515	GZ-9S-20190507	3401-20190502	GW0501-20190503	GW0502-20190503	GW0503-20190503	GW0504-20190503
Sample Date	Groundwater	05/07/2019	05/08/2019	05/15/2019	05/14/2019	05/14/2019	05/02/2019	05/09/2019	05/13/2019	04/30/2019	04/30/2019	05/08/2019	05/14/2019	05/15/2019	05/15/2019	05/07/2019	05/02/2019	05/03/2019	05/03/2019	05/03/2019	05/03/2019
Lab Sample ID	Enforcement Standard	JC87858-5	JC87858-4	JC88302-3	JC88347-4	JC88347-6	JC87575-1	JC87965-1	JC88347-2	JC87448-5	JC87448-6	JC87858-2	JC88347-5	JC88302-2	JC88302-1	JC87858-1	JC87575-3	JC87576-7	JC87576-4	JC87576-5	JC87576-3
Inorganic Compounds (ug/L)																					
Phosphorus, Dissolved	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum, Total	NA	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	443	200 U	563	200 U	200 U	1940	200 U	200 U	27000	46400	11700	30000
Antimony, Total	NA	6 U	6 U	6 U	6 U	6 U	6 U	6 U	6 U	6 U	6 U	6 U	6 U	6 U	6 U	6 U	6 U	30 U	30 U	6 U	30 U
Arsenic, Total	10	**14.6**	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	**12.1**	3 U	3 U	3 U	3 U	**15 U**	**21.5**	3.1	**15 U**
Barium, Total	2000	200 U	200 U	200 U	200 U	200 U	248	200 U	200 U	200 U	200 U	807	200 U	200 U	200 U	200 U	200 U	1000 U	1000 U	200 U	1000 U
Beryllium, Total	4	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	**5 U**	**5 U**	1 U	**5 U**
Cadmium, Total	5	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	**15 U**	**15 U**	3 U	**15 U**
Calcium, Total	NA	30300	135000	109000	99400	62200	76200	46900	126000	21900	11600	377000	59700	68000	8440	62700	11100	27100	127000	65200	71200
Chromium, Total	100	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	**102**	**127**	45.3	76
Cobalt, Total	NA	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	250 U	250 U	50 U	250 U
Copper, Total	1300	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10.7	10 U	10 U	10 U	10 U	10 U	50.5	71	28.8	50 U
Iron, Total	NA	9500	683	100 U	189	100 U	100 U	100 U	136	100 U	100 U	28500	35900	100 U	1090	288	100 U	42600	84700	20800	47500
Lead, Total	15	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	15 U	3 U	3 U	3 U	3 U	3 U	15 U	**26.5**	4.9	15 U
Magnesium, Total	NA	5000 U	27400	12200	26700	8840	8140	5500	22700	5450	5000 U	31700	8350	5080	5000 U	7140	5000 U	25000 U	37800	11800	25000 U
Manganese, Total	300	**4120**	**356**	15 U	**954**	39.2	15 U	31.9	**2520**	**774**	15 U	**32500**	**5690**	109	32.9	240	15 U	**807**	**13900**	**585**	**3780**
Mercury, Total	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel, Total	100	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	16.5	10 U	10 U	10 U	10 U	10 U	10 U	10 U	70	**106**	38.6	55.5
Potassium, Total	NA	10000 U	10000 U	10000 U	10000 U	10000 U	10000 U	10000 U	10000 U	11800	10000 U	23400	10000 U	10000 U	10000 U	10000 U	10000 U	50000 U	50000 U	10000 U	50000 U
Selenium, Total	50	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	50 U	10 U	10 U	10 U	10 U	10 U	50 U	50 U	10 U	50 U
Silver, Total	NA	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	50 U	50 U	10 U	50 U
Sodium, Total	NA	286000	651000	607000	86800	108000	670000	273000	330000	54300	13900	1700000	115000	451000	57800	702000	98200	439000	319000	534000	50000 U
Thallium, Total	2	**10 U**	**10 U**	**10 U**	**10 U**	**10 U**	**10 U**	**10 U**	**10 U**	**10 U**	**10 U**	**50 U**	**10 U**	**10 U**	**10 U**	**10 U**	**10 U**	**50 U**	**50 U**	**10 U**	**50 U**
Vanadium, Total	NA	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	50 U	250 U	50 U	50 U	50 U	50 U	50 U	250 U	250 U	50 U	250 U
Zinc, Total	NA	20 U	20 U	20 U	20 U	20 U	20 U	2270	20 U	40.5	20 U	20 U	20 U	20 U	20 U	28.5	20 U	374	251	181	211
PCBs (ug/L)																					
Aroclor-1016 (PCB-1016)	NA	-	-	-	-	-	-	-	-	-	0.33 U	-	-	-	-	-	-	-	-	-	-
Aroclor-1221 (PCB-1221)	NA	-	-	-	-	-	-	-	-	-	0.33 U	-	-	-	-	-	-	-	-	-	-
Aroclor-1232 (PCB-1232)	NA	-	-	-	-	-	-	-	-	-	0.33 U	-	-	-	-	-	-	-	-	-	-
Aroclor-1242 (PCB-1242)	NA	-	-	-	-	-	-	-	-	-	0.33 U	-	-	-	-	-	-	-	-	-	-
Aroclor-1248 (PCB-1248)	NA	-	-	-	-	-	-	-	-	-	0.33 U	-	-	-	-	-	-	-	-	-	-
Aroclor-1254 (PCB-1254)	NA	-	-	-	-	-	-	-	-	-	0.33 U	-	-	-	-	-	-	-	-	-	-
Aroclor-1260 (PCB-1260)	NA	-	-	-	-	-	-	-	-	-	0.33 U	-	-	-	-	-	-	-	-	-	-
Aroclor-1262 (PCB-1262)	NA	-	-	-	-	-	-	-	-	-	0.33 U	-	-	-	-	-	-	-	-	-	-
Aroclor-1268 (PCB-1268)	NA	-	-	-	-	-	-	-	-	-	0.33 U	-	-	-	-	-	-	-	-	-	-
SUM of PCBs		-	-	-	-	-	-	-	-	-	ND	-	-	-	-	-	-	-	-	-	-
Dioxins/Furans (ug/L)																					
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	3.00E-05	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Heptachlorodibenzofuran (HpCDF)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Heptachlorodibenzo-p-dioxin (HpCDD)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Hexachlorodibenzofuran (HxCDF)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Hexachlorodibenzo-p-dioxin (HxCDD), Mixture	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Pentachlorodibenzofuran (PeCDF)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Pentachlorodibenzo-p-dioxin (PeCDD)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Tetrachlorodibenzofuran (TCDF)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Tetrachlorodibenzo-p-dioxin (TCDD)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Field Parameters																					
Temperature (Deg C)	NA	14.8	16.3	18.8	13.4	13.3	12	14.2	13.2	11.7	11.6	13.8	14.5	14.8	13	14.8	11.7	-	-	-	-
Conductivity, Field (mS/cm)	NA	1.257	2.935	2.227	0.581	0.475	2.27	0.6	1.27	0.346	0.102	6.467	0.587	1.437	1.79	2.51	0.41	-	-	-	-
ORP, Field (mv)	NA	-41.2	97.5	152.4	91.1	134.8	155.1	116	151.9	261.5	139	-3.5	-55.7	144	135.1	103.7	247	-	-	-	-
Turbidity, Field (NTU)	NA	2.11	360.7	453.13	325.25	122.61	3.14	1.68	4.42	86.94	43.1	50.22	1.84	28.95	731.2	291.34	23.3	-	-	-	-
pH, Field (pH units)	NA	6.71	6.26	6.06	6.74	5.97	5.93	5.83	6.39	4.42	6.07	6.3	6.49	6.99	6.78	6.62	6.08	-	-	-	-
Dissolved Oxygen, Field (ug/L)	NA	300	340	2710	340	640	7770	4000	350	1050	8570	310	290	1020	3950	890	9100	-	-	-	-
Herbicides (ug/L)																					
2,4,5-T	70	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4,5-TP (Silvex)	50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2,4-Dichlorophenoxyacetic acid (2,4-D)	70	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dalapon	200	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dichloroprop	140	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dinoseb	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TABLE 6-3
SUMMARY OF GROUNDWATER ANALYTICAL DATA
VERMONT YANKEE
VERNON, VERMONT

Location Name	VT ANR	GZ-14S	GZ-15S	GZ-17S	GZ-19D	GZ-19S	GZ-1S	GZ-21S	GZ-22D	GZ-25S	GZ-27S	GZ-2S	GZ-5S	GZ-6S	GZ-8S	GZ-9S	3401	DP0501	DP0502	DP0503	DP0504
Sample Name	Proposed 2019	GZ-14S-20190507	GZ-15S-20190508	GZ-17S-20190515	GZ-19D-20190514	GZ-19S-20190514	GZ-1S-20190502	GZ-21S-20190509	GZ-22D-20190513	GZ-25S-20190430	GZ-27S-20190430	GZ-2S-20190508	GZ-5S-20190514	GZ-6S-20190515	GZ-8S-20190515	GZ-9S-20190507	3401-20190502	GW0501-20190503	GW0502-20190503	GW0503-20190503	GW0504-20190503
Sample Date	Groundwater Enforcement Standard	05/07/2019	05/08/2019	05/15/2019	05/14/2019	05/14/2019	05/02/2019	05/09/2019	05/13/2019	04/30/2019	04/30/2019	05/08/2019	05/14/2019	05/15/2019	05/15/2019	05/07/2019	05/02/2019	05/03/2019	05/03/2019	05/03/2019	05/03/2019
Lab Sample ID		JC87858-5	JC87858-4	JC88302-3	JC88347-4	JC88347-6	JC87575-1	JC87965-1	JC88347-2	JC87448-5	JC87448-6	JC87858-2	JC88347-5	JC88302-2	JC88302-1	JC87858-1	JC87575-3	JC87576-7	JC87576-4	JC87576-5	JC87576-3
Pesticides (ug/L)																					
4,4'-DDD	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4,4'-DDE	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4,4'-DDT	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aldrin	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
alpha-BHC	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
alpha-Chlordane	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
beta-BHC	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
delta-BHC	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dieldrin	0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endosulfan I	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endosulfan II	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endosulfan sulfate	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endrin	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endrin aldehyde	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Endrin ketone	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
gamma-BHC (Lindane)	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
gamma-Chlordane	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heptachlor	0.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Heptachlor epoxide	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Methoxychlor	40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Toxaphene	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PFAS (ug/L)																					
Fluorotelomer sulfonic acid (4:2 FTSA)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.008 U	-	0.008 U
Fluorotelomer sulfonic acid (6:2 FTSA)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.008 U	-	0.008 U
Fluorotelomer sulfonic acid (8:2 FTSA)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.008 U	-	0.008 U
N-ethyl perfluorooctane sulfonamidoacetic acid (N-EtFOSAA)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.02 U	-	0.02 U
N-methyl perfluorooctane sulfonamidoacetic acid (N-MeFOSAA)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.02 U	-	0.02 U
Perfluorobutanesulfonic Acid (PFBS)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0134	-	0.0303
Perfluorobutanoic Acid (PFBA)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00946	-	0.0333
Perfluorodecane sulfonic Acid (PFDS)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.004 U	-	0.004 U
Perfluorodecanoic acid (PFDA)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.004 U	-	0.004 U
Perfluorododecanoic acid (PFDoDA)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.004 U	-	0.004 U
Perfluoroheptane sulfonic acid (PFHpS)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.004 U	-	0.004 U
Perfluoroheptanoic acid (PFHpA)	0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0137	-	**0.121**
Perfluorohexanesulfonic acid (PFHxS)	0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00116 J	-	0.00139 J
Perfluorohexanoic acid (PFHxA)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0107	-	0.0697
Perfluorononane sulfonic acid (PFNS)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.004 U	-	0.004 U
Perfluorononanoic Acid (PFNA)	0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.004 U	-	0.004 U
Perfluorooctane sulfonamide (FOSA)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.004 U	-	0.004 U
Perfluorooctanesulfonic acid (PFOS)	0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00223 J	-	0.004 U
Perfluorooctanoic Acid (PFOA)	0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.00817	-	0.004 U
Perfluoropentane sulfonic acid (PFPeS)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.004 U	-	0.004 U
Perfluoropentanoic Acid (PFPeA)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0122	-	0.0515
Perfluorotetradecanoic acid (PFTeDA)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.004 U	-	0.004 U
Perfluorotridecanoic acid (PFTrDA)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.004 U	-	0.004 U
Perfluoroundecanoic acid (PFUnA)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.004 U	-	0.004 U
SUM of PFAS (ND = 0)	0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.02526**	-	**0.12239**
SUM of PFAS (ND = 1/2 RL)	0.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	**0.02726**	-	**0.12839**

ABBREVIATIONS AND NOTES:
-: Not Analyzed
J: valued is estimated
J+: valued is estimated with a potential high bias
mS/cm: milliSiemen per centimeter
mv: millivolt
NA: Not Applicable
NTU: Nephelometric Turbidiy Units
RSL: Risk-Based Screening Levels
U: Not detected, value is the laboratory reporting limit
ug/L: microgram per liter
USEPA: United States Environmental Protection Agency
VT ANR: Vermont Agency of Natural Resources

- Volatile and Semi-Volatile analytes detected in at least one sample are reported herein. For a complete list of analytes see the laboratory data sheets.
- Bold values indicate an exceedance of the VT ANR Proposed 2019 Groundwater Enforcement Standard.

TABLE 6-3
SUMMARY OF GROUNDWATER ANALYTICAL DATA
VERMONT YANKEE
VERNON, VERMONT

Location Name	VT ANR	DP0601	DP0602	DP0807	DP0808	DP1001	DP1002	DP1003	DP1201	DP1202	DP1209	DP1306	DP1307	DP1308	DP1309	DP1309	DP1310	DP1311
Sample Name	Proposed 2019	GW0601-20190515	GW0602-20190515	GW0807-20190503	GW0808-20190503	GW1001-20190429	GW1002-20190429	GW1003-20190429	GW1201-20190509	GW1202-20190509	GW1209-20190426	GW1306-20190508	GW1307-20190508	GW1308-20190508	GW1309-20190429	GW1309DUP-20190429	GW1310-20190429	GW1311-20190429
Sample Date	Groundwater	05/15/2019	05/15/2019	05/03/2019	05/03/2019	04/29/2019	04/29/2019	04/29/2019	05/09/2019	05/09/2019	04/26/2019	05/08/2019	05/08/2019	05/08/2019	04/29/2019	04/29/2019	04/29/2019	04/29/2019
	Enforcement			B3259_16698_DF_002	B3259_16671_DF_001													
Lab Sample ID	Standard	JC88303-2	JC88303-1	JC87576-2	JC87576-1	JC87443-4	JC87443-3	JC87443-1	JC87972-2	JC87972-3	JC87127-6	JC87972-5	JC87972-6	JC87972-1	JC87443-6	JC87443-7	JC87443-2	JC87443-5
Volatile Organic Compounds (ug/L)																		
1,1,1,2-Tetrachloroethane	70	1 U	1 U	-	-	-	-	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,1-Trichloroethane	200	1 U	1 U	-	-	-	-	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	NA	1 U	1 U	-	-	-	-	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	5	1 U	1 U	-	-	-	-	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	70	1 U	1 U	-	-	-	-	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	7	1 U	1 U	-	-	-	-	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloropropene	NA	1 U	1 U	-	-	-	-	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2,3-Trichlorobenzene	0.9	**1 U**	**1 U**	-	-	-	-	-	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**
1,2,3-Trichloropropane	0.02	**2 U**	**2 U**	-	-	-	-	-	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**
1,2,4-Trichlorobenzene	70	1 U	1 U	-	-	-	-	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2,4-Trimethylbenzene	23	2 U	2 U	-	-	-	-	-	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,2-Dibromo-3-chloropropane (DBCP)	0.2	**2 U**	**2 U**	-	-	-	-	-	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**
1,2-Dibromoethane (Ethylene Dibromide)	0.05	**1 U**	**1 U**	-	-	-	-	-	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**
1,2-Dichlorobenzene	600	1 U	1 U	-	-	-	-	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	5	1 U	1 U	-	-	-	-	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloropropane	5	1 U	1 U	-	-	-	-	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,3,5-Trimethylbenzene	23	2 U	2 U	-	-	-	-	-	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,3-Dichlorobenzene	600	1 U	1 U	-	-	-	-	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,3-Dichloropropane	NA	1 U	1 U	-	-	-	-	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	75	1 U	1 U	-	-	-	-	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2,2-Dichloropropane	NA	1 U	1 U	-	-	-	-	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2-Butanone (Methyl Ethyl Ketone)	511	10 U	9 J	-	-	-	-	-	10 U	10 U	10 U	10 U	7.8 J	10 U	10 U	10 U	10 U	10 U
2-Chlorotoluene	NA	2 U	2 U	-	-	-	-	-	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
2-Phenylbutane (sec-Butylbenzene)	NA	2 U	2 U	-	-	-	-	-	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
4-Chlorotoluene	NA	2 U	2 U	-	-	-	-	-	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	NA	5 U	5 U	-	-	-	-	-	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Acetone	950	17.4 U	50.1 U	-	-	-	-	-	10 U	10 U	10 U	23 U	36.1 J+	26.6 U	10 U	10 U	10 U	10 U
Benzene	5	0.5 U	0.5 U	-	-	-	-	-	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Bromobenzene	NA	1 U	1 U	-	-	-	-	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromodichloromethane	NA	1 U	1 U	-	-	-	-	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromoform	NA	1 U	1 U	-	-	-	-	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromomethane (Methyl Bromide)	5	2 U	2 U	-	-	-	-	-	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Carbon tetrachloride	5	1 U	1 U	-	-	-	-	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	100	1 U	1 U	-	-	-	-	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobromomethane	8	1 U	1 U	-	-	-	-	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroethane	NA	1 U	1 U	-	-	-	-	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroform (Trichloromethane)	NA	1 U	1 U	-	-	-	-	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloromethane (Methyl Chloride)	NA	1 U	1 U	-	-	-	-	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
cis-1,2-Dichloroethene	70	1 U	1 U	-	-	-	-	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
cis-1,3-Dichloropropene	NA	1 U	1 U	-	-	-	-	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Cymene (p-Isopropyltoluene)	NA	2 U	2 U	-	-	-	-	-	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Dibromochloromethane	NA	1 U	1 U	-	-	-	-	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Dibromomethane	NA	1 U	1 U	-	-	-	-	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Dichlorodifluoromethane (CFC-12)	NA	2 U	2 U	-	-	-	-	-	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Ethylbenzene	700	1 U	1 U	-	-	-	-	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Hexachlorobutadiene	NA	2 U	2 U	-	-	-	-	-	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Isopropylbenzene (Cumene)	NA	1 U	1 U	-	-	-	-	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
m,p-Xylenes	NA	1 U	1 U	-	-	-	-	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Methyl Tert Butyl Ether	11	1 U	1 U	-	-	-	-	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Methylene chloride	5	2 U	2 U	-	-	-	-	-	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Naphthalene	0.5	**5 U**	**5 U**	-	-	-	-	-	**5 U**	**5 U**	**5 U**	**5 U**	**5 U**	**5 U**	**5 U**	**5 U**	**5 U**	**5 U**
n-Butylbenzene	NA	2 U	2 U	-	-	-	-	-	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
n-Propylbenzene	NA	2 U	2 U	-	-	-	-	-	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
o-Xylene	NA	1 U	1 U	-	-	-	-	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Styrene	100	1 U	1 U	-	-	-	-	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
tert-Butylbenzene	NA	2 U	2 U	-	-	-	-	-	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Tetrachloroethene	5	1 U	1 U	-	-	-	-	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	1000	1 U	1 U	-	-	-	-	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,2-Dichloroethene	100	1 U	1 U	-	-	-	-	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,3-Dichloropropene	NA	1 U	1 U	-	-	-	-	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene	5	1 U	1 U	-	-	-	-	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichlorofluoromethane (CFC-11)	NA	2 U	2 U	-	-	-	-	-	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Vinyl chloride	2	1 U	1 U	-	-	-	-	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Xylene (total)	10000	1 U	1 U	-	-	-	-	-	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U

TABLE 6-3
SUMMARY OF GROUNDWATER ANALYTICAL DATA
VERMONT YANKEE
VERNON, VERMONT

Location Name	VT ANR	DP0601	DP0602	DP0807	DP0808	DP1001	DP1002	DP1003	DP1201	DP1202	DP1209	DP1306	DP1307	DP1308	DP1309	DP1309	DP1310	DP1311
Sample Name	Proposed 2019	GW0601-20190515	GW0602-20190515	GW0807-20190503	GW0808-20190503	GW1001-20190429	GW1002-20190429	GW1003-20190429	GW1201-20190509	GW1202-20190509	GW1209-20190426	GW1306-20190508	GW1307-20190508	GW1308-20190508	GW1309-20190429	GW1309DUP-20190429	GW1310-20190429	GW1311-20190429
Sample Date	Groundwater	05/15/2019	05/15/2019	05/03/2019	05/03/2019	04/29/2019	04/29/2019	04/29/2019	05/09/2019	05/09/2019	04/26/2019	05/08/2019	05/08/2019	05/08/2019	04/29/2019	04/29/2019	04/29/2019	04/29/2019
	Enforcement			B3259_16698_DF_002	B3259_16671_DF_001													
Lab Sample ID	Standard	JC88303-2	JC88303-1	JC87576-2	JC87576-1	JC87443-4	JC87443-3	JC87443-1	JC87972-2	JC87972-3	JC87127-6	JC87972-5	JC87972-6	JC87972-1	JC87443-6	JC87443-7	JC87443-2	JC87443-5
Semi-Volatile Organic Compounds (ug/L)																		
1,2,4-Trichlorobenzene	70	0.95 U	0.95 U	-	-	-	-	-	0.96 U	1 U	0.95 U	2 U	1.2 U	2 U	0.93 U	0.97 U	1.1 U	1 U
1,2-Dichlorobenzene	600	0.95 U	0.95 U	-	-	-	-	-	0.96 U	1 U	0.95 U	2 U	1.2 U	2 U	0.93 U	0.97 U	1.1 U	1 U
1,2-Diphenylhydrazine	NA	0.95 U	0.95 U	-	-	-	-	-	0.96 U	1 U	0.95 U	2 U	1.2 U	2 U	0.93 U	0.97 U	1.1 U	1 U
1,3-Dichlorobenzene	600	0.95 U	0.95 U	-	-	-	-	-	0.96 U	1 U	0.95 U	2 U	1.2 U	2 U	0.93 U	0.97 U	1.1 U	1 U
1,4-Dichlorobenzene	75	0.95 U	0.95 U	-	-	-	-	-	0.96 U	1 U	0.95 U	2 U	1.2 U	2 U	0.93 U	0.97 U	1.1 U	1 U
1-Methylnaphthalene	NA	0.95 U	0.95 U	-	-	-	-	-	0.96 U	1 U	0.95 U	2 U	1.2 U	2 U	0.93 U	0.97 U	1.1 U	1 U
2,2'-oxybis(1-Chloropropane)	46	1.9 U	1.9 U	-	-	-	-	-	1.9 U	2.1 U	1.9 U	4 U	2.4 U	4 U	1.9 U	1.9 U	2.2 U	2 U
2,4,5-Trichlorophenol	NA	4.8 U	4.8 U	-	-	-	-	-	4.8 U	5.2 U	4.8 U	10 U	6.1 U	10 U	4.6 U	4.9 U	5.6 U	5.1 U
2,4,6-Trichlorophenol	NA	4.8 U	4.8 U	-	-	-	-	-	4.8 U	5.2 U	4.8 U	10 U	6.1 U	10 U	4.6 U	4.9 U	5.6 U	5.1 U
2,4-Dichlorophenol	NA	1.9 U	1.9 U	-	-	-	-	-	1.9 U	2.1 U	1.9 U	4 U	2.4 U	4 U	1.9 U	1.9 U	2.2 U	2 U
2,4-Dimethylphenol	NA	4.8 U	4.8 U	-	-	-	-	-	4.8 U	5.2 U	4.8 U	10 U	6.1 U	10 U	4.6 U	4.9 U	5.6 U	5.1 U
2,4-Dinitrophenol	NA	4.8 U	4.8 U	-	-	-	-	-	4.8 U	5.2 U	4.8 U	10 U	6.1 U	10 U	4.6 U	4.9 U	5.6 U	5.1 U
2,4-Dinitrotoluene	NA	0.95 U	0.95 U	-	-	-	-	-	0.96 U	1 U	0.95 U	2 U	1.2 U	2 U	0.93 U	0.97 U	1.1 U	1 U
2,6-Dinitrotoluene	NA	0.95 U	0.95 U	-	-	-	-	-	0.96 U	1 U	0.95 U	2 U	1.2 U	2 U	0.93 U	0.97 U	1.1 U	1 U
2-Chloronaphthalene	NA	1.9 U	1.9 U	-	-	-	-	-	1.9 U	2.1 U	1.9 U	4 U	2.4 U	4 U	1.9 U	1.9 U	2.2 U	2 U
2-Chlorophenol	NA	4.8 U	4.8 U	-	-	-	-	-	4.8 U	5.2 U	4.8 U	10 U	6.1 U	10 U	4.6 U	4.9 U	5.6 U	5.1 U
2-Methylnaphthalene	NA	0.95 U	0.95 U	-	-	-	-	-	0.96 U	1 U	0.95 U	2 U	1.2 U	2 U	0.93 U	0.97 U	1.1 U	1 U
2-Methylphenol (o-Cresol)	NA	1.9 U	1.9 U	-	-	-	-	-	1.9 U	2.1 U	1.9 U	4 U	2.4 U	4 U	1.9 U	1.9 U	2.2 U	2 U
2-Nitroaniline	NA	4.8 U	4.8 U	-	-	-	-	-	4.8 U	5.2 U	4.8 U	10 U	6.1 U	10 U	4.6 U	4.9 U	5.6 U	5.1 U
2-Nitrophenol	NA	4.8 U	4.8 U	-	-	-	-	-	4.8 U	5.2 U	4.8 U	10 U	6.1 U	10 U	4.6 U	4.9 U	5.6 U	5.1 U
3&4-Methylphenol	NA	1.9 U	1.9 U	-	-	-	-	-	1.9 U	2.1 U	1.9 U	4 U	2.4 U	4 U	1.9 U	1.9 U	2.2 U	2 U
3,3'-Dichlorobenzidine	NA	1.9 U	1.9 U	-	-	-	-	-	1.9 U	2.1 U	1.9 U	4 U	2.4 U	4 U	1.9 U	1.9 U	2.2 U	2 U
3-Nitroaniline	NA	4.8 U	4.8 U	-	-	-	-	-	4.8 U	5.2 U	4.8 U	10 U	6.1 U	10 U	4.6 U	4.9 U	5.6 U	5.1 U
4,6-Dinitro-2-methylphenol	NA	4.8 U	4.8 U	-	-	-	-	-	4.8 U	5.2 U	4.8 U	10 U	6.1 U	10 U	4.6 U	4.9 U	5.6 U	5.1 U
4-Bromophenyl phenyl ether	NA	1.9 U	1.9 U	-	-	-	-	-	1.9 U	2.1 U	1.9 U	4 U	2.4 U	4 U	1.9 U	1.9 U	2.2 U	2 U
4-Chloro-3-methylphenol	NA	4.8 U	4.8 U	-	-	-	-	-	4.8 U	5.2 U	4.8 U	10 U	6.1 U	10 U	4.6 U	4.9 U	5.6 U	5.1 U
4-Chloroaniline	NA	4.8 U	4.8 U	-	-	-	-	-	4.8 U	5.2 U	4.8 U	10 U	6.1 U	10 U	4.6 U	4.9 U	5.6 U	5.1 U
4-Chlorophenyl phenyl ether	NA	1.9 U	1.9 U	-	-	-	-	-	1.9 U	2.1 U	1.9 U	4 U	2.4 U	4 U	1.9 U	1.9 U	2.2 U	2 U
4-Nitroaniline	NA	4.8 U	4.8 U	-	-	-	-	-	4.8 U	5.2 U	4.8 U	10 U	6.1 U	10 U	4.6 U	4.9 U	5.6 U	5.1 U
4-Nitrophenol	NA	9.5 U	9.5 U	-	-	-	-	-	9.6 U	10 U	9.5 U	20 U	12 U	20 U	9.3 U	9.7 U	11 U	10 U
Acenaphthene	NA	0.95 U	0.95 U	-	-	-	-	-	0.96 U	1 U	0.95 U	2 U	1.2 U	2 U	0.93 U	0.97 U	1.1 U	1 U
Acenaphthylene	NA	0.95 U	0.95 U	-	-	-	-	-	0.96 U	1 U	0.95 U	2 U	1.2 U	2 U	0.93 U	0.97 U	1.1 U	1 U
Aniline	NA	1.9 U	1.9 U	-	-	-	-	-	1.9 U	2.1 U	1.9 U	4 U	2.4 U	4 U	1.9 U	1.9 U	2.2 U	2 U
Anthracene	343	0.95 U	0.95 U	-	-	-	-	-	0.96 U	1 U	0.95 U	2 U	1.2 U	2 U	0.93 U	0.97 U	1.1 U	1 U
Benzidine	NA	9.5 U	9.5 U	-	-	-	-	-	9.6 UJ	10 UJ	9.5 U	20 UJ	12 UJ	20 UJ	9.3 U	9.7 U	11 U	10 U
Benzo(a)anthracene	NA	0.95 U	0.95 U	-	-	-	-	-	0.96 U	1 U	0.95 U	2 U	1.2 U	2 U	0.93 U	0.97 U	1.1 U	1 U
Benzo(a)pyrene	0.2	**0.95 U**	**0.95 U**	-	-	-	-	-	**0.96 U**	**1 U**	**0.95 U**	**2 U**	**1.2 U**	**2 U**	**0.93 U**	**0.97 U**	**1.1 U**	**1 U**
Benzo(b)fluoranthene	NA	0.95 U	0.95 U	-	-	-	-	-	0.96 U	1 U	0.95 U	2 U	1.2 U	2 U	0.93 U	0.97 U	1.1 U	1 U
Benzo(g,h,i)perylene	NA	0.95 U	0.95 U	-	-	-	-	-	0.96 U	1 U	0.95 U	2 U	1.2 U	2 U	0.93 U	0.97 U	1.1 U	1 U
Benzo(k)fluoranthene	NA	0.95 U	0.95 U	-	-	-	-	-	0.96 U	1 U	0.95 U	2 U	1.2 U	2 U	0.93 U	0.97 U	1.1 U	1 U
Benzoic acid	NA	19 U	19 U	-	-	-	-	-	19 U	21 U	19 U	40 U	24 U	40 U	19 U	19 U	22 U	20 U
Benzyl Alcohol	NA	1.9 U	1.9 U	-	-	-	-	-	1.9 U	2.1 U	1.9 U	4 U	2.4 U	4 U	1.9 U	1.9 U	2.2 U	2 U
bis(2-Chloroethoxy)methane	NA	1.9 U	1.9 U	-	-	-	-	-	1.9 U	2.1 U	1.9 U	4 U	2.4 U	4 U	1.9 U	1.9 U	2.2 U	2 U
bis(2-Chloroethyl)ether	NA	1.9 U	1.9 U	-	-	-	-	-	1.9 U	2.1 U	1.9 U	4 U	2.4 U	4 U	1.9 U	1.9 U	2.2 U	2 U
bis(2-Ethylhexyl)phthalate	6	1.9 U	1.9 U	-	-	-	-	-	1.9 U	2.1 U	1.9 U	4 U	3.6	4 U	1.9 U	1.9 U	2.2 U	2 U
Butyl benzylphthalate	NA	1.9 U	1.9 U	-	-	-	-	-	1.9 U	2.1 U	1.9 U	4 U	2.4 U	4 U	1.9 U	1.9 U	2.2 U	2 U
Carbazole	NA	0.95 U	0.95 U	-	-	-	-	-	0.96 U	1 U	0.95 U	2 U	1.2 U	2 U	0.93 U	0.97 U	1.1 U	1 U
Chrysene	NA	0.95 U	0.95 U	-	-	-	-	-	0.96 U	1 U	0.95 U	2 U	1.2 U	2 U	0.93 U	0.97 U	1.1 U	1 U
Dibenz(a,h)anthracene	NA	0.95 U	0.95 U	-	-	-	-	-	0.96 U	1 U	0.95 U	2 U	1.2 U	2 U	0.93 U	0.97 U	1.1 U	1 U
Dibenzofuran	NA	4.8 U	4.8 U	-	-	-	-	-	4.8 U	5.2 U	4.8 U	10 U	6.1 U	10 U	4.6 U	4.9 U	5.6 U	5.1 U
Diethyl phthalate	NA	1.9 U	1.9 U	-	-	-	-	-	1.9 U	0.33 J	1.9 U	4 U	1.5 J	4.3	6.1	6.8	7.4	21.6
Dimethyl phthalate	NA	1.9 U	1.9 U	-	-	-	-	-	1.9 U	2.1 U	1.9 U	4 U	2.4 U	4 U	3.7	4.6	2.8	10.8
Di-n-butylphthalate	NA	1.9 U	1.9 U	-	-	-	-	-	1.9 U	2.1 U	1.9 U	4 U	1.5 J	4 U	1.9 U	1.9 U	2.2 U	2 U
Di-n-octyl phthalate	NA	1.9 U	1.9 U	-	-	-	-	-	1.9 U	2.1 U	1.9 U	4 U	2.4 U	4 U	1.9 U	1.9 U	2.2 U	2 U
Fluoranthene	46	0.95 U	0.95 U	-	-	-	-	-	0.96 U	1 U	0.26 J	2 U	1.2 U	2 U	0.93 U	0.97 U	1.1 U	1 U
Fluorene	46	0.95 U	0.95 U	-	-	-	-	-	0.96 U	0.32 J	0.95 U	2 U	1.2 U	2 U	0.93 U	0.97 U	1.1 U	1 U
Hexachlorobenzene	1	0.95 U	0.95 U	-	-	-	-	-	0.96 U	1 U	0.95 U	**2 U**	**1.2 U**	**2 U**	0.93 U	0.97 U	**1.1 U**	1 U
Hexachlorobutadiene	NA	0.95 U	0.95 U	-	-	-	-	-	0.96 U	1 U	0.95 U	2 U	1.2 U	2 U	0.93 U	0.97 U	1.1 U	1 U
Hexachlorocyclopentadiene	50	9.5 U	9.5 U	-	-	-	-	-	9.6 U	10 U	9.5 U	20 U	12 U	20 U	9.3 U	9.7 U	11 U	10 U
Hexachloroethane	NA	1.9 U	1.9 U	-	-	-	-	-	1.9 U	2.1 U	1.9 U	4 U	2.4 U	4 U	1.9 U	1.9 U	2.2 U	2 U
Indeno(1,2,3-cd)pyrene	NA	0.95 U	0.95 U	-	-	-	-	-	0.96 U	1 U	0.95 U	2 U	1.2 U	2 U	0.93 U	0.97 U	1.1 U	1 U
Isophorone	NA	1.9 U	1.9 U	-	-	-	-	-	1.9 U	2.1 U	1.9 U	4 U	2.4 U	4 U	1.9 U	1.9 U	2.2 U	2 U
Naphthalene	0.5	**0.95 U**	**0.95 U**	-	-	-	-	-	**0.96 U**	**1 U**	**0.95 U**	**2 U**	**1.2 U**	**2 U**	**0.93 U**	**0.97 U**	**1.1 U**	**1 U**
Nitrobenzene	NA	1.9 U	1.9 U	-	-	-	-	-	1.9 U	2.1 U	1.9 U	4 U	2.4 U	4 U	1.9 U	1.9 U	2.2 U	2 U
N-Nitrosodimethylamine	NA	1.9 U	1.9 U	-	-	-	-	-	1.9 U	2.1 U	1.9 U	4 U	2.4 U	4 U	1.9 U	1.9 U	2.2 U	2 U
N-Nitrosodi-n-propylamine	NA	1.9 U	1.9 U	-	-	-	-	-	1.9 U	2.1 U	1.9 U	4 U	2.4 U	4 U	1.9 U	1.9 U	2.2 U	2 U
N-Nitrosodiphenylamine	NA	4.8 U	4.8 U	-	-	-	-	-	4.8 U	5.2 U	4.8 U	10 U	6.1 U	10 U	4.6 U	4.9 U	5.6 U	5.1 U
Pentachlorophenol	1	**3.8 U**	**3.8 U**	-	-	-	-	-	**3.8 U**	**4.1 U**	**3.8 U**	**8 U**	**4.9 U**	**8 U**	**3.7 U**	**3.9 U**	**4.5 U**	**4.1 U**
Phenanthrene	NA	0.95 U	0.95 U	-	-	-	-	-	0.96 U	1 U	1.1	2 U	1.2 U	2 U	0.22 J	0.38 J	1.1 U	1 U
Phenol	NA	1.9 U	1.9 U	-	-	-	-	-	1.9 U	2.1 U	1.9 U	4 U	2.4 U	4 U	1.9 U	1.9 U	2.2 U	2 U
Pyrene	NA	0.95 U	0.95 U	-	-	-	-	-	0.96 U	1 U	0.23 J	2 U	1.2 U	2 U	0.93 U	0.97 U	1.1 U	1 U
Pyridine	NA	1.9 U	1.9 U	-	-	-	-	-	1.9 U	2.1 U	1.9 U	4 U	2.4 U	4 U	1.9 U	1.9 U	2.2 U	2 U
Total Petroleum Hydrocarbons (ug/L)																		
Total Petroleum Hydrocarbons (C10-C28) DRO	NA	-	-	-	-	-	-	-	83 U	83 U	83 U	83 U	-	255	83 UJ	83 UJ	83 UJ	83 UJ
Total Petroleum Hydrocarbons (C6-C10) GRO	NA	-	-	-	-	-	-	-	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U	200 U

TABLE 6-3
SUMMARY OF GROUNDWATER ANALYTICAL DATA
VERMONT YANKEE
VERNON, VERMONT

Location Name	VT ANR	DP0601	DP0602	DP0807	DP0808	DP1001	DP1002	DP1003	DP1201	DP1202	DP1209	DP1306	DP1307	DP1308	DP1309	DP1309	DP1310	DP1311
Sample Name	Proposed 2019	GW0601-20190515	GW0602-20190515	GW0807-20190503	GW0808-20190503	GW1001-20190429	GW1002-20190429	GW1003-20190429	GW1201-20190509	GW1202-20190509	GW1209-20190426	GW1306-20190508	GW1307-20190508	GW1308-20190508	GW1309-20190429	GW1309DUP-20190429	GW1310-20190429	GW1311-20190429
Sample Date	Groundwater	05/15/2019	05/15/2019	05/03/2019	05/03/2019	04/29/2019	04/29/2019	04/29/2019	05/09/2019	05/09/2019	04/26/2019	05/08/2019	05/08/2019	05/08/2019	04/29/2019	04/29/2019	04/29/2019	04/29/2019
	Enforcement			B3259_16698_DF_002	B3259_16671_DF_001													
Lab Sample ID	Standard	JC88303-2	JC88303-1	JC87576-2	JC87576-1	JC87443-4	JC87443-3	JC87443-1	JC87972-2	JC87972-3	JC87127-6	JC87972-5	JC87972-6	JC87972-1	JC87443-6	JC87443-7	JC87443-2	JC87443-5
Inorganic Compounds (ug/L)																		
Phosphorus, Dissolved	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Aluminum, Total	NA	116000	128000	-	-	-	-	-	230000	539000	6430	26600	22600	33200	163000 J	88500 J	118000	458000
Antimony, Total	NA	30 U	30 U	-	-	-	-	-	60 U	300 U	6 U	12 U	6 U	12 U	30 U	30 U	60 U	49
Arsenic, Total	10	**66.5**	**54.5**	-	-	-	-	-	**125**	**635**	9.3	**23.2**	**15.6**	**16.6**	**37.5**	**22.5**	**36.5**	**95**
Barium, Total	2000	1740	1000 U	-	-	-	-	-	**2170**	**10000 U**	200 U	400 U	247	400 U	1000 U	1000 U	1000 U	1960
Beryllium, Total	4	**5 U**	**5 U**	-	-	-	-	-	**10**	**50 U**	1 U	2 U	1.4	2 U	**5 U**	**5 U**	**5 U**	**15.5**
Cadmium, Total	5	**15 U**	**15 U**	-	-	-	-	-	**30 U**	**150 U**	3 U	**6 U**	3 U	**6 U**	**15 U**	**15 U**	**15 U**	**15 U**
Calcium, Total	NA	652000	117000	-	-	-	-	-	69500	250000 U	25800	54600	50300	42800	94300	102000	66700	173000
Chromium, Total	100	**209**	**220**	-	-	-	-	-	**467**	**1670**	34.2	46	62.1	78.4	**244 J**	**129 J**	**198**	**780**
Cobalt, Total	NA	250 U	250 U	-	-	-	-	-	500 U	2500 U	50 U	100 U	50 U	100 U	250 U	250 U	250 U	385
Copper, Total	1300	204	205	-	-	-	-	-	493	**1770**	26	71	61.3	74.6	250	162	208	900
Iron, Total	NA	170000	171000	-	-	-	-	-	383000	1590000	13800	59200	48400	56600	242000 J	113000 J	191000	754000
Lead, Total	15	**62.5**	**56**	-	-	-	-	-	**250**	**530**	8	**16.8**	15 U	**20.4**	**62.5**	**42.5**	**62**	**190**
Magnesium, Total	NA	88300	50300	-	-	-	-	-	84700	250000 U	6710	19800	13600	19100	77800 J	44600 J	63800	249000
Manganese, Total	300	**28900**	**32400**	-	-	-	-	-	**31800**	**105000**	**3480**	**2580**	**13700**	**4030**	**3570**	**2750**	**2740**	**13700**
Mercury, Total	NA	0.2 U	0.21	-	-	-	-	-	5.9	2	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U
Nickel, Total	100	**222**	**229**	-	-	-	-	-	**656**	**1990**	63	67.6	68.8	71.8	**287 J**	**148 J**	**209**	**913**
Potassium, Total	NA	50000 U	50000 U	-	-	-	-	-	100000 U	500000 U	10000 U	20000 U	10000 U	20000 U	50000 U	50000 U	50000 U	83700
Selenium, Total	50	50 U	50 U	-	-	-	-	-	**100 U**	**500 U**	10 U	20 U	50 U	20 U	50 U	50 U	50 U	50 U
Silver, Total	NA	50 U	50 U	-	-	-	-	-	100 U	500 U	10 U	20 U	10 U	20 U	50 U	50 U	50 U	50 U
Sodium, Total	NA	1690000	979000	-	-	-	-	-	100000 U	500000 U	98200	58700	210000	20000 U	50000 U	50000 U	50000 U	50000 U
Thallium, Total	2	**50 U**	**50 U**	-	-	-	-	-	**100 U**	**500 U**	**10 U**	**20 U**	**50 U**	**20 U**	**50 U**	**50 U**	**50 U**	**50 U**
Vanadium, Total	NA	250 U	250 U	-	-	-	-	-	500 U	2500 U	50 U	100 U	100 U	100 U	319	250 U	250 U	918
Zinc, Total	NA	466	527	-	-	-	-	-	923	2480	54	115	103	118	563 J	319 J	427	1700
PCBs (ug/L)																		
Aroclor-1016 (PCB-1016)	NA	0.33 U	0.33 U	-	-	-	-	-	-	-	0.33 U	-	-	-	-	-	-	-
Aroclor-1221 (PCB-1221)	NA	0.33 U	0.33 U	-	-	-	-	-	-	-	0.33 U	-	-	-	-	-	-	-
Aroclor-1232 (PCB-1232)	NA	0.33 U	0.33 U	-	-	-	-	-	-	-	0.33 U	-	-	-	-	-	-	-
Aroclor-1242 (PCB-1242)	NA	0.33 U	0.33 U	-	-	-	-	-	-	-	0.33 U	-	-	-	-	-	-	-
Aroclor-1248 (PCB-1248)	NA	0.33 U	0.33 U	-	-	-	-	-	-	-	0.33 U	-	-	-	-	-	-	-
Aroclor-1254 (PCB-1254)	NA	0.33 U	0.33 U	-	-	-	-	-	-	-	0.33 U	-	-	-	-	-	-	-
Aroclor-1260 (PCB-1260)	NA	0.33 U	0.33 U	-	-	-	-	-	-	-	0.33 U	-	-	-	-	-	-	-
Aroclor-1262 (PCB-1262)	NA	0.33 U	0.33 U	-	-	-	-	-	-	-	0.33 U	-	-	-	-	-	-	-
Aroclor-1268 (PCB-1268)	NA	0.33 U	0.33 U	-	-	-	-	-	-	-	0.33 U	-	-	-	-	-	-	-
SUM of PCBs		ND	ND	-	-	-	-	-	-	-	ND	-	-	-	-	-	-	-
Dioxins/Furans (ug/L)																		
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	NA	-	-	0.0000996 U	0.00000132 U	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	NA	-	-	0.0000996 U	0.0000273 J	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	NA	-	-	0.0000498 U	0.000000669 U	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	NA	-	-	0.00000448 U	0.00000113 J	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	NA	-	-	0.0000136 U	0.0000007 U	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	NA	-	-	0.0000498 U	0.000000631 U	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	NA	-	-	0.00000423 U	0.00000068 U	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	NA	-	-	0.0000106 U	0.000000634 U	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	NA	-	-	0.00000427 U	0.000000685 U	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	NA	-	-	0.0000114 U	0.000000763 U	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	NA	-	-	0.00000402 U	0.000000939 J	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	NA	-	-	0.00000578 U	0.000000653 U	-	-	-	-	-	-	-	-	-	-	-	-	-
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	NA	-	-	0.00000617 U	0.000000995 U	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	NA	-	-	0.0000114 U	0.000000654 U	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	NA	-	-	0.00000558 U	0.000000669 U	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	NA	-	-	0.00000439 U	0.000000851 U	-	-	-	-	-	-	-	-	-	-	-	-	-
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	3.00E-05	-	-	0.00000522 U	0.00000123 U	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Heptachlorodibenzofuran (HpCDF)	NA	-	-	0.0000498 U	0.000000684 U	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Heptachlorodibenzo-p-dioxin (HpCDD)	NA	-	-	0.00000448 U	0.0000023 J	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Hexachlorodibenzofuran (HxCDF)	NA	-	-	0.0000172 J	0.000000666 U	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Hexachlorodibenzo-p-dioxin (HxCDD), Mixture	NA	-	-	0.00000416 U	0.000000939	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Pentachlorodibenzofuran (PeCDF)	NA	-	-	0.00000568 U	0.000000661 U	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Pentachlorodibenzo-p-dioxin (PeCDD)	NA	-	-	0.00000617 U	0.000000995 U	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Tetrachlorodibenzofuran (TCDF)	NA	-	-	0.00000439 U	0.000000851 U	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Tetrachlorodibenzo-p-dioxin (TCDD)	NA	-	-	0.00000522 U	0.00000123 U	-	-	-	-	-	-	-	-	-	-	-	-	-
Field Parameters																		
Temperature (Deg C)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Conductivity, Field (mS/cm)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ORP, Field (mv)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Turbidity, Field (NTU)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
pH, Field (pH units)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Dissolved Oxygen, Field (ug/L)	NA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Herbicides (ug/L)																		
2,4,5-T	70	-	-	-	-	0.083 U	0.083 U	0.083 U	-	-	-	-	-	-	-	-	-	-
2,4,5-TP (Silvex)	50	-	-	-	-	0.083 U	0.083 U	0.083 U	-	-	-	-	-	-	-	-	-	-
2,4-Dichlorophenoxyacetic acid (2,4-D)	70	-	-	-	-	0.42 U	0.42 U	0.42 U	-	-	-	-	-	-	-	-	-	-
Dalapon	200	-	-	-	-	0.083 U	0.083 U	0.083 U	-	-	-	-	-	-	-	-	-	-
Dichloroprop	140	-	-	-	-	0.42 U	0.42 U	0.42 U	-	-	-	-	-	-	-	-	-	-
Dinoseb	7	-	-	-	-	0.42 U	0.42 U	0.42 U	-	-	-	-	-	-	-	-	-	-

TABLE 6-3
SUMMARY OF GROUNDWATER ANALYTICAL DATA
VERMONT YANKEE
VERNON, VERMONT

Location Name	VT ANR	DP0601	DP0602	DP0807	DP0808	DP1001	DP1002	DP1003	DP1201	DP1202	DP1209	DP1306	DP1307	DP1308	DP1309	DP1309	DP1310	DP1311
Sample Name	Proposed 2019	GW0601-20190515	GW0602-20190515	GW0807-20190503	GW0808-20190503	GW1001-20190429	GW1002-20190429	GW1003-20190429	GW1201-20190509	GW1202-20190509	GW1209-20190426	GW1306-20190508	GW1307-20190508	GW1308-20190508	GW1309-20190429	GW1309DUP-20190429	GW1310-20190429	GW1311-20190429
Sample Date	Groundwater	05/15/2019	05/15/2019	05/03/2019	05/03/2019	04/29/2019	04/29/2019	04/29/2019	05/09/2019	05/09/2019	04/26/2019	05/08/2019	05/08/2019	05/08/2019	04/29/2019	04/29/2019	04/29/2019	04/29/2019
	Enforcement			B3259_16698_DF_002	B3259_16671_DF_001													
Lab Sample ID	Standard	JC88303-2	JC88303-1	JC87576-2	JC87576-1	JC87443-4	JC87443-3	JC87443-1	JC87972-2	JC87972-3	JC87127-6	JC87972-5	JC87972-6	JC87972-1	JC87443-6	JC87443-7	JC87443-2	JC87443-5
Pesticides (ug/L)																		
4,4'-DDD	NA	-	-	-	-	0.0067 U	0.0067 U	0.0067 U	-	-	-	-	-	-	-	-	-	-
4,4'-DDE	NA	-	-	-	-	0.0067 U	0.0067 U	0.0067 U	-	-	-	-	-	-	-	-	-	-
4,4'-DDT	NA	-	-	-	-	0.0067 U	0.0067 U	0.0067 U	-	-	-	-	-	-	-	-	-	-
Aldrin	0.1	-	-	-	-	0.0067 U	0.0067 U	0.0067 U	-	-	-	-	-	-	-	-	-	-
alpha-BHC	NA	-	-	-	-	0.0067 U	0.0067 U	0.0067 U	-	-	-	-	-	-	-	-	-	-
alpha-Chlordane	NA	-	-	-	-	0.0067 U	0.0067 U	0.0067 U	-	-	-	-	-	-	-	-	-	-
beta-BHC	NA	-	-	-	-	0.0055 J	0.0082 J	0.011 J	-	-	-	-	-	-	-	-	-	-
delta-BHC	NA	-	-	-	-	0.0067 U	0.0067 U	0.0067 U	-	-	-	-	-	-	-	-	-	-
Dieldrin	0.02	-	-	-	-	0.0067 U	0.0067 U	0.0067 U	-	-	-	-	-	-	-	-	-	-
Endosulfan I	NA	-	-	-	-	0.0067 U	0.0067 U	0.0067 U	-	-	-	-	-	-	-	-	-	-
Endosulfan II	NA	-	-	-	-	0.0067 U	0.0067 U	0.0067 U	-	-	-	-	-	-	-	-	-	-
Endosulfan sulfate	NA	-	-	-	-	0.0067 U	0.0067 U	0.0067 U	-	-	-	-	-	-	-	-	-	-
Endrin	2	-	-	-	-	0.0067 U	0.0067 U	0.0067 U	-	-	-	-	-	-	-	-	-	-
Endrin aldehyde	NA	-	-	-	-	0.0067 UJ	0.0067 UJ	0.0067 UJ	-	-	-	-	-	-	-	-	-	-
Endrin ketone	NA	-	-	-	-	0.0067 U	0.0067 U	0.0067 U	-	-	-	-	-	-	-	-	-	-
gamma-BHC (Lindane)	0.2	-	-	-	-	0.0067 U	0.0067 U	0.0067 U	-	-	-	-	-	-	-	-	-	-
gamma-Chlordane	NA	-	-	-	-	0.0067 U	0.0067 U	0.0067 U	-	-	-	-	-	-	-	-	-	-
Heptachlor	0.4	-	-	-	-	0.0067 U	0.0067 U	0.0067 U	-	-	-	-	-	-	-	-	-	-
Heptachlor epoxide	0.2	-	-	-	-	0.0067 U	0.0067 U	0.0067 U	-	-	-	-	-	-	-	-	-	-
Methoxychlor	40	-	-	-	-	0.013 U	0.013 U	0.013 U	-	-	-	-	-	-	-	-	-	-
Toxaphene	3	-	-	-	-	0.17 U	0.17 U	0.17 U	-	-	-	-	-	-	-	-	-	-
PFAS (ug/L)																		
Fluorotelomer sulfonic acid (4:2 FTSA)	NA	-	-	0.008 U	0.008 U	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorotelomer sulfonic acid (6:2 FTSA)	NA	-	-	0.008 U	0.008 U	-	-	-	-	-	-	-	-	-	-	-	-	-
Fluorotelomer sulfonic acid (8:2 FTSA)	NA	-	-	0.008 U	0.008 U	-	-	-	-	-	-	-	-	-	-	-	-	-
N-ethyl perfluorooctane sulfonamidoacetic acid (N-EtFOSAA)	NA	-	-	0.02 U	0.02 U	-	-	-	-	-	-	-	-	-	-	-	-	-
N-methyl perfluorooctane sulfonamidoacetic acid (N-MeFOSAA)	NA	-	-	0.02 U	0.02 U	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorobutanesulfonic Acid (PFBS)	NA	-	-	0.0157	0.0134	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorobutanoic Acid (PFBA)	NA	-	-	0.0863	0.00766 J	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorodecane sulfonic Acid (PFDS)	NA	-	-	0.004 U	0.004 U	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorodecanoic acid (PFDA)	NA	-	-	0.004 U	0.004 U	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorododecanoic acid (PFDoDA)	NA	-	-	0.004 U	0.004 U	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluoroheptane sulfonic acid (PFHpS)	NA	-	-	0.004 U	0.004 U	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluoroheptanoic acid (PFHpA)	0.02	-	-	**0.141**	0.00825	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorohexanesulfonic acid (PFHxS)	0.02	-	-	0.00113 J	0.004 U	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorohexanoic acid (PFHxA)	NA	-	-	0.157	0.00488	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorononane sulfonic acid (PFNS)	NA	-	-	0.004 U	0.004 U	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorononanoic Acid (PFNA)	0.02	-	-	0.004 U	0.004 U	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorooctane sulfonamide (FOSA)	NA	-	-	0.004 U	0.004 U	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorooctanesulfonic acid (PFOS)	0.02	-	-	0.004 U	0.00184 J	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorooctanoic Acid (PFOA)	0.02	-	-	0.00565	0.00905	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluoropentane sulfonic acid (PFPeS)	NA	-	-	0.004 U	0.004 U	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluoropentanoic Acid (PFPeA)	NA	-	-	0.118	0.00478	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorotetradecanoic acid (PFTeDA)	NA	-	-	0.004 U	0.004 U	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluorotridecanoic acid (PFTrDA)	NA	-	-	0.004 U	0.004 U	-	-	-	-	-	-	-	-	-	-	-	-	-
Perfluoroundecanoic acid (PFUnA)	NA	-	-	0.004 U	0.004 U	-	-	-	-	-	-	-	-	-	-	-	-	-
SUM of PFAS (ND = 0)	0.02	-	-	**0.14778**	0.01914	-	-	-	-	-	-	-	-	-	-	-	-	-
SUM of PFAS (ND = 1/2 RL)	0.02	-	-	**0.15178**	**0.02314**	-	-	-	-	-	-	-	-	-	-	-	-	-

ABBREVIATIONS AND NOTES:
-: Not Analyzed
J: valued is estimated
J+: valued is estimated with a potential high bias
mS/cm: milliSiemen per centimeter
mv: millivolt
NA: Not Applicable
NTU: Nephelometric Turbidiy Units
RSL: Risk-Based Screening Levels
U: Not detected, value is the laboratory reporting limit
ug/L: microgram per liter
USEPA: United States Environmental Protection Agency
VT ANR: Vermont Agency of Natural Resources

- Volatile and Semi-Volatile analytes detected in at least one sample are reported herein.
  For a complete list of analytes see the laboratory data sheets.
- Bold values indicate an exceedance of the VT ANR Proposed 2019 Groundwater
  Enforcement Standard.

TABLE 6-3
SUMMARY OF GROUNDWATER ANALYTICAL DATA
VERMONT YANKEE
VERNON, VERMONT

Location Name Sample Name Sample Date Lab Sample ID	VT ANR Proposed 2019 Groundwater Enforcement Standard	DP1501 GW1501-20190514 05/14/2019 JC88348-2	DP1501 GW1501-20190514 DUP 05/14/2019 JC88348-3	DP1502 GW1502-20190426 04/26/2019 JC87127-1	DP1503 GW1503-20190515 05/16/2019 JC88303-3	DP1504 GW1504-20190426 04/26/2019 JC87127-2	DP1505 GW1505-20190510 05/10/2019 JC87972-4	DP1506 GW1506-20190426 04/26/2019 JC87127-3	DP1507 GW1507-20190426 04/26/2019 JC87127-4	DP1508 GW1508-20190513 05/13/2019 JC88348-1
Volatile Organic Compounds (ug/L)										
1,1,1,2-Tetrachloroethane	70	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,1-Trichloroethane	200	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2,2-Tetrachloroethane	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1,2-Trichloroethane	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethane	70	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloroethene	7	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,1-Dichloropropene	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2,3-Trichlorobenzene	0.9	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**
1,2,3-Trichloropropane	0.02	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**
1,2,4-Trichlorobenzene	70	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2,4-Trimethylbenzene	23	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,2-Dibromo-3-chloropropane (DBCP)	0.2	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**	**2 U**
1,2-Dibromoethane (Ethylene Dibromide)	0.05	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**	**1 U**
1,2-Dichlorobenzene	600	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloroethane	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,2-Dichloropropane	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,3,5-Trimethylbenzene	23	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
1,3-Dichlorobenzene	600	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,3-Dichloropropane	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
1,4-Dichlorobenzene	75	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2,2-Dichloropropane	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
2-Butanone (Methyl Ethyl Ketone)	511	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Chlorotoluene	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
2-Phenylbutane (sec-Butylbenzene)	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
4-Chlorotoluene	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
4-Methyl-2-Pentanone (Methyl Isobutyl Ketone)	NA	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U
Acetone	950	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U
Benzene	5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Bromobenzene	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromodichloromethane	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	2.5
Bromoform	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Bromomethane (Methyl Bromide)	5	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Carbon tetrachloride	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobenzene	100	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chlorobromomethane	8	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroethane	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Chloroform (Trichloromethane)	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	8.6
Chloromethane (Methyl Chloride)	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
cis-1,2-Dichloroethene	70	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
cis-1,3-Dichloropropene	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Cymene (p-Isopropyltoluene)	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Dibromochloromethane	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.67 J
Dibromomethane	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Dichlorodifluoromethane (CFC-12)	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Ethylbenzene	700	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Hexachlorobutadiene	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Isopropylbenzene (Cumene)	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
m,p-Xylenes	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Methyl Tert Butyl Ether	11	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Methylene chloride	5	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Naphthalene	0.5	**5 U**	**5 U**	**5 U**	**5 U**	**5 U**	**5 U**	**5 U**	**5 U**	**5 U**
n-Butylbenzene	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
n-Propylbenzene	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
o-Xylene	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Styrene	100	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
tert-Butylbenzene	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Tetrachloroethene	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Toluene	1000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,2-Dichloroethene	100	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
trans-1,3-Dichloropropene	NA	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichloroethene	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Trichlorofluoromethane (CFC-11)	NA	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U	2 U
Vinyl chloride	2	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Xylene (total)	10000	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U

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VERNON, VERMONT

Location Name Sample Name Sample Date Lab Sample ID	VT ANR Proposed 2019 Groundwater Enforcement Standard	DP1501 GW1501-20190514 05/14/2019 JC88348-2	DP1501 GW1501-20190514 DUP 05/14/2019 JC88348-3	DP1502 GW1502-20190426 04/26/2019 JC87127-1	DP1503 GW1503-20190515 05/16/2019 JC88303-3	DP1504 GW1504-20190426 04/26/2019 JC87127-2	DP1505 GW1505-20190510 05/10/2019 JC87972-4	DP1506 GW1506-20190426 04/26/2019 JC87127-3	DP1507 GW1507-20190426 04/26/2019 JC87127-4	DP1508 GW1508-20190513 05/13/2019 JC88348-1
Semi-Volatile Organic Compounds (ug/L)										
1,2,4-Trichlorobenzene	70	-	-	-	-	-	-	-	0.99 U	0.98 U
1,2-Dichlorobenzene	600	-	-	-	-	-	-	-	0.99 U	0.98 U
1,2-Diphenylhydrazine	NA	-	-	-	-	-	-	-	0.99 U	0.98 U
1,3-Dichlorobenzene	600	-	-	-	-	-	-	-	0.99 U	0.98 U
1,4-Dichlorobenzene	75	-	-	-	-	-	-	-	0.99 U	0.98 U
1-Methylnaphthalene	NA	-	-	-	-	-	-	-	0.99 U	0.98 U
2,2'-oxybis(1-Chloropropane)	46	-	-	-	-	-	-	-	2 U	2 U
2,4,5-Trichlorophenol	NA	-	-	-	-	-	-	-	5 U	4.9 U
2,4,6-Trichlorophenol	NA	-	-	-	-	-	-	-	5 U	4.9 U
2,4-Dichlorophenol	NA	-	-	-	-	-	-	-	2 U	2 U
2,4-Dimethylphenol	NA	-	-	-	-	-	-	-	5 U	4.9 U
2,4-Dinitrophenol	NA	-	-	-	-	-	-	-	5 U	4.9 U
2,4-Dinitrotoluene	NA	-	-	-	-	-	-	-	0.99 U	0.98 U
2,6-Dinitrotoluene	NA	-	-	-	-	-	-	-	0.99 U	0.98 U
2-Chloronaphthalene	NA	-	-	-	-	-	-	-	2 U	2 UJ
2-Chlorophenol	NA	-	-	-	-	-	-	-	5 U	4.9 U
2-Methylnaphthalene	NA	-	-	-	-	-	-	-	0.99 U	0.98 U
2-Methylphenol (o-Cresol)	NA	-	-	-	-	-	-	-	2 U	2 U
2-Nitroaniline	NA	-	-	-	-	-	-	-	5 U	4.9 UJ
2-Nitrophenol	NA	-	-	-	-	-	-	-	5 U	4.9 U
3&4-Methylphenol	NA	-	-	-	-	-	-	-	2 U	2 U
3,3'-Dichlorobenzidine	NA	-	-	-	-	-	-	-	2 U	2 U
3-Nitroaniline	NA	-	-	-	-	-	-	-	5 U	4.9 U
4,6-Dinitro-2-methylphenol	NA	-	-	-	-	-	-	-	5 U	4.9 U
4-Bromophenyl phenyl ether	NA	-	-	-	-	-	-	-	2 U	2 U
4-Chloro-3-methylphenol	NA	-	-	-	-	-	-	-	5 U	4.9 U
4-Chloroaniline	NA	-	-	-	-	-	-	-	5 U	4.9 U
4-Chlorophenyl phenyl ether	NA	-	-	-	-	-	-	-	2 U	2 U
4-Nitroaniline	NA	-	-	-	-	-	-	-	5 U	4.9 U
4-Nitrophenol	NA	-	-	-	-	-	-	-	9.9 U	9.8 U
Acenaphthene	NA	0.98 U	0.98 U	0.99 U	0.95 U	1 U	1 U	0.99 U	0.99 U	0.98 U
Acenaphthylene	NA	0.98 U	0.98 U	0.99 U	0.95 U	1 U	1 U	0.99 U	0.99 U	0.98 U
Aniline	NA	-	-	-	-	-	-	-	2 U	2 U
Anthracene	343	0.98 U	0.98 U	0.99 U	0.95 U	0.25 J	1 U	0.99 U	0.99 U	0.98 U
Benzidine	NA	-	-	-	-	-	-	-	9.9 U	9.8 UJ
Benzo(a)anthracene	NA	0.98 U	0.98 U	0.99 U	0.95 U	1 U	1 U	0.99 U	0.99 U	0.98 U
Benzo(a)pyrene	0.2	**0.98 U**	**0.98 U**	**0.99 U**	**0.95 U**	**1 U**	**1 U**	**0.99 U**	**0.99 U**	**0.98 U**
Benzo(b)fluoranthene	NA	0.98 U	0.98 U	0.99 U	0.95 U	1 U	1 U	0.99 U	0.99 U	0.98 U
Benzo(g,h,i)perylene	NA	0.98 U	0.98 U	0.99 U	0.95 U	1 U	1 U	0.99 U	0.99 U	0.98 U
Benzo(k)fluoranthene	NA	0.98 U	0.98 U	0.99 U	0.95 U	1 U	1 U	0.99 U	0.99 U	0.98 U
Benzoic acid	NA	-	-	-	-	-	-	-	20 U	20 U
Benzyl Alcohol	NA	-	-	-	-	-	-	-	2 U	2 U
bis(2-Chloroethoxy)methane	NA	-	-	-	-	-	-	-	2 U	2 U
bis(2-Chloroethyl)ether	NA	-	-	-	-	-	-	-	2 U	2 U
bis(2-Ethylhexyl)phthalate	6	-	-	-	-	-	-	-	2 U	1.7 J
Butyl benzylphthalate	NA	-	-	-	-	-	-	-	2 U	1.9 J
Carbazole	NA	-	-	-	-	-	-	-	0.99 U	0.98 U
Chrysene	NA	0.98 U	0.98 U	0.99 U	0.95 U	1 U	1 U	0.99 U	0.99 U	0.98 U
Dibenz(a,h)anthracene	NA	0.98 U	0.98 U	0.99 U	0.95 U	1 U	1 U	0.99 U	0.99 U	0.98 U
Dibenzofuran	NA	-	-	-	-	-	-	-	5 U	4.9 U
Diethyl phthalate	NA	-	-	-	-	-	-	-	2 U	1.1 J
Dimethyl phthalate	NA	-	-	-	-	-	-	-	2 U	2 U
Di-n-butylphthalate	NA	-	-	-	-	-	-	-	2 U	2 U
Di-n-octyl phthalate	NA	-	-	-	-	-	-	-	2 U	2 U
Fluoranthene	46	0.98 U	0.98 U	0.99 U	0.95 U	0.56 J	1 U	0.99 U	0.99 U	0.98 U
Fluorene	46	0.98 U	0.98 U	0.99 U	0.95 U	0.34 J	1 U	0.99 U	0.19 J	0.98 U
Hexachlorobenzene	1	-	-	-	-	-	-	-	0.99 U	0.98 U
Hexachlorobutadiene	NA	-	-	-	-	-	-	-	0.99 U	0.98 U
Hexachlorocyclopentadiene	50	-	-	-	-	-	-	-	9.9 U	9.8 U
Hexachloroethane	NA	-	-	-	-	-	-	-	2 U	2 U
Indeno(1,2,3-cd)pyrene	NA	0.98 U	0.98 U	0.99 U	0.95 U	1 U	1 U	0.99 U	0.99 U	0.98 U
Isophorone	NA	-	-	-	-	-	-	-	2 U	2 U
Naphthalene	0.5	**0.98 U**	**0.98 U**	**0.99 U**	**0.95 U**	0.36 J	**1 U**	**0.99 U**	**0.99 U**	**0.98 U**
Nitrobenzene	NA	-	-	-	-	-	-	-	2 U	2 U
N-Nitrosodimethylamine	NA	-	-	-	-	-	-	-	2 U	2 U
N-Nitrosodi-n-propylamine	NA	-	-	-	-	-	-	-	2 U	2 U
N-Nitrosodiphenylamine	NA	-	-	-	-	-	-	-	5 U	4.9 U
Pentachlorophenol	1	-	-	-	-	-	-	-	**4 U**	**3.9 U**
Phenanthrene	NA	0.98 U	0.98 U	0.99 U	0.95 U	2.2	1 U	0.54 J	0.41 J	0.98 U
Phenol	NA	-	-	-	-	-	-	-	2 U	2 U
Pyrene	NA	0.98 U	0.98 U	0.99 U	0.95 U	0.57 J	1 U	0.99 U	0.99 U	0.98 U
Pyridine	NA	-	-	-	-	-	-	-	2 U	2 U
Total Petroleum Hydrocarbons (ug/L)										
Total Petroleum Hydrocarbons (C10-C28) DRO	NA	-	-	-	-	-	-	-	83 U	83 UJ
Total Petroleum Hydrocarbons (C6-C10) GRO	NA	-	-	-	-	-	-	-	200 U	200 U

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Inorganic Compounds (ug/L)										
Phosphorus, Dissolved	NA	-	-	-	-	-	-	-	-	-
Aluminum, Total	NA	29100	38600	303	12000	160000	1940000	110000	200 U	1400
Antimony, Total	NA	30 U	30 U	6 U	30 U	60 U	300 U	60 U	6 U	6 U
Arsenic, Total	10	**22**	**29.5**	3 U	**15 U**	**140**	**1260**	**148**	3 U	3 U
Barium, Total	2000	1000 U	1000 U	200 U	1000 U	2000 U	**10000 U**	1000 U	200 U	200 U
Beryllium, Total	4	**5 U**	**5 U**	1 U	**5 U**	**10 U**	**85**	**5 U**	1 U	1 U
Cadmium, Total	5	**15 U**	**15 U**	3 U	**15 U**	**30 U**	**150 U**	**15 U**	3 U	3 U
Calcium, Total	NA	33300	31300	18600	25000 U	50000 U	353000	36400	18000	21300
Chromium, Total	100	50 U	63.5	10 U	50 U	**289**	**4580**	**186**	10 U	10 U
Cobalt, Total	NA	250 U	250 U	50 U	250 U	500 U	2500 U	250 U	50 U	50 U
Copper, Total	1300	65.5	87	10 U	50 U	368	**6360**	261	10 U	10 U
Iron, Total	NA	43400 J	59200 J	571	11300	208000	3650000	213000	224	2140
Lead, Total	15	**16.5**	**19.5**	3 U	**18**	**160**	**1500 U**	**90.5**	3 U	3 U
Magnesium, Total	NA	25000 U	25000 U	5000 U	25000 U	50000 U	843000	42400	5000 U	5000 U
Manganese, Total	300	**832 J**	**1140 J**	85.7	**364**	**6570**	**91500**	**6500**	210	105
Mercury, Total	NA	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	1.2 U	0.2 U	0.2 U	0.2 U
Nickel, Total	100	50 U	59	10 U	50 U	**293**	**3220**	**261**	10 U	10 U
Potassium, Total	NA	50000 U	50000 U	10000 U	50000 U	133000	500000 U	50000 U	10000 U	10000 U
Selenium, Total	50	50 U	50 U	10 U	50 U	**100 U**	**500 U**	50 U	10 U	10 U
Silver, Total	NA	50 U	50 U	10 U	50 U	100 U	500 U	50 U	10 U	10 U
Sodium, Total	NA	50000 U	50000 U	128000	50000 U	229000	500000 U	50000 U	107000	51000
Thallium, Total	2	**50 U**	**50 U**	**10 U**	**50 U**	**100 U**	**500 U**	**50 U**	**10 U**	**10 U**
Vanadium, Total	NA	250 U	250 U	50 U	250 U	500 U	4320	250 U	50 U	50 U
Zinc, Total	NA	117 J	153 J	20 U	100 U	523	6740	449	20 U	20 UJ
PCBs (ug/L)										
Aroclor-1016 (PCB-1016)	NA	-	-	-	-	-	-	-	0.25 U	0.33 UJ
Aroclor-1221 (PCB-1221)	NA	-	-	-	-	-	-	-	0.25 U	0.33 UJ
Aroclor-1232 (PCB-1232)	NA	-	-	-	-	-	-	-	0.25 U	0.33 UJ
Aroclor-1242 (PCB-1242)	NA	-	-	-	-	-	-	-	0.25 U	0.33 UJ
Aroclor-1248 (PCB-1248)	NA	-	-	-	-	-	-	-	0.25 U	0.33 UJ
Aroclor-1254 (PCB-1254)	NA	-	-	-	-	-	-	-	0.25 U	0.33 UJ
Aroclor-1260 (PCB-1260)	NA	-	-	-	-	-	-	-	0.25 U	0.33 UJ
Aroclor-1262 (PCB-1262)	NA	-	-	-	-	-	-	-	0.25 U	0.33 UJ
Aroclor-1268 (PCB-1268)	NA	-	-	-	-	-	-	-	0.25 U	0.33 UJ
SUM of PCBs		-	-	-	-	-	-	-	ND	ND
Dioxins/Furans (ug/L)										
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	NA	-	-	-	-	-	-	-	-	-
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	NA	-	-	-	-	-	-	-	-	-
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	NA	-	-	-	-	-	-	-	-	-
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD)	NA	-	-	-	-	-	-	-	-	-
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	NA	-	-	-	-	-	-	-	-	-
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	NA	-	-	-	-	-	-	-	-	-
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	NA	-	-	-	-	-	-	-	-	-
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	NA	-	-	-	-	-	-	-	-	-
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	NA	-	-	-	-	-	-	-	-	-
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	NA	-	-	-	-	-	-	-	-	-
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	NA	-	-	-	-	-	-	-	-	-
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	NA	-	-	-	-	-	-	-	-	-
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	NA	-	-	-	-	-	-	-	-	-
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	NA	-	-	-	-	-	-	-	-	-
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	NA	-	-	-	-	-	-	-	-	-
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	NA	-	-	-	-	-	-	-	-	-
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	3.00E-05	-	-	-	-	-	-	-	-	-
Total Heptachlorodibenzofuran (HpCDF)	NA	-	-	-	-	-	-	-	-	-
Total Heptachlorodibenzo-p-dioxin (HpCDD)	NA	-	-	-	-	-	-	-	-	-
Total Hexachlorodibenzofuran (HxCDF)	NA	-	-	-	-	-	-	-	-	-
Total Hexachlorodibenzo-p-dioxin (HxCDD), Mixture	NA	-	-	-	-	-	-	-	-	-
Total Pentachlorodibenzofuran (PeCDF)	NA	-	-	-	-	-	-	-	-	-
Total Pentachlorodibenzo-p-dioxin (PeCDD)	NA	-	-	-	-	-	-	-	-	-
Total Tetrachlorodibenzofuran (TCDF)	NA	-	-	-	-	-	-	-	-	-
Total Tetrachlorodibenzo-p-dioxin (TCDD)	NA	-	-	-	-	-	-	-	-	-
Field Parameters										
Temperature (Deg C)	NA	-	-	-	-	-	-	-	-	-
Conductivity, Field (mS/cm)	NA	-	-	-	-	-	-	-	-	-
ORP, Field (mv)	NA	-	-	-	-	-	-	-	-	-
Turbidity, Field (NTU)	NA	-	-	-	-	-	-	-	-	-
pH, Field (pH units)	NA	-	-	-	-	-	-	-	-	-
Dissolved Oxygen, Field (ug/L)	NA	-	-	-	-	-	-	-	-	-
Herbicides (ug/L)										
2,4,5-T	70	-	-	-	-	-	-	-	0.083 U	0.083 UJ
2,4,5-TP (Silvex)	50	-	-	-	-	-	-	-	0.083 U	0.083 UJ
2,4-Dichlorophenoxyacetic acid (2,4-D)	70	-	-	-	-	-	-	-	0.42 U	0.42 UJ
Dalapon	200	-	-	-	-	-	-	-	0.083 U	0.083 UJ
Dichloroprop	140	-	-	-	-	-	-	-	0.42 U	0.42 UJ
Dinoseb	7	-	-	-	-	-	-	-	0.42 U	0.42 UJ

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Pesticides (ug/L)										
4,4'-DDD	NA	-	-	-	-	-	-	-	0.0067 U	0.0067 UJ
4,4'-DDE	NA	-	-	-	-	-	-	-	0.0067 U	0.0067 UJ
4,4'-DDT	NA	-	-	-	-	-	-	-	0.0067 U	0.0067 UJ
Aldrin	0.1	-	-	-	-	-	-	-	0.0067 U	0.0067 UJ
alpha-BHC	NA	-	-	-	-	-	-	-	0.0067 U	0.0067 UJ
alpha-Chlordane	NA	-	-	-	-	-	-	-	0.0067 U	0.0067 UJ
beta-BHC	NA	-	-	-	-	-	-	-	0.0067 U	0.0067 UJ
delta-BHC	NA	-	-	-	-	-	-	-	0.0067 U	0.0067 UJ
Dieldrin	0.02	-	-	-	-	-	-	-	0.0067 U	0.0067 UJ
Endosulfan I	NA	-	-	-	-	-	-	-	0.0067 U	0.0067 UJ
Endosulfan II	NA	-	-	-	-	-	-	-	0.0067 U	0.0067 UJ
Endosulfan sulfate	NA	-	-	-	-	-	-	-	0.0067 U	0.0067 UJ
Endrin	2	-	-	-	-	-	-	-	0.0067 U	0.0067 UJ
Endrin aldehyde	NA	-	-	-	-	-	-	-	0.0067 U	0.0067 UJ
Endrin ketone	NA	-	-	-	-	-	-	-	0.0067 U	0.0067 UJ
gamma-BHC (Lindane)	0.2	-	-	-	-	-	-	-	0.0067 U	0.0067 UJ
gamma-Chlordane	NA	-	-	-	-	-	-	-	0.0067 U	0.0067 UJ
Heptachlor	0.4	-	-	-	-	-	-	-	0.0067 U	0.0067 UJ
Heptachlor epoxide	0.2	-	-	-	-	-	-	-	0.0067 U	0.0067 UJ
Methoxychlor	40	-	-	-	-	-	-	-	0.013 U	0.013 UJ
Toxaphene	3	-	-	-	-	-	-	-	0.17 U	0.17 UJ
PFAS (ug/L)										
Fluorotelomer sulfonic acid (4:2 FTSA)	NA	-	-	-	-	-	-	-	-	-
Fluorotelomer sulfonic acid (6:2 FTSA)	NA	-	-	-	-	-	-	-	-	-
Fluorotelomer sulfonic acid (8:2 FTSA)	NA	-	-	-	-	-	-	-	-	-
N-ethyl perfluorooctane sulfonamidoacetic acid (N-EtFOSAA)	NA	-	-	-	-	-	-	-	-	-
N-methyl perfluorooctane sulfonamidoacetic acid (N-MeFOSAA)	NA	-	-	-	-	-	-	-	-	-
Perfluorobutanesulfonic Acid (PFBS)	NA	-	-	-	-	-	-	-	-	-
Perfluorobutanoic Acid (PFBA)	NA	-	-	-	-	-	-	-	-	-
Perfluorodecane sulfonic Acid (PFDS)	NA	-	-	-	-	-	-	-	-	-
Perfluorodecanoic acid (PFDA)	NA	-	-	-	-	-	-	-	-	-
Perfluorododecanoic acid (PFDoDA)	NA	-	-	-	-	-	-	-	-	-
Perfluoroheptane sulfonic acid (PFHpS)	NA	-	-	-	-	-	-	-	-	-
Perfluoroheptanoic acid (PFHpA)	0.02	-	-	-	-	-	-	-	-	-
Perfluorohexanesulfonic acid (PFHxS)	0.02	-	-	-	-	-	-	-	-	-
Perfluorohexanoic acid (PFHxA)	NA	-	-	-	-	-	-	-	-	-
Perfluorononane sulfonic acid (PFNS)	NA	-	-	-	-	-	-	-	-	-
Perfluorononanoic Acid (PFNA)	0.02	-	-	-	-	-	-	-	-	-
Perfluorooctane sulfonamide (FOSA)	NA	-	-	-	-	-	-	-	-	-
Perfluorooctanesulfonic acid (PFOS)	0.02	-	-	-	-	-	-	-	-	-
Perfluorooctanoic Acid (PFOA)	0.02	-	-	-	-	-	-	-	-	-
Perfluoropentane sulfonic acid (PFPeS)	NA	-	-	-	-	-	-	-	-	-
Perfluoropentanoic Acid (PFPeA)	NA	-	-	-	-	-	-	-	-	-
Perfluorotetradecanoic acid (PFTeDA)	NA	-	-	-	-	-	-	-	-	-
Perfluorotridecanoic acid (PFTrDA)	NA	-	-	-	-	-	-	-	-	-
Perfluoroundecanoic acid (PFUnA)	NA	-	-	-	-	-	-	-	-	-
SUM of PFAS (ND = 0)	0.02	-	-	-	-	-	-	-	-	-
SUM of PFAS (ND = 1/2 RL)	0.02	-	-	-	-	-	-	-	-	-

ABBREVIATIONS AND NOTES:
-: Not Analyzed
J: valued is estimated
J+: valued is estimated with a potential high bias
mS/cm: milliSiemen per centimeter
mv: millivolt
NA: Not Applicable
NTU: Nephelometric Turbidiy Units
RSL: Risk-Based Screening Levels
U: Not detected, value is the laboratory reporting limit
ug/L: microgram per liter
USEPA: United States Environmental Protection Agency
VT ANR: Vermont Agency of Natural Resources

- Volatile and Semi-Volatile analytes detected in at least one sample are reported herein.
  For a complete list of analytes see the laboratory data sheets.
- Bold values indicate an exceedance of the VT ANR Proposed 2019 Groundwater
  Enforcement Standard.

TABLE 7-1
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VERMONT YANKEE NUCLEAR POWER STATION

AOC No.	VANR AOC No.	PCS No.	AREAS OF CONCERN (AOCs)[1]	AOC LOCATION/DESCRIPTION	2001 PHASE I & II ESA STATUS[2]	2001 PHASE I & II RECOGNIZED ENVIRONMENTAL CONDITION[2]	2014 HSA AOC STATUS[3]	OTHER INVESTIGATIONS	2017 PHASE I ESA[4]	SUMMARY OF INVESTIGATIONS	FINDINGS/STATUS	ADDITIONAL INVESTIGATION REQUIRED	2019 SITE INVESTIGATION ACTIVITIES	FINDINGS	RECOMMENDATIONS
345 kV Switchyard															
1		1	345 kV Switchyard	345 kV Switchyard	Perimeter curtain drains to outfall north of the North Storm Water System Outfall	Yes, Phase II sampling performed	All equipment is the switchyard is now owned by VELCO, while the land is owned by Entergy. Sorbent pads are visible beneath a transformer in the switchyard.	In 2009, TRC performed a Phase I of the parcel on behalf of VELCO. Phase II activities were performed in March 2009.		A wastewater sample was collected from the switchyard curtain drainage system during the 2001 Phase II and analyzed for PCBs and TPH. In 2009, samples were collected from the 5 dry wells located within the switchyard.	Results of the 2001 Phase II wastewater sample did not contain concentrations of TPH or PCBs above MDLs. Results of the 2009 Phase II samples from the dry wells contained concentrations of TPH exceeding the VT Soil Reuse Criteria of 1,000 mg/kg. These dry wells were identified as RECs.	Yes. Documented releases and impacts.	Access to the switchyard was not provided by VELCO at the time of this investigation. No all proposed explorations were completed.		No further action is recommended at the areas that were accessible, however; if access to the substation can be arranged with VELCO, we recommend the collected of SS0101 and SS0102 to address PCS 1-1
1		1-1	Auto Transformer	On concrete pad within the 345 kV Switchyard with 17,200-gallon capacity of non-PCB oil	No staining observed.	Yes, Phase II sampling performed	No staining observed.			As part of the 2001 Phase II, a composite soil sample was collected adjacent to the transformer and analyzed for PCBs.	PCBs were not detected above MDLs in the soil sample.	Yes, to determine if any releases have occurred.	No access		See above
1		1-3	Spare Main Transformer	East of the 345 kV Switchyard; it had a 26,500-gallon capacity of non-PCB oil.	Weathered staining observed in the vicinity of the transformer. No active leak observed. Drains to separator MH-A	Yes, Phase II sampling performed	Transformer oil leaking on to the ground. This transformer was removed from the site in 2007.			As part of the 2001 Phase II, a grab soil sample was collected adjacent to the Main Transformer and analyzed for PCBs.	The PCB-1260 was detected at 200 ug/kg in soil	Yes, additional samples will be required to delineate the PCB impacts to soil.	Direct push boring DP0101 was advanced on adjacent to the former transformer pad to collect surface and deeper soil samples.	VOCs, PAHs, TPH and PCBs were not detected above laboratory reporting limits. No evidence of a release.	No further action is recommended.
115 kV Switchyard															
2		2	115 kV Switchyard	115 kV Switchyard	Perimeter curtain drain drains to two outfalls discharging to the CT River north of the 345 kV switchyard outfall. Two half-buried empty rusted drums were observed on the embankment of the river. The drums were removed in May 2001.	Yes, Phase II sampling performed	All equipment in the switchyard is now owned by VELCO, while the land is owned by Entergy. No staining observed.			Four soil samples were collected from the 115 kV Switchyard outfall of the curtain drainage system as part of the 2001 Phase II. Samples were analyzed for TPH and PCBs.	TPH was detected in all four soil samples at concentrations ranging from 87 mg/kg to 250 mg/kg. PCBs were not detected above MDL in any of the samples.	Yes. Documented releases and impacts.	Although explorations were planned for this AOC, access to the substations was not provided by VELCO at the time of the investigation.		If access is authorized, samples should be collected to verify environmental conditions. If access is not granted, collect groundwater samples immediately down gradient of the PSCs to confirm no significant environmental impacts from historic operations.
2		2-2	Keene Line Breaker	On concrete pad within the 115 kV Switchyard	No soil staining observed.		No staining observed.				No evidence of a release	Yes, to determine if any releases have occurred.	See above		See above
2		2-3	Bus Line Breaker	On concrete pad within the 115 kV Switchyard	No soil staining observed.		No staining observed.				No evidence of a release	Yes, to determine if any releases have occurred.	See above		See above
2		2-4	Coolidge Line Breaker	On concrete pad within the 115 kV Switchyard	No soil staining observed.		No staining observed.				No evidence of a release	Yes, to determine if any releases have occurred.	See above		See above
N/A	13	N/A	VELCO Substation	VELCO Substation	Not constructed at time of Phase I/II		All equipment in the switchyard is now owned by VELCO, while the land is owned by Entergy. No staining observed.					No. Active substation to remain. Will be address with downgradient explorations performed at other AOCs			No action recommended.
Former South Warehouse															
3		3	South Warehouse	Former Flammable Materials Cage	Area properly labeled and in good condition; No leaks or damaged containers observed		No staining or damaged containers observed.					Yes, to determine current conditions and if any releases have occurred.			Screening of shallow soil beneath the concrete floor slab is recommended following building and slab removal.
3		3-1, 3-2, 3-6, and 3-7	South Warehouse	Chemicals and batteries were stored and used within the South Warehouse	Area properly labeled and in good condition; No leaks or damaged containers observed		Vehicle maintenance was performed at the site of the South Warehouse during plant construction. Petroleum products related to that activity may be present in the soil or groundwater. Approximately 2,000 gallons of virgin and waste oils are stored in steel 55-gallon drums within a containment berm at the east end of the building. Drums are in good condition, with no evidence of spills or leaks. Lead acid batteries are charged and stored in a locked battery work cage in southwest corner of the building.					Yes, need to determine current conditions.			See above
3		3-3	1,000-gallon Gasoline UST	UST was northeast of the South Warehouse Building	Installed in 1997, UST was used to store fuel for vehicles. It passed an April 2001 leak test and was routinely inspected by the ANR. It also had a Veeder Root interstitial monitoring system. Weekly leak testing was performed.	Yes, Phase II explorations performed	The UST was double-walled and had a Veeder-Root automatic monitoring system. It was converted from gasoline to diesel in September 2001. VT UST Program ID No. 806.			Two soil samples and one GW sample were collected from the Gasoline/Diesel UST vicinity (GD-B1 & GD-B2) during the 2001 Phase II. Samples were analyzed for VOCs and TPH.	Concentrations of VOCs and TPH were not detected above MDLs in soil. In GW, the VOC 1,2,4-Trimethylbenzene was detected at 1.4 ug/L. No other VOCs were detected. TPH was not detected.	Yes, gasoline constituent detected. Determine current conditions.	Direct push boring DP0301 was advanced at this PCS. Surface soil and a deeper soil sample (18 to 20 ft bgs) were analyzed for COCs.	Trace concentrations of benzene and acetone (common laboratory contaminant) were detected as well as diesel range organics (DRO) and gasoline range organics (GRO) in the sample collected from 18 to 20 ft bgs.	This UST has been removed. Based on the trace concentrations of COCs, no further investigation is recommended.
3		3-4	550-gallon Diesel UST	UST was northeast of the South Warehouse Building	Installed in 1997, UST was used to store fuel for vehicles. It passed an April 2001 leak test and was routinely inspected by the ANR. It also had a Veeder Root interstitial monitoring system. Weekly leak testing was performed.	Yes, Phase II explorations performed	Tank is double-walled and has a Veeder-Root automatic monitoring system. VT UST Program ID No. 806					Yes, to determine if any releases have occurred.	Direct push boring DP0301 was advanced at this PCS. Surface soil and a deeper soil sample (18 to 20 ft bgs) were analyzed for COCs.	Trace concentrations of benzene and acetone (common laboratory contaminant) were detected as well as diesel range organics (DRO) and gasoline range organics (GRO) in the sample collected from 18 to 20 ft bgs.	This UST has been removed. Based on the trace concentrations of COCs, no further investigation is recommended.

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Former South Warehouse (*continued*)															
3		3-5	1,000-gallon Portable Diesel AST	Double-walled portable AST located north of the northeast corner of the South Warehouse when not in use.	No discussed		Tank appears to be well maintained and in good condition with no visible evidence of a release.		In use at various locations around the plant according to Normandeau in 2017 Phase I			Yes, to determine if any releases have occurred.	Direct push borings DP0303 and DP 0304 were advanced at this PCS. Surface and deeper soil samples were collected and analyzed for COCs.	Several SVOCs/PAHs were in the shallow soil (0-1 ft bgs) samples. Benzo(a)pyrene was reported at a concentration above the RSSV (0.076 mg/kg) in the sampled collected from DP0303 and its duplicate (0.125 and 0.228 mg/kg, respectively).	This PCS has been removed. Further evaluation of surface soil is recommended upon removal of floor slab.
3		3-6 and 16	Former Waste Oil UST	This tank was located in the former CAB, which was replaced by the current CAB.	Former 1,000-gallon UST	Yes, Phase II explorations performed	Drained, cleaned and removed from site. Reportedly no associated contaminated soil.			A soil sample and a groundwater sample was collected in the vicinity of the former UST location during the 2001 Phase II. The soil sample was analyzed for VOCs, TPH, PAHs, PCBs, and total 13 PP metals. The groundwater sample was analyzed for VOCs, TPH, PAHs, PCBs, dissolved 13 PP metals and radiological parameters.	No concentrations of VOCs, TPH, PAHs or PCBs were detected in the soil above MDLs. Metal concentrations were within background ranges. TPH was detected at 0.65 mg/L in the groundwater. No VOCs, PAHs, PCBs or dissolved metals were detected above MDLs in groundwater.	Yes, TPH impacts noted.	Direct push boring DP0302 was drilled at this PCS. Surface and deeper soil samples were collected and submitted for analysis of COCs.	A trace concentration of trichlorofluoromethane and TPH (DRO) were detected in the surface soil. No SVOCs or PCBs were detected above MDLs. Metals were within background or below the RVSS.	No further investigation is recommended for this PCS. Further evaluation of the surface soil will be performed.
Former North Warehouse															
4		4	500-gallon Diesel AST	Double-walled portable AST located under a roof adjacent to the salt shed in the Main Parking Lot.	All ASTs have secondary containment including double-walled construction. No evidence of a release observed.		Tank appears to be well maintained and in good condition with no visible evidence of a release.					No			No further action is recommended.
4		4-2	500-gallon Waste Oil AST	Located in the North Warehouse	All ASTs have secondary containment including double-walled construction. No evidence of a release observed.		Heavy gauge steel tank with secondary containment. Radiologically contaminated waste oil was burned for space heating in the North Warehouse from approx. 1995 to 2011. Unburned particles may have accumulated on the north roof and ground beneath the drip line.	Tank removed in 2016 when the North Warehouse was demolished.			Tank has been removed. Pre and post building demolition investigations were conducted of this area. No evidence of a release was observed. No further action recommended.	No			No further action is recommended.
4		4-3	550-gallon Diesel UST (John Deere Diesel Generator Building)	Located adjacent to the John Deere Diesel Generator Building.	Installed in 1997, UST was used to store fuel for vehicles. It passed an April 2001 leak test and was routinely inspected by the ANR. It also had a Veeder Root interstitial monitoring system. Weekly leak testing was performed.	Yes, Phase II explorations performed	Tank is double-walled and has a Veeder-Root automatic monitoring system. VT UST Program ID No. 806	On 2 November 2016, Haley & Aldrich oversaw the removal of this UST. The UST appeared to be in good condition. Soils were screened using a PID. Confirmatory soil samples were collected from excavation sidewalls and beneath fuel pipes. Samples were analyzed for VOCs and TPH (DRO). No visual evidence of a release was observed.		During the 2001 Phase II, two soil samples were collected from the vicinity of the UST. Samples were analyzed for VOCs and TPH. No VOCs were detected above MDLs. TPH was detected at 34 mg/kg in one of the two samples. No VOCs were detected in the confirmatory soil samples collected during tank removal and closure activities. Low levels of diesel range organics (DRO) <17 mg/kg were reported.	Closed. A UST Closure Report was filed with the UST Program of VANR by Haley & Aldrich on 15 November 2016 on behalf of Entergy.	No. UST removed. Confirmatory samples collected and in compliance.			No further action is recommended.
4		4-4	North Warehouse (RCRA Wastes)	Designated area within North Warehouse for chemical storage	Area properly labeled and in good condition; No leaks or damaged containers observed		Various pieces of radiologically contaminated equipment are stored throughout the building, in addition to spent lead-acid batteries, used ethylene glycol, PCB-containing items (such as fluorescent lamp ballasts and small low-voltage capacitors) and waste computer parts. (2) storage cabinets for flammable materials are located on south wall. Material properly labeled and in good condition. No leaks or damaged containers observed. The North Warehouse is a RCRA permitted hazardous waste storage area.	In November 2016, the North Warehouse was demolished. Building materials, surface and subsurface soils were characterized prior to and following building demolition.		Five surface soil samples and seven subsurface soil samples were collected from within and adjacent to the footprint of the North Warehouse. Samples were analyzed for VOCs, SVOCs, PCBs, total & SPLP metals. Select samples were also analyzed for polychlorinated dibenzodioxins/polychlorinated dibenzofurans, pesticides and herbicides. Three samples of the sediment accumulated in draining pipes from the warehouse floor drains were also collected. These samples were analyzed for VOCs, SVOCs, PCBs, total and SPLP metals.	No analytical results exceeded regulatory criteria. Evidence of releases (i.e. staining, odors) were not observed. Details are provided in the August 2017 "Final North Warehouse Soil Characterization Report, Revision 1" prepared by Haley & Aldrich.	No. No evidence of releases.			No further action is recommended.

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Turbine Building															
5		5-1	12,000-gallon No. 2 Fuel Oil AST	Located in the vicinity of the former 5,000-gallon House Heating Boiler Fuel UST	All ASTs have secondary containment including double-walled construction. No evidence of a release observed.		Double-walled tank installed in 1995 with Veeder-Root automatic monitoring system. Tank and underground piping cathodically protected. No visible indication of leaks or spills.		Reported as active in the 2017 Phase I by Normandeau.			Yes, to determine if any releases have occurred.	This PCS is located in the same area as the former 5,000 gallon UST (PCS 5-2) and associated piping (PCS 5-3). See below for discussion.	Trace concentrations of PAHs and TPH were reported in shallow soil at this PCS that may be related to this PCS however; no staining was observed. See below for additional discussion of soil and groundwater.	Further evaluation of soil impacts will be conducted at the time of tank removal and demolition.
5	1	5-2 and 5-3	Former 5,000-gallon Fuel Oil UST	House Heating Boiler Fuel Oil UST west side of Turbine Building; removed in 1994	TPH and VOCs (BTEX and Chlorinated Solvents PCE and TCE) exceeded the VT PGQS. Free-phase oil was present in 2 of 9 MWs. Groundwater monitoring was in progress and approved by VTDEC (SMS Site No. 99-2617).	Yes, Phase II sampling performed	VTDEC issued a SMAC designation on 16 September 2008 effectively closing the spill although low levels of fuel oil constituents and solvents were still detectable. The 9 MWs associated with this spill were abandoned. The buried fill pipe to the UST runs more than 200 ft. from the fuel oil pump room, under the New Warehouse to the UST. When the UST was removed, the fill pipe failed a pressure test. The fill pipe was blanked off but not removed because of overlying structures. Fuel oil may have leaked to soil and groundwater from the fill pipe in inaccessible areas that were not investigated.	According to the SMAC letter issued by VANR on 16 September 2008, there were several phases of investigation conducted in this area including a 1999 Phase II Environmental Report prepared by McLaren Hart. Several GW monitoring events followed this investigation, conducted on a quarterly, semi-annual and annual basis since 1999.		During the 2001 Phase II, nine groundwater samples were collected from existing MWs in this area. Samples were analyzed for VOCs, TPH, PCBs and radiological parameters.	In 2001, several petroleum related VOCs and chlorinated solvents PCE and TCE were detected in groundwater as well as TPH. No PCBs were detected above MDLs. Groundwater monitoring has been conducted on a regular (quarterly, semi-annual and then annual basis) since 1999. On 16 September 2008, VANR issued a Sites Management Activity Complete (SMAC) designation letter for this area. As part of this SMAC, a Notice to Land Records was recorded on 2 September 2008 to the Vernon Town Offices regarding the residual soil and groundwater contamination in the UST vicinity.	Additional investigation and remediation may be required following Turbine Building demolition. Prior to conducting any subsurface work in this area VNAR must be notified.	Direct push borings DP0501 through DP0504 were drilled in the area of both these PCS's to evaluate impacts to soil and groundwater. Surface and deeper soil samples were collected from each boring. Grab groundwater samples GW0501 through GW0504 were also collected and submitted for analysis of COCs. PFA's were analyzed in groundwater samples GW0502 and GW0504.	In the deeper soil (18-20 ft bgs) at DP0502 several VOCs and PAHs were detected. Naphthalene and benzo(a)pyrene exceeded the RSSV. TPH (DRO/GRO) were also detected at significant concentrations. A petroleum odor, staining and a sheen were noted. Perfluorobutanoic acid (PFBA) were detected in surface soil at DP0502 and DP0504. Several petroleum-related COCs were detected in groundwater. 1,2,4-Trimethylbenzene, 1,3,5-trimethylbenzene, and naphthalene exceeded VT GES in GW0502. PFAs were also detected above GES. No VOCs, PAHs or TPH (DRO/GRO) were detected in GW0503. Low concentrations of chlorinated VOCs were detected in GW0504 and PFAs exceeded GES. Elevated metals concentrations were detected in all four groundwater grab samples (GW0501 through GW0504) collected from this AOC.	Monitoring wells will be installed in this AOC to further evaluated COCs detected in the groundwater. These wells will be added to the Groundwater Monitoring Plan. Impacted soil will be delineated, excavated and disposed of off site during demolition activities in this AOC.
5		5-4	11,000-gallon Lube Oil AST	Located in lube oil pump room of the Turbine Building	All ASTs have secondary containment including double-walled construction. No evidence of a release observed.		Lube oil tank appears to be well maintained and in good condition, with no visible indication of leaks or spills. The pump room also contained drums and containers of virgin turbine lube oil as well as safety cans of waste oil. Containers appeared to be in good condition.		Empty, no longer in use according to 2017 Phase I by Normandeau		Tank was within secondary containment and inside the building. Area will be visually inspected. If staining is observed, concrete chip samples may be collected for characterization.	Yes, to determine if any releases have occurred.			For PCSs located within the building, if a pathway exists (i.e. via floor drains or cracks in slab on grade areas) soils immediately adjacent or below shall be characterized. Sub-floor characterization will be coordinated with the building demolition and may be conducted following floor slab removal.
5		5-5	Two 800-gallon Diesel Generator Day Tanks (ASTs)	Located in the Turbine Building	All ASTs have secondary containment including double-walled construction. No evidence of a release observed.				Empty, no longer in use according to 2017 Phase I by Normandeau		Tanks are in secondary containment and inside the building. Area will be visually inspected. If staining is observed, concrete chip samples may be collected for characterization.	Yes, to determine if any releases have occurred.			See above
5		5-5	Two 275-gallon Diesel Generator Lube Oil ASTs	Located in diesel generator rooms	All ASTs have secondary containment including double-walled construction. No evidence of a release observed.		Tanks appear to be well maintained and in good condition with no visible evidence of a release.		Empty, no longer in use according to 2017 Phase I by Normandeau		Tanks are in secondary containment and inside the building. Area will be visually inspected. If staining is observed, concrete chip samples may be collected for characterization.	Yes, to determine if any releases have occurred.			See above
5		5-6	Turbine Building -West Side	Inside roll-up door in Turbine Building	Area properly labeled and in good condition; No leaks or damaged containers observed		Virgin resin in chemical storage cabinets. Former location of dry cleaning operation.					Yes, evaluation to determine if COCs have been released to the environment. If a pathway exists, soils adjacent to or below shall be characterized. Sub-floor characterization will be coordinated with the building demolition.			See above
5	4	5-6 and 16	Dry Cleaning Operations - Turbine Building	Located in a truck bay of the Turbine Building from approx. 1982 to 1985, dry cleaning was used to clean protective clothing worn in the Radiologically Controlled Area.	Not Discussed		Used to clean protective clothing warn in the RCA from approx. 1982 to 1985.				Low concentrations of chlorinated solvents were detected in groundwater monitored at the site of the leaking 5,000-gallon fuel oil UST outside the Turbine Building truck bay.	Yes, additional samples will be required to delineate solvent impacts			See PCS 5-2 & 5-3. Further evaluation within the building to be conducted in conjunction with demolition.

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Turbine Building (*continued*)															
5		5-7	Turbine Building Machine Shop	Turbine Building	Area properly labeled and in good condition; No leaks or damaged containers observed.		(1) flammable materials storage cabinet, (1) non-flammable materials storage cabinet, (1) parts washer, (1) oily rag storage can, (1) cart containing welding/cutting gas cylinders. No visible leaking or damaged containers.					Yes, evaluation to determine if COCs have been released to environment. If a pathway exists, soils immediately adjacent to or below shall be characterized. Sub-floor characterization will be coordinated with the building demolition.			Evaluation to determine if COCs have been released to environmental media. If a pathway exists, soils immediately adjacent to or below shall be characterized. Sub-floor characterization will be coordinated with the building demolition.
5	3	5-8	Turbine Building - Chemistry Laboratory	Within the Turbine Building	Area was noted to be properly labeled and in good condition, with no leaks or damaged containers observed. The leaking drain pipe discovered in 1991 was not discussed.		Drain pipe from chemistry lab sink was discovered to be leaking under the floor slab in 1991. Pipe was abandoned in place. Limited subsurface investigation showed radionuclides to be present in soil beneath the floor but no non-rad contaminants. 10 CFR 20.302 permit application made to NRC in 1991 to leave low levels of radionuclides in place. Application approved by NRC March 7, 1996 and published "Finding of No Significant Impact" in Federal Register (61 CFR 8984).					Yes, evaluation to determine if COCs have been released to environment. If a pathway exists, soils immediately adjacent to or below shall be characterized. Sub-floor characterization will be coordinated with the building demolition.			Evaluation to determine if COCs have been released to environmental media. If a pathway exists, soils immediately adjacent to or below shall be characterized. Sub-floor characterization will be coordinated with the building demolition.
5		5-9	T-6-1A Transformer	Located in Turbine Building, in the vicinity of the sample sink on elevation 248 ft. It has 215-gallon capacity of non-PCB oil.	Within secondary containment berm, no staining observed.		Surrounded by concrete containment dike. No staining observed.				No evidence of a release	Yes, visual inspection. If staining is observed, concrete chip samples may be collected for characterization.			Conduct visual inspection once out of service. If evidence of a release is observed, concrete chip samples may be collected for characterization.
5		5-9	T-7-1A System Transformer	Located in Turbine Building, near make up demineralizer system at elevation 248 ft. It has 215-gallon capacity of non-PCB oil.	Within secondary containment berm, no staining observed.		Surrounded by concrete containment dike. No staining observed.				No evidence of a release	Yes, visual inspection. If staining is observed, concrete chip samples may be collected for characterization.			Conduct visual inspection once out of service. If evidence of a release is observed, concrete chip samples may be collected for characterization.
5		5-9	T-8-1A Transformer	Located in Control Room. It has 215-gallon capacity of non-PCB oil.	Within secondary containment berm, no staining observed.		Surrounded by concrete containment dike. No staining observed.				No evidence of a release	Yes, visual inspection. If staining is observed, concrete chip samples may be collected for characterization.			Conduct visual inspection once out of service. If evidence of a release is observed, concrete chip samples may be collected for characterization.
5		5-9	T-9-1A Transformer	Located in the switchgear room of the Control Building. It has 215-gallon capacity of non-PCB oil.	Within secondary containment berm, no staining observed.		Surrounded by concrete containment dike. No staining observed.				No evidence of a release	Yes, visual inspection. If staining is observed, concrete chip samples may be collected for characterization.			Conduct visual inspection once out of service. If evidence of a release is observed, concrete chip samples may be collected for characterization.
5		5-9	T-10-1A Transformer	Located in Turbine Building at elevation 232 ft, near the air dryers. It has 367-gallon capacity of non-PCB oil.	Within secondary containment berm, no staining observed.		Surrounded by concrete containment dike. No staining observed.				No evidence of a release	Yes, visual inspection. If staining is observed, concrete chip samples may be collected for characterization.			Conduct visual inspection once out of service. If evidence of a release is observed, concrete chip samples may be collected for characterization.
5		5-9	Generator Neutral Grounding Transformer, near isophase bus area	Located in Turbine Building, near isophase bus area. It has 44-gallon capacity of non-PCB oil.	Within secondary containment berm, no staining observed.		Normally not energized. Low risk of fire. Access to this transformer is poor and as of 1997 it still contained PCB oil; however, OP-2016 Rev. 33 lists it as containing "non PCB oil".				No evidence of a release however; prior to removal and disposal, oil should be tested to determine if it's a PCB oil or non-PCB oil transformer.	Yes, visual inspection. If staining is observed, concrete chip samples may be collected for characterization. Transformer oil will require testing.			Conduct visual inspection once out of service. If evidence of a release is observed, concrete chip samples may be collected for characterization.
5		N/A	New Warehouse	New Warehouse	Not Discussed		(7) flammable materials cabinets and (2) acid cabinets. Ventilation for each cabinet hard-piped to outside of building. No visible leaking or damaged containers.			Acid cabinet removed in 2017.		Yes. Evaluation to determine if COCs have been released to environmental media. If a pathway exists, soils immediately adjacent to or below shall be characterized. Sub-floor characterization will be coordinated with the building demolition.			Evaluation to determine if COCs have been released to environmental media. If a pathway exists, soils immediately adjacent to or below shall be characterized. Sub-floor characterization will be coordinated with the building demolition.
5		N/A	Instrumentation & Control Chemicals Cabinet	Administration Building 3rd Floor	Area properly labeled and in good condition; No leaks or damaged containers observed		(1) flammable materials storage cabinet, No visible leaking or damaged containers.				Cabinet is located on 3rd floor of building. Any releases from chemicals in storage would not impact site soil or groundwater	No			No action recommended.

TABLE 7-1
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AOC No.	VANR AOC No.	PCS No.	AREAS OF CONCERN (AOCs)[1]	AOC LOCATION/DESCRIPTION	2001 PHASE I & II ESA STATUS[2]	2001 PHASE I & II RECOGNIZED ENVIRONMENTAL CONDITION[2]	2014 HSA AOC STATUS[3]	OTHER INVESTIGATIONS	2017 PHASE I ESA[4]	SUMMARY OF INVESTIGATIONS	FINDINGS/STATUS	ADDITIONAL INVESTIGATION REQUIRED	2019 SITE INVESTIGATION ACTIVITIES	FINDINGS	RECOMMENDATIONS
Radiological Waste Building															
6		6-1 and 16	Materials Storage & Parts Washer in Rad Waste Building	Operated from approx. 1982 to 1985 and used to clean tools.	Not Discussed		Unit reportedly used Freon, but may have used other synthetic organic solvents.				Area will be visually inspected. If staining is observed, concrete chip samples will be collected.	Yes	Soil from direct push borings DP0601 and DP0602 was collected as well as groundwater from downgradient wells and grab samples GW0601 and GW0602.	No significant chemical impacts were observed in soils and/or groundwater samples collected from this AOC.	Sub-floor characterization will be coordinated with the building demolition and may be conducted following floor slab removal.
6		6-2	Radiological Waste Building and Tanks	Radiological Waste Building and Tanks	Not Discussed		Not Discussed					Yes, to determine current conditions and if any non-radiological releases have occurred.	Soil from direct push borings DP0601 and DP0602 was collected as well as groundwater from downgradient wells and grab samples GW0601 and GW0602.	No significant chemical impacts were observed in soils and/or groundwater samples collected from this AOC.	No further investigation is recommended for this PCS.
Fuel Oil Storage Tanks															
7		7-1	3,000-gallon No. 2 Fuel Oil UST	Located west of the PSB	Installed in 1998, used to store heating fuel for PSB. Passed June 2001 leak test.		Tank is double-walled and has a Veeder-Root automatic monitoring system. Weekly leak tests performed. Annual inspections performed by Veeder Root vendor. Not regulated by VTANR.		Reported as active in the 2017 Phase I by Normandeau.			Yes, explorations will be conducted to confirm no releases have occurred.	Surface and deeper soil samples were collected from direct push boring locations DP0701 and DP0702 drilled at this PCS.	A trace concentration of benzene was detected in the deeper soil sample (8-10 ft bgs) collected from DP0702. No PAHs, TPH, PCBs or other VOCs were detected above reporting limits for this PCS.	This UST is still active. Upon removal, the tank and surrounding soil will be evaluated for evidence of a leak/release. Sampling and UST close out will be performed in accordance with VT regulations.
7		7-2	75,000-gallon Main Fuel Oil AST	AST has secondary containment	No staining observed.		Tank was drained, cleaned and lined in 2013. Secondary containment dry with no staining observed. Rainwater accumulated in the secondary containment is sampled and analyzed for radiological constituents and oil prior to draining to the river.		Reported as active in the 2017 Phase I by Normandeau.			Yes, to determine if any releases have occurred.	Soil samples were collected from the surface and near the water table in DP0703 and DP0704 as well as the surface (SS0701) in an area inaccessible to the drill rig.	Evidence of a release was observed. Several VOCs were detected at concentrations below the RVSS in the deeper soil samples collected at and just above the groundwater table (16 to 18 and 21 to 23 ft bgs) in DP0704. Total petroleum hydrocarbon (DRO) were also detected in the sample collected from 16 to 18 ft bgs. A diesel like odor and PID reading (49.7 ppm) were also noted on the boring log. Trace concentrations of several PAHs as well as TPH (GRO) were detected in the surface soil sample SS0701.	Further delineation of this PCS is recommended once the tank is removed from service and surrounding structures are demolished, allowing for access.
7		7-3	9,600-gallon Diesel AST	South of New Warehouse, used for Station Black-Out Generator	Not in place at time of Phase I/II		Generator and double-walled steel AST at base of generator installed in 2012. Tank appears to be well maintained and in a good condition with no visible evidence of a release.		Reported as active in the 2017 Phase I by Normandeau.			Yes, to determine if any releases have occurred.	Two surface soil samples (SS0702 and SS0703) were collected and one direct push boring (DP0705) was drilled at this PCS.	Several PAHs were detected at concentrations below the RVSS. Additionally, TPH(DRO) was detected in the surface soil collected from SS0703. No VOCs were detected above laboratory reporting limits for this PCS.	The installation and sampling of a monitoring well directly downgradient of this PCS to determine if groundwater quality has been impacted.
7		7-4	1,000-gallon Gasoline AST	Southeast of Gate No. 1	Not in place at time of Phase I/II		Tank appears to be well maintained and in good condition, with no visible indication of leaks or spills		Reported as active in the 2017 Phase I by Normandeau.			Yes, to determine if any releases have occurred.	Three direct push borings (DP0706 through DP0708) were advanced it the area of the 1,000-gallon gasoline AST and associate fill line and dispenser for soil sample collection and analysis.	Other than trace concentrations of acetone, no other VOCs, PAHs, or TPH were detected above laboratory reporting limits in the soil collected from DP0706, DP0707 and DP0708	
7		7-5	500-gallon Waste Oil AST	Located in the Containment Access Building (CAB)	All ASTs have secondary containment including double-walled construction. No evidence of a release observed.		Prior to 2006, waste oil was burned for space heating. It was discontinued when the old CAB was demolished and replaced with the new CAB.	Tank was removed in 2006 when the old CAB was demolished			Tank was in secondary containment and inside the building. Area will be visually inspected. If staining is observed, concrete chip samples may be collected for characterization.	Yes, to determine if any releases have occurred.	A surface soil sample (SS0704) was collected within the footprint of the former 500-gallon waste oil AST at the Former Containment Access Building for analysis.	VOCs, PAHs, TPH and PCBs were not detected above laboratory detection limits. No evidence of a release observed.	No further action is recommended.
7		7-6	275-gallon fuel oil AST	Located in Shipping & Receiving Building	Building was not constructed in June 2001		Tank used for space heating. Has secondary containment and no visible staining observed.		Active according to the 2017 Phase I by Normandeau			Yes, to determine if any releases have occurred.	SS0705 was collected from surficial soils near the fill pipe for the 275-gallon fuel oil AST at Shipping and Receiving.	Surface soil in an area, approximately 9 sq. ft. in size, appeared to be stained just west of the fill pipe for the 275-gallon fuel oil AST. SS0705 was collected from this area. Several VOCs were detected in both samples with concentration of ethylbenzene and naphthalene exceeding the RVSS. Several PAHs were also reported at concentrations below the RVSS and significant concentrations of TPH (GRO and DRO ranges) were also reported.	Excavation and offsite disposal of impacted soils.

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Transformers (Outside Various Buildings)															
8		8-1	Vernon Hydro Tie Transformer	Transformer is located with concrete containment northwest of the west cooling tower. It has 788-gallon capacity of non-PCB oil.	No staining observed.	Yes, Phase II sampling performed	No staining observed.			As part of the 2001 Phase II, a composite soil sample was collected adjacent to the transformer and analyzed for PCBs.	PCBs were not detected above MDLs in the soil sample.	Yes, to determine if any releases have occurred.	Surface soil sample SS0801 and a field duplicate were collected at this PCS.	PCBs were not detected. Trace concentrations of PAHs were detected in the field duplicate sample from PCS 8-1 however; not in the original sample.	
8		8-2	Construction Office Building Transformer	On a concrete pad, north of COB with 210-gallon capacity of non-PCB oil	No staining observed.		Concrete pad has a 2.5-inch high berm formed of masonry bricks around the perimeter of the pad.				No reported spills or leaks.	Yes, to determine if any releases have occurred.	Surface soil sample SS0802 was collected at this PCS.	Trace concentrations of PAHs were detected. No PCBs were detected.	No further action is recommended.
8		8-3	Administration Building Transformer	East of Administration Building. Transformer has 375-gallon capacity of non-PCB oil	Not Discussed		Situated on a concrete pad in containment basin filled with crushed stone. No staining observed.				No evidence of a release	Yes, to determine if any releases have occurred.	Surface soil sample SS0803 was collected at this PCS.	Trace concentrations of PAHs were detected. No PCBs were detected.	No further action is recommended.
8		8-4	Plant Support Building (PSB) Transformer	On a concrete pad west of PSB with a capacity of 248-gallon capacity non-PCB oil.	No soil staining observed.		No staining observed.				No evidence of a release	Yes, to determine if any releases have occurred.	Surface soil sample SS0804 was collected at this PCS.	No PAHs or PCBs were detected above reporting limits at this location.	No further action is recommended.
8	14	8-5	Cooling Towers East Transformer	Located in concrete containment north of east towers with a capacity of 545-gallons of non-PCB oil	No soil staining observed.	Yes, Phase II sampling performed	A sample of transformer oil detected PCBs at 249 ppm in January 2005. The transformer is considered "PCB contaminated". Source of the contamination is unknown but may be residual remaining after change out of oil previously containing PCBs. No staining observed.			As part of the 2001 Phase II, a composite soil sample was collected adjacent to the transformer and analyzed for PCBs.	PCBs were not detected above MDLs in the soil sample.	Yes, to determine if any releases have occurred.	Surface soil sample SS0805 was collected at this PCS.	Trace concentrations of PAHs and TPH (DRO) were detected but were in exceedance of the benzo(a)pyrene TEQ. No PCBs were detected.	Additional evaluation of the TEQ with respect to site wide soils will be evaluated.
8	14	8-6	Cooling Towers West Transformer	In concrete containment north of west towers. Transformer has capacity of 545-gallons of non-PCB oil	No soil staining observed.	Yes, Phase II sampling performed	A sample of transformer oil detected PCBs at 246 ppm in January 2005. The transformer is considered "PCB contaminated". Source of the contamination is unknown but may be residual remaining after change out of oil previously containing PCBs. No staining observed.			As part of the 2001 Phase II, a composite soil sample was collected adjacent to the transformer and analyzed for PCBs.	PCBs were not detected above MDLs in the soil sample.	Yes, to determine if any releases have occurred.	Surface soil sample SS0806 was collected at this PCS.	No PAHs or PCBs were detected above reporting limits at this location.	No further action is recommended.
8	2	8-7	Main Transformer	West side of Turbine Building with 27,400-gallon capacity of non-PCB oil	Within a concrete containment vault that drains to oil/water separator MH-A; PCBs in oil in MH-A; PCBs in storm water to 41 ppm; soil staining in vicinity of the transformer. Active leak indicated by presence of sorbent pads.		In 1996, a minor spill was reported at the Main transformer. On 18 June 2004, there was fire at the Main transformer. Transformer oil and fire fighting foam were spread outside the containment. Minor seepage noted. Containments for Main, Auxiliary and Startup Transformers T-3A and T-3B are all connected and drain to MH-A. The source of PCBs detected in MH-A may have been associated with an explosion and fire in the Auxiliary Transformer in 1973.			As part of the 2001 Phase II, a composite soil sample was collected adjacent to the Main Transformer and analyzed for PCBs.	PCBs were not detected above MDLs in the soil sample.	Yes, to determine if additional releases have occurred and to analyze for additional parameters	Surface soil sample SS0807 and groundwater grab sample GW0807 were collected at this PCS. Due to the previous fire noted at that this PCS, soil samples were collected and analyzed for perfluorooctanoic acid (PFOA) and dioxins and groundwater was collected and analyzed for perfluorinated chemicals (PFCs).	No PAHs, TPH, PCBs or dioxins/furans were detected in the soil. Several PFAs were detected in the groundwater grab sampled (GW0807). The concentration of Perfluoroheptanoic acid (PFHpA) (0.141 ug/l) exceeded the VT GES of 0.02 ug/l in the sample collected from the groundwater at the Main transformer (GW0807). Total RPAs also exceeded the VT GES at this location.	Installation of a monitoring well to be included in the Groundwater Monitoring Program. Groundwater analyses will include PFAs.
8	5	8-8	Auxiliary Transformer	Located on the west side of the Turbine Building. It has a 4,920-gallon capacity of non-PCB oil.	Transformer is within a concrete containment vault connected to the North Storm Drain system through MH-A. No soil staining was observed.		No staining was observed. During an employee interview it was noted that there was an explosion and fire in the Auxiliary Transformer in 1973. Oil was released to the ground beyond the containment area. No record of the incident could be found. Based on the transformer age, it may have contained PCB-oil.					Yes, to determine if any releases have occurred.	Surface soil sample SS0808 and groundwater grab sample GW0808 were collected at this PCS. Due to the previous fire noted at that this PCS, soil samples were collected and analyzed for perfluorooctanoic acid (PFOA) and dioxins and groundwater was collected and analyzed for perfluorinated chemicals (PFCs).	No PAHs, TPH, PCBs or dioxins/furans were detected in the soil at DP0808. PFAs were detected in shallow soil (SS0808) and in the groundwater grab sample (GW0808). Total PFAs also exceeded the CT GES at this location.	Installation of a monitoring well to be included in the Groundwater Monitoring Program. Groundwater analyses will include PFAs.
8		8-9 and 8-10	Start-up Transformers T-3A and T-3B	Located on the west side of the Turbine Building. Each have a 3,720-gallon capacity of non-PCB oil.	Transformers are within concrete containment vaults connected to the North Storm Drain system through MH-A. No staining observed.		No staining observed.					Yes, to determine if any releases have occurred.	Surface soil samples SS0809 and SS0810 were collected.	PCBs were not detected in either surface soil sample however; trace concentrations of several PAHs were detected, below the RVSS.	Further evaluation of the shallow soil upon removal of these transformers.

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Intake and Discharge Systems															
9		9-1 and 9-2	Intake and Discharge Structure Hydraulic Gate Operating Systems (2)	Hydraulic gate systems at the intake and discharge structures each contain 210-gallons of non-PCB oil	Not Discussed		Systems contain hydraulic oil in sump tanks contained within moated fiberglass building. Systems were not observed.					Yes, to determine if any releases have occurred.	Due to the enclosed hydraulic systems and their locations, no sampling was proposed for this AOC as part of this phase of investigation.		Soil screening and sampling to be coordinated with structure demolition.
9		9-3	350-gallon Diesel Fire Pump AST	Located in the intake structure	All ASTs have secondary containment including double-walled construction. No evidence of a release observed.		Tank appears to be well maintained and in good condition with no visible evidence of a release.		Reported as active in the 2017 Phase I by Normandeau.			Yes, to determine if any releases have occurred.	Due to the interior location of the tank and no visual evidence of a release, no sampling was proposed for this PCS.		Soil screening and sampling to be coordinated with structure demolition.
9	6	N/A	1,230-gallon Sulfuric Acid AST	Located in the chemical storage building adjacent to the intake structure	This AST has secondary containment. No evidence of a release observed.		Tank and secondary containment appear to be well maintained and in good condition. During an interview, an employee recalled that the acid tank was overfilled once during the 1970s and acid entered the river. A leak from the tank was reported in 1997.		Empty, no longer in use according to 2017 Phase I by Normandeau		Based on the age of the release and its location in close proximately to the river, it is unlikely impacts to site soils or groundwater remain. As part of the investigations for other potential contamination source at the intake structure, samples will be analyzed for pH.	No			No further action is recommended.
9	7	N/A	5,000-gallon Sodium Hypochlorite AST	Located in the chemical storage building adjacent to the intake structure	This AST has secondary containment. No evidence of a release observed.		Tank and secondary containment appear to be well maintained and in good condition, with no indication of spills or leaks. In 1996, minor leakage from system components that entered the storm drain and river was reported.		Empty, no longer in use according to 2017 Phase I by Normandeau		Based on the age of the release and its location in close proximately to the river, it is unlikely impacts to site soils or groundwater remain.	No			No further action is recommended.
9		N/A	275-gallon Polyethylene Tote of Bulab (water treatment chemical)	Located outside the chemical storage building, within secondary containment spill berm.	Not Discussed		Container appeared to be in good condition. Reportedly there was an incidental spill of Bulab outside the chemical storage building. No staining observed.				No reported spills or leaks.	No			No further action is recommended.
9		N/A	330-gallon Polyethylene Tote of Superchlor (water treatment chemical)	Water treatment chemical located outside the chemical storage building on asphalt adjacent to the intake structure	Not Discussed		Container appeared to be in good condition with no visible indication of leaks or spills.				No reported spills or leaks. The tank was removed in early 2015.	No			No further action is recommended.
9		N/A	2,900-gallon Sodium Bromide AST	Located in the chemical storage building adjacent to the intake structure	Tank has secondary containment. No visible evidence of a release observed.		Tank and secondary containment appear to be in good condition, with no indication of spills or leaks.		Tank was pumped empty in July 2016 by ENRPO and product was properly disposed of. It is no longer in use according to 2017 Phase I by Normandeau		No reported spills or leaks.	No			No further action is recommended.
Parking Lots															
10		10-1 through 10-4	Site Parking Lots and Outbuildings	Main parking lot, Plant Support parking lot and overflow parking lot and outbuildings (i.e. salt shed and "dog pound") located in the parking lot areas.	Not Discussed		Not discussed.				Not previously investigated.	Yes, releases from leaking equipment/vehicles may have occurred in parking areas impacting underlying soils	Surface and subsurface soil samples from DP1011 through DP1013 at PCS 10-4. Shallow soil samples were analyses included herbicides and pesticides. Additional soil screening and sampling is proposed for the other PCS's at a later date. A groundwater sample was collected from GZ-8S (downgradient) of the Main Parking Lot (PCS 10-1) and submitted for analysis of VOCs, PAHs, TPH, and total TAL metals.	Herbicides were not detected in any of the samples from PCS 10-4. Pesticides 4,4'-DDE and 4,4'-DDT were detected at concentrations below the residential USEPA RSL in the two soil samples collected from DP1013 located adjacent to the east (down-downgradient) side of the "dog pound".	The completion of other proposed soil screening and sampling at the time of demolition/pavement removal to evaluate subsurface soil conditions in the Main Parking Lot (PCS 10-1) the PSB Parking Lot (PCS 10-2) and the Overflow Parking Lot (PCS 10-3).
Hazardous Materials Storage															
11		11-1	Hazardous Materials Storage Building	Located northeast of South Warehouse	Area properly labeled and in good condition; No leaks or damaged containers observed		Building has steel walls and floor. Six-inch high steel grate supports plywood floor above steel subfloor. Six-inch gap in plywood around perimeter of floor allows drainage of potential spills and containment within underlying steel subfloor.				Currently only used to store 55-gallon drums of new oil for use in plant equipment.	Yes, need to determine current conditions.	Soil samples were collected from DP1101 advanced at this PCS.	With the exception of trace concentrations of the common laboratory contaminants acetone and methyl ethyl ketone (MEK), no VOCs, SVOCs, or PCBs were detected. TPH (DRO) was detected at a low concentration (32.8 mg/kg) in the deeper sample (5 to 7 ft bgs)	No further action is recommended.
11		11-2	Hazardous Waste Storage Building - Former Location	Located west of Main Septic System leach fields, adjacent to the Grounds Maintenance Building	PP-7503 provides details of VYNPS Hazardous Waste Program		Small containers of spent solvents, oily rags, etc. in storage. Area properly labeled and in good condition; No leaking or damaged containers observed. Regulated under EPA ID VTD 045011533. Entergy Nuclear Management Manual ENN-EV-106 Rev 0 describes the Waste Management Program.				Building relocated in 2015.	Yes, need to determine current conditions.	Soil samples were collected from DP1102 advanced at this PCS.	With the exception of trace concentrations of the common laboratory contaminants acetone and bis(2-ethylhexyl)phthalate, no VOCs, SVOCs, TPH or PCBs were detected.	No further action is recommended.
11		11-3	Hazardous Waste Storage Structure - Current Location	Located at the Shipping and Receiving Warehouse	Not Discussed		Main storage facility for small containers of hazardous wastes including spent solvents, oily rags, and other corrosive, reactive, toxic, or special listed wastes.				Building was relocated from its former location and is adjacent to the shipping and receiving warehouse, and is currently used as a short term storage area for universal and hazardous waste.	Yes, need to determine current conditions.	Soil samples were collected from DP1103 advanced at this PCS.	With the exception of trace concentrations of the common laboratory contaminants acetone and bis(2-ethylhexyl)phthalate, no VOCs, SVOCs, TPH or PCBs were detected.	No further action is recommended.

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Former Edson's Gulf Station and Garage															
12		12-1 through 12-5	Former Edson's Gulf Station	306 Governor Hunt Road (currently VYNPS facilities garage)	Not owned by Entergy at the time of the June 2001 Phase I/II.		Purchased by Entergy in 2007, the property is currently used by VYNPS Maintenance for equipment storage. During May 1, 2014 inspection the following items were observed in the backroom: (1) ~100-gallon poly used oil tank; (2) 55-gallon steel lube oil drums on secondary containment skid; (2) steel nonflammable chemical cabinets; (2) steel flammable material cabinets; (1) 275-gallon steel fuel oil AST; (1) sea-van storage container in the south yard containing equipment; (3) 55-gallon steel drums of virgin lube oil- two on a wooden pallet, one on bare ground on east side of building; ~(6) 55-gallon poly drums containing water; (1) ~ 200-gallon steel portable diesel tank. All containers in good condition; no visible evidence of releases.	Phase I ESA completed Oct 11, 2007 prior to Entergy purchase. State listed site (SMS #1993-1485) due to a release of gasoline from 2 USTs and impacts to groundwater and water supply wells. USTs removed in 1990. Monitoring wells installed during site investigation in 1993. Soil vapor extraction system operated from Dec 1994 to Aug 1999. Two VOCs exceeded VT PGQS in one MW in 2006. Other areas of concern include a petroleum-stained floor drain in north bay of garage that drained to a drywell and an in-ground Hydraulic lift. The floor drain and lift pit have been sealed with concrete. Phase II investigation of these areas completed Nov 30, 2007. Letter from VTDEC dated Jan 20, 2009 designated SMS Site No. 93-1485 as "Site Management Activities Completed" and no additional work regarding the gasoline leak required.		In 2007, ECS performed a Phase I ESA on this parcel. They identified the floor drain, dry well, in-ground hydraulic lift, and existing water supply wells as RECs requiring additional investigation. In 2015, some sampling and investigations were completed at this site. Soil samples collected from the floor drain contained concentrations of TPH (DRO), arsenic, chromium and lead above the Industrial Soil Standards (VT IROCP April 2012).	Impacted soils remain in place on-site. Although the dry well area has been excavated, soil samples in the area were not collected. This is a data gap.	Yes. Not all RECs have been investigated. Floor drain soil samples contained TPH (DRO) and metals (lead, arsenic and chromium) at concentrations exceeding Industrial Soil Standards.	Soil samples were collected from DP1201, DP1202, DP1205 and DP1206 that were advanced in the area of the former gasoline USTs and associated dispensers (PCS 12-1); from DP1203 and DP1204 in the area of the former dry well (PCS 12-3) and from DP1209 downgradient of the former gas station. Grab groundwater samples were collected at DP1201, DP1202 and DP1209.	In the area of the former gasoline USTs (PCS 12-1), with the exception of acetone, no VOCs were detected. PAHs were detected below the RVSS in the surface soil at DP1201 and DP1205. TPH (DRO) was also in the surface sample from DP1205 and this location also exceeded the benxo(a)pyrene TEQ value. No VOCs or TPH were detected in grab groundwater samples collected from DP1201 and DP1202. Trace concentrations of diethyl phthalate and fluorene were in the groundwater collected from DP1202. At the former dry well (PSC 12-2), with the exception of acetone, no VOCs, TPH or PCBs were detected. Several PAHs were detected at low concentrations in the 13 to 14 ft bgs sample from DP1203. At DP1209, downgradient of the former gas station operations, other than acetone, no VOCs, SVOCs, TPH or PCBs were detected above laboratory reporting limits. No VOCs, TPH or PCBs were detected in the groundwater grab sample at this location. Several PAHs were detected at concentrations below the VT GES.	Further evaluation of the floor drain in the garage (PCSs 12-2), the inground hydraulic lift (PCS 12-4) and 275-gallon UST (PCS 12-5) is recommended the time of building demolition.
Septic Systems and Application Areas															
13		13-1	Main Septic System	The Main Septic System located north of the protected area has 3 leach fields, one is split into two to accommodate a duct bank that runs through the area.	Groundwater in monitoring wells (MWs) monitored semiannually	Yes, Phase II sampling performed	Groundwater in MWs in leach field and effluent sampled semiannually. The sample results are in compliance with Vermont Agency of Natural Resources (VANR) Groundwater Protection Rules and VANR Solid Waste Management Rules. Regulated by VTDEC Indirect Discharge Permit (IDP) IDP 9-0036. When the septic tanks are pumped the sludge is sampled, analyzed and spread in the South Field Application Area (see COB Septic System).		System active according to the 2017 Phase I by Normandeau	Soil and groundwater samples were collected from the leach field as part of the 2001 Phase II. Samples were analyzed for VOCs, TPH, total 13 PP metals and radiological parameters. Groundwater samples are collected from MWs in the leach field and effluent is sampled semiannually.	TPH was detected at 73 mg/kg in one of the four soil samples analyzed. No concentrations of VOCs or TPH were detected above MDLs in any of the other soil samples. Metal concentrations were within background ranges. TPH was detected (0.55 mg/L) in one (1101) of nine GW samples collected. No VOCs were detected in GW above MDL. Dissolved zinc was the only metal detected above MDLs. Concentrations ranged from 0.0355 mg/l to 0.144 mg/l. Results of the semiannual effluent sampling are in compliance with VANR Groundwater Protection Rules.	Yes, releases may have occurred to this area since last tested in 2001	DP1301 and DP1302 were advanced in the area of the Main septic system and leach fields to evaluate potential impacts to soil and groundwater was collected from downgradient monitoring wells 1303 and 1303R to evaluate potential impacts to groundwater quality.	Trace concentrations of acetone were detected in all four soil samples collected from this PCS. Methylene chloride and toluene were detected at concentrations below the RVSS in the sample collected at the water table (12-14 ft bgs) in DP1302. SVOCs and TPH were not detected. Metals were below the RVSS or site background values with the exception of vanadium in the surface soil (0 to 1 ft bgs) at DP1302. Vanadium was reported at a concentration of 33 mg/kg, above the Site background value of 28 mg/kg. No VOCs, SVOCs, TPH, or PCBs were detected in the groundwater at this PCS. Total metal concentrations were all below the VT GES.	
13		13-2	New Warehouse Septic System	South of the Protected Area, this system consists of 2 alternating pressurized leach fields and one tank.	Groundwater in MWs monitored semiannually	Yes, Phase II sampling performed	Groundwater in MWs in leach field and effluent sampled semiannually. The sample results are in compliance with VANR Groundwater Protection Rules and VANR Solid Waste Management Rules. Regulated by VTDEC Indirect Discharge Permit IDP 9-0036. When the septic tanks are pumped the sludge is sampled, analyzed and spread in the South Field Application Area (see COB Septic System).		Septic tank and effluent lift stations were pumped in April 2016, after the system was retired from service. Residual may remain in tanks. System inactive according to the 2017 Phase I by Normandeau.	Soil and groundwater samples were collected from the leach field as part of the 2001 Phase II. Samples were analyzed for VOCs, TPH, 13 PP metals and radiological parameters. Groundwater samples are collected from MWs in the leach field and effluent is sampled semiannually.	VOCs or TPH were not detected above MDLs in soil. Metal concentrations were within background ranges. TPH was detected in GW at 0.84 mg/l (well 3301). No VOCs or dissolved metals were detected above MDLs in the GW. Results of the semiannual effluent sampling are in compliance with VANR Groundwater Protection Rules.	Yes, releases may have occurred to this area since last tested in 2001	DP1303 was advanced adjacent to the New Warehouse septic system to evaluate impacts to soil and groundwater was collected from downgradient monitoring well 3401 to evaluate potential impacts to groundwater quality	Trace concentrations of acetone and MEK were detected in the surface soil. No SVOCs, TPH or PCBs were detected. Metals were all below the RVSS or Site background values. No VOCs or PAHs were detected in the groundwater from 3401 and total metal concentrations were below the propose GESVT GES.	
13		13-3	Construction Office Building (COB) Septic System and Overflow	COB Septic System consists of 1 pressurized mound leach field and 1 tank west of Gate 3, adjacent to the spray pond. The "COB Overflow" system was not constructed until 2003. It consists of 1 leach field and 1 tank north of the PSB.	Groundwater in MWs monitored semiannually; Total petroleum hydrocarbons (TPH) slightly greater than VT Primary Groundwater Quality Standard (PGQS)	Yes, Phase II sampling performed	Groundwater in MWs in leach field and effluent sampled semiannually. The sample results are in compliance with VANR Groundwater Protection Rules and VANR Solid Waste Management Rules. Regulated by VTDEC Indirect Discharge Permit IDP 9-0036. Slightly elevated chloride levels likely due to nearby Application of road de-icing salt. Sludge from the COB, New Warehouse and Main septic systems is accumulated in the 12,000-gallon COB holding tank before spreading in the South Field Application Area in accordance with VY RP 4615, VTDEC Residuals Management Permit No. F9906, and NRC 10 CFR 20.2002 Septage Spreading Permit.		System was retired from service. Residual may remain in tanks. System inactive according to the 2017 Phase I by Normandeau	Soil and groundwater samples were collected from the leach field as part of the 2001 Phase II. Samples were analyzed for VOCs, TPH, total 13 PP metals and radiological parameters. Groundwater is monitored semiannually.	VOCs or TPH were not detected above MDLs in soil. Metal concentrations were within background ranges. For GW, MTBE and TPH were detected at 1.1 ug/L and 2.0 mg/L, respectively. No concentrations of dissolved metals were detected above MDLs. Results of the semiannual effluent sampling are in compliance with VANR Groundwater Protection Rules.	Yes, releases may have occurred to this area since last tested in 2001	DP1304 was advanced adjacent to the former leach field and septic system that serviced the COB to evaluate potential impacts to soil and groundwater was collected from downgradient monitoring well 3301 to evaluate potential impacts to groundwater quality. DP1305 was advanced adjacent to the former COB overflow septic tank and leach field area to evaluate potential impacts to soil.	At the COB septic system, with the exception of acetone, no VOCs, SVOCs, TPH or PCBs were detected. Concentrations of metals were below the RVSS or Site background values. No VOCs or PAHs were detected in the groundwater collected from 3301 however; concentrations of arsenic and manganese exceeded the VT GES. In the area of the COB Overflow septic system, with the exception of acetone, no VOCs, SVOCs, TPH or PCBs were detected in the soil. Concentrations of metals were below the RVSS or Site background values.	
13		13-4	South Field Application Area	Approx. 2 acres in size, septage sludge and cooling tower silt are applied to this area.		Yes, Phase II sampling performed	Septage and soil are analyzed prior to each land application. Groundwater is sampled for radiological constituents quarterly and for non-radiological constituents semi-annually and prior to land applications.			Eight soil samples and seven GW samples were collected and analyzed for VOCs, TPH, 13 PP metals and radiological parameters during the 2001 Phase II investigation. TPH was detected in four samples at concentrations ranging from 39 mg/kg to 230 mg/kg. VOCs were not detected in any of the soil samples at concentrations above the MDLs. Metals were within background concentration ranges. In GW, no VOCs or TPH were detected above MDLs. Soluble zinc was the only metal detected above MDLs. Concentrations ranged from 0.184 mg/L to 0.301 mg/L.	TPH impacts to soil are present. According to the 2014 HSA, the septage sample results comply with IDP permit (ID-9-0036) requirements.	Yes, TPH impacts noted in the 2001 Phase II. Other releases may have occurred to this area since last tested in 2001.	DP1306 through DP1308 were advanced in the area around the South Application Field to evaluate potential impacts to soil. Groundwater grab samples (GW1306 through GW1308) were collected from the direct push boring locations as well as monitoring wells 202, 203 and 204 to evaluate potential impacts to groundwater quality at this PCS.	With the exception of acetone, no VOCs, TPH or PCBs were detected in the soil. Several PAHs were detected at concentrations below the RVSS in the surface soils (0 to 1 ft bgs) at DP1307 and DP1308, but at DP 1308, PAH concentrations exceeded the benzo(a)pyrene TEQ. With the exception of acetone, no VOCs or TPH were detected in the groundwater. SVOCs ((bis(2-Ethylhexyl)phthalate, diethyl phthalate, and di-n-butylphthalate)) were detected in the groundwater grab sample from DP1307 and (diethyl phthalate) was detected in the groundwater grab sample from DP1308 at concentrations below the VT GES. Total metals exceeded the VT GES for several compounds in the grab samples. No VOCs or PAHs were reported in the groundwater collected from permanent monitoring wells in this PCS. The only total metal concentration that exceeded the VT GES, was manganese in the sample collected from 202.	

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Former Edson's Gulf Station and Garage (continued)															
13	12	13-5	North Field Application Area	Approx. 8 acres in size, this area was intended for spreading septage, but not used for that purpose. During the Phase I/II ESA, a rusted 55-gallon drum half buried in fill was observed. Debris consisting of plastic sheeting, rebar, wooden planks, glass, concrete etc. was encountered. Drum was reportedly removed on 2 June 2001.		Yes, Phase II explorations performed	Southern 3/4 of area occupied by new VELCO substation. Area not used for spreading septage. Groundwater not currently sampled from area monitoring wells.		A portion of the North Field Application Area was used for development of the VELCO substation area, leaving approximately 2.9 acres. Although this area was reportedly not used for septage application, soil piles were observed northeast of this area during the 2017 Phase I.	Six soil samples, a sediment sample, a surface water sample and nine GW samples were collected as part of the 2001 Phase I and II ESA. Samples were analyzed for one or more of the following: VOCs, TPH, PAHs, PCBs, 13 PP metals and radiological parameters.	TPH was detected in four of the soil samples at a range of 43 mg/kg to 410 mg/kg. No VOCs were detected and metals were within background ranges for soil. The sediment and surface water samples collected from a drainage ditch near the Sonotube silt storage area did not contain VOCs, TPH, PCBs or PAHs. Metals were within background concentrations. In GW, TPH was detected at 3.0 mg/L in the sample collected from MW 101. No VOCs or dissolved metals were detected above MDLs.	Yes, TPH impacts noted in the 2001 Phase II. Other releases may have occurred to this area since last tested in 2001. Soil piles will require sampling for beneficial reuse on site and/or off-site disposal	DP1309 through DP1311 were advanced in the area of the North Application Field (PCS 13-5) to evaluate potential impacts to soil. Groundwater grab samples (GW1309 through GW1311) were collected from DP1309 through DP1311 and a groundwater sample was also collected from down/cross gradient monitoring well 101 to evaluate potential impacts to groundwater quality.	With the exception of acetone, no VOCs, SVOCs, or TPH were detected. Total metals were below the RVSS or Site background values with the exception of manganese in the deeper soil sample from DP1310, and vanadium in the surface soil at DP1311. No VOCs or TPH were detected in the groundwater grab samples collected at this PCS however; several SVOCs were detected below the RVSS. Total metals exceeded the VT GES for several compounds however; the elevated metal concentrations are likely associated with the suspended solids. Groundwater collected from 101 (downgradient), no VOCs or PAHs were detected, and total metal concentrations were all below the VT GES.	No further investigation is recommended. Removal and off-site disposal of the stockpiled soil and debris is recommended. Soil beneath the piles will be evaluated following removal.
13		N/A	Gatehouse Septic	Consists of 1 leach field and 1 septic tank east of Gatehouse No. 1	Groundwater in MWs monitored semiannually		Groundwater in MWs in leach field sampled semiannually. The sample results are in compliance with VANR Groundwater Protection Rules. Regulated by VTDEC Indirect Discharge Permit IDP 9-0036.		System inactive according to the 2017 Phase I by Normandeau. Tank was pumped for the final time on 27 July 2015, after the system was retired.	Groundwater is monitored semiannually.	Results are in compliance with VANR Groundwater Protection Rules.	No. Based on use and lack of potential chemical release to system, no further investigation warranted.			No further action is recommended.
13		N/A	Plant Support Building (PSB) Septic System	Consists of two alternating pressurized leach fields and one 3,000-gallon tank, south of the PSB.	Groundwater in MWs monitored semiannually		Groundwater in MWs in leach field and effluent sampled semiannually. The sample results are in compliance with VANR Groundwater Protection Rules and VANR Solid Waste Management Rules. Regulated by VTDEC Indirect Discharge Permit IDP 9-0036. Slightly elevated chloride levels likely due to nearby application of road de-icing salt.		System active according to the 2017 Phase I by Normandeau			No. Based on use and lack of potential chemical release to system, no further investigation warranted.			No further action is recommended.
13		N/A	Governor Hunt House Septic	Consists of 1 leach field and 1 septic tank east of the building	Groundwater in MWs monitored semiannually		Groundwater in MWs in leach field sampled semiannually. The sample results are in compliance with VANR Groundwater Protection Rules. Regulated by VTDEC Indirect Discharge Permit IDP 9-0036.		System active according to the 2017 Phase I by Normandeau	Groundwater is monitored semiannually.	Results are in compliance with VANR Groundwater Protection Rules.	No. Based on use and lack of potential chemical release to system, no further investigation warranted.			No further action is recommended.
Storm Water Outfalls															
14	8	14-1	North System Outfall (S/N 006)	Outfall is east of plant stack.	Drains portions inside and outside the Protected Area. Dissolved PCBs detected in MH-A oil/water separator of this system. Source is drainage from the Main Transformer containment vault.	Yes, Phase II sampling performed	No staining observed. Waste water from the Turbine Building was released to the North Storm Drain in 1983.			Two wastewater samples were collected from the North Outfall area as part of the 2001 Phase II. Samples were analyzed for one or more of the following: VOCs, TPH, PAHs, PCB, 13 PP metals, and radiological parameters.	TPH was detected at 1.2 mg/L in one of the two samples collected. VOCs, PAHs, and PCBs were not detected above MDLs. Total zinc was the only metal detected (0.0755 mg/L).	Yes, need to determine current conditions.	Sediment sample SD1401 was collected from this outfall and analyzed for COCs.	With the exception of acetone, no VOCs, PCBs, herbicides or pesticides were detected. Low concentrations of TPH (GRO), several PAHs and dioxins/furans were reported at this location.	Screening Level Ecological Risk Assessment and further evaluation of dioxins/furans will also be conducted to determine if they are associated with a release on-site.
14	9	14-2	South System Outfall (S/N 007)	Outfall is inside the Cooling Water Discharge.	Drains portions inside and outside the Protected Area. Oil/water separator (MH-C) had no oil on 8 May 2001. Oil/water separator (MH-B) connected to sump in containment for 75,000-gallon Main Fuel Oil AST	Yes, Phase II sampling performed	No staining observed. During an interview an employee recalled that a valve on the turbine lube oil pipeline was misaligned during an outage in the late 1970s. Oil was pumped through the oil tank vent to the roof of the Turbine Building. It flowed to a downspout, through the storm water drain and to the river at the discharge structure. In 1976, the condensate storage tank overflowed approximately 83,000 gallons that drained to the river (Reportable Occurrence No. RO-76-22/1T).			Two wastewater samples were collected from the South Outfall area as part of the 2001 Phase II. Samples were analyzed for one or more of the following: VOCs, TPH, PAHs, PCB, 13 PP metals, and radiological parameters.	TPH was detected at 11 mg/L in one of the two samples collected. VOCs, PAHs, and PCBs were not detected above MDLs. Low levels of total copper (0.0057 mg/L) and total zinc (0.0307mg/L) were detected.	Yes, need to determine current conditions.	Sediment sample SD1402 was collected from this outfall and analyzed for COCs.	No VOCs, SVOCs, TPH, PCBs, pesticides or herbicides were detected in the sediment at this location however; concentrations of cadmium, copper, nickel and zinc were above the VT TEC but below the VT PEC. Low concentrations of several dioxins/furans were also detected.	Screening Level Ecological Risk Assessment and further evaluation of dioxins/furans will also be conducted to determine if they are associated with a release on-site.
14		14-3	Southeast System Outfall (S/N 008)	Outfall south of the East Cooling Tower	System consists of one catch basin draining to outfall south of the East Cooling Tower.		No staining observed.					Yes, need to determine current conditions.	This outfall could not be accessed safely for sample collection.		Obtain sample if outfall can be safely access from the river.
14		14-4	345 kV Switchyard Outfall (S/N 010)	Outfall north of the North Storm Water System Outfall	Perimeter curtain drain drains to outfall		No staining observed.					Yes, need to determine current conditions.	This outfall could not be accessed safely for sample collection.		Obtain sample if outfall can be safely access from the river.
14		14-5	115 kV Switchyard Outfall (S/N 011)	Outfall discharges to the CT River north of the 345 kV Switchyard outfall	Perimeter curtain drain drains to outfalls		No staining observed.					Yes, need to determine current conditions.	Sediment sample SD1405 was collected from this outfall and analyzed for COCs.	With the exception of acetone, No VOCs, SVOCs, TPH, PCBs, pesticides or herbicides were detected in the sediment at this location however; zinc was above the VT TEC but below the VT PEC. Low concentrations of several dioxins/furans were also detected.	Screening Level Ecological Risk Assessment and further evaluation of dioxins/furans will also be conducted to determine if they are associated with a release on-site.
14		14-6	Combined VELCO/VY Outfall (S/N 012)	Collects storm water from VELCO substation and VY parking lots and fields and discharges to the CT River north of the 115 kV Switchyard outfall	System drains storm water from VELCO substation and VY parking areas and fields							Yes, need to determine current conditions.	Sediment sample SD1406 was collected from this outfall and analyzed for COCs.	With the exception of acetone, No VOCs, SVOCs, TPH, PCBs, pesticides or herbicides were detected in the sediment at this location. Metal concentrations are below the TEC. Low concentrations of several dioxins/furans were detected.	Screening Level Ecological Risk Assessment and further evaluation of dioxins/furans will also be conducted to determine if they are associated with a release on-site.

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Cooling Tower Area															
15		15-1	Creosote-coated Wooden Pilings beneath Cooling Towers	Pilings beneath Cooling Towers	Not Discussed						Not previously investigated.	Yes, chemicals may have leached impacting soils in contact with piles and groundwater quality	Prior to this investigation, Site personnel that were present during cooling tower construction, recall the foundations being concrete and not supported by wooden pilings. DP1501, DP1502, DP1503, and DP1504 were still advanced adjacent to the towers to evaluate soil and groundwater.	Except acetone, no VOCs or PAHs were detected in soil at any of the DP locations. Metals were below the RVSSs and/or Site background value. In the groundwater grab samples (GW1501 through GW1504) except for acetone, no VOCs were detected. Several PAHs were detected at concentrations below the VT GES in GW1504. Total metal concentrations for several compounds exceeded the VT GES however; the elevated concentrations are likely associated with suspended solids.	
15	11	15-2	Area "B-2"	Located between East and West Cooling Towers	Temporary storage of sediment collected from the cooling towers.	Yes, Phase II sampling performed	Sediment from cooling towers no longer stored here; two flammable liquids cabinets containing small containers of oils.			Soil samples were collected during the 2001 Phase II investigation. Samples were analyzed for VOCs, TPH, total 13 PP metals and radiological parameters.	Waste oil reportedly spread on the ground in this area during early plant operations3. TPH in both soil samples collected from this area at 67 mg/kg and 100 mg/kg during the Phase II investigation. VOCs were not detected and metal concentrations were within background ranges.	Yes, TPH impacted soil present.	DP105 and DP1506 were advanced in this area to collect soil and groundwater grab samples (GW1505 and GW1506).	Except acetone, no VOCs were detected in the soil at this PCS. Several PAHs were detected at low concentrations in the surface soil at DP1506. Metal concentrations were below the RVSS or Site background values. In grab groundwater samples (GW1505 and GW1506) no VOCs were detected. A trace concentration of the PAH phenanthrene was detected in the groundwater collected from DP1506. Total metal concentrations for several compounds exceeded the propose VT GES however; the elevated concentrations are likely associated with suspended solids.	Although no further soil investigations are recommended, a monitoring well will be installed at this AOC to evaluate elevated metals in the groundwater.
15	10	15-3	Laydown Area southeast of Cooling Towers	Area southeast of Cooling Towers	Not Discussed		Several soil and asphalt piles were observed as well as discarded fuel shipping boxes. According to a former employee, it was reported that cable unused during plant construction was buried in this area.		Soil and debris piles were observed during Normandeau's site visit as part of the 2017 Phase I.			Yes, area will be investigated for potential releases impacting soil and groundwater. Soil and debris piles will be sampled for potential beneficial reuse on-site or off-site disposal.	DP1507 and DP1508 were advanced in this area to collect soil and groundwater (GW1507 and GW1508) to evaluate potential impacts from this PCS. Additionally, soil samples (SP1501 and SP1502) were collected from the stockpile at this location for characterization.	Except for acetone, no VOCs, TPH, PCBs, herbicides or pesticides were detected in the soil. Several PAHs were below the RVSS in the surface soil samples (0 to 1 ft bgs) collected at each boring however; they were not detected in the deeper soil. No TPH, PCBs, pesticides or herbicides were detected in the groundwater. No VOCs were reported in GW1507 however; VOCs were detected in GW1508. Low concentrations of PAHs were detected in both samples, below the VT GES. Total metals were all below the VT GES.	As mentioned above, a monitoring well will be installed to further evaluate groundwater quality at this AOC. The stockpiled soil did not contain any COCs above RVSS or Site background values.
15		N/A	190-gallon BSB Portable Diesel Fire Pump Tank	Portable diesel fire pump fuel tank south of the 345 kV Switchyard.	Not Discussed		Emergency pump to augment plant fire protection system pumps. Tank appears to be in good condition. No visible indication of leaks or spills.		Active and located between the cooling towers according to the 2017 Normandeau Phase I. Stored in a newly constructed shed.		Portable fire pump with tank. No reported spills or leaks. Storage area will be inspected for visible evidence of a release. If staining is observed, concrete chip samples may be collected for characterization.	No			No further action is recommended.
Railroad Lines															
16		16-1	Railroad Lines are present on Site.	Historic practices along railroad lines included spraying pesticides/herbicides and applying PAHs to wooden rail ties which are treated with preservatives.	Not Discussed	Not Discussed	Not Discussed	Not Discussed	Not Discussed				Surface soil samples SS1601 through SS1610 were collected approximately every 200 ft. along Site rail lines and submitted for analysis of COCs.	Herbicides were not detected in any of the samples. Pesticides were detected in two samples, 4,4-DDT was detected in SS1606 and 4,4'-DDT and 4,4'-DDE were detected in SS1607. PAHs were detected at low concentrations in all but one location sampled (SS1604). Concentrations were below RVSS with the exception of benzo(a)pyrene at SS1605, SS1609, and SS1610.	The rail lines on Site are currently being used to facilitate decommissioning and waste removal. Additional sampling is recommended to delineate impacts and determine appropriate remedial actions.
Site Groundwater															
17		17	Site Groundwater Quality	General Site Groundwater Quality	Not Discussed	Some Impacts to various areas noted during 2001 Phase II	Not discussed in general. AOC specific.				Current site groundwater quality (in regards to non-radiological compounds) is unknown although, quarterly analytical results from the potable water wells are available.	Yes, current groundwater conditions are unknown.	In addition to the groundwater grab samples collected at various AOCs discussed above, 32 monitoring wells were sampled using low flow techniques.	In general groundwater at the site has not been significantly impacted by historic operations. Very few COCs were detected above the VT GES. AOCs where impacts to groundwater were observed include 5, 7, 8 and 15. The installation of monitoring wells are recommended for these AOCs. They will be included in the Groundwater Monitoring Plan.	Continued groundwater monitoring in accordance with the Groundwater Monitoring Plan and the installation and monitoring of wells at AOCs 5, 7, 8, and 15.
Water Supply Wells (bedrock)															
N/A		N/A	West/Main Well	West of 345 kV Switchyard and north of the PSB parking lot	Source ID#283, depth 555 ft. tested quarterly for coliform bacteria and other chemical parameters as required by VANR in their required monitoring schedule, issued annually.	Yes, Phase II sampling performed	The only water supply well currently in use, supplying potable water to all buildings except the PSB and Power Upright Building (PUB).		Well is active according to the 2017 Phase I by Normandeau	A drinking water sample was collected from this well as part of the 2001 Phase II. The sample was analyzed for VOCs, TPH, total 13 PP metals and radiological parameters.	No concentrations of TPH or VOCs were detected in the 2001 Phase II sample. Total metals detected included copper (0.108 mg/l), total lead (0.103 mg/l) and total zinc (0.0372 mg/l). Required quarterly total coliform sample results are in compliance with requirements of permit WSID #8332.	No	A sample was collected from this well and analyzed for VOCs and PFOAs. This well is also monitored on a quarterly basis in accordance with the Potable Water Supply Permit.	No compounds were detected above laboratory reporting limits.	No further actions are recommended.
N/A		N/A	NEOB Well	North of PSB	Source ID#6642, depth 500 ft. Tested quarterly for coliform bacteria.	Yes, Phase II sampling performed	Supplies potable water to PSB and PUB.		Well is active according to the 2017 Phase I by Normandeau. It only provides waster to the PSB as the PUB has been removed.	A drinking water sample was collected from this well as part of the 2001 Phase II. The sample was analyzed for VOCs, TPH, total 13 PP metals and radiological parameters.	No concentrations of TPH or VOCs were detected in the 2001 Phase II sample. The only metal detected was total copper (0.0187 mg/l). Required quarterly total coliform sample results are in compliance with requirements of permit WSID #8332.	No	A sample was collected from this well and analyzed for VOCs and PFOAs. This well is also monitored on a quarterly basis in accordance with the Potable Water Supply Permit.	No compounds were detected above laboratory reporting limits.	No further actions are recommended.
N/A		N/A	COB Well	North of COB	Source ID#214, depth 362 ft. Activated carbon filtration system to remove chlorinated solvents; tested quarterly for coliform bacteria, chlorinated solvents and other chemical parameters as required by VANR in their required monitoring schedule, issued annually.	Yes, Phase II sampling performed	Permanently abandoned on 4 February 2013.		Abandoned; grouted in place according to the 2017 Phase I by Normandeau	A drinking water sample was collected from this well as part of the 2001 Phase II. The sample was analyzed for VOCs, TPH, total 13 PP metals and radiological parameters.	Concentrations of VOCs 1,1-DCA (1.7 ug/l) and 1,1-DCE (2.3 ug/l) were detected in the sample collected as part of the 2001 Phase II. No TPH was detected. Total metals detected included copper (0.0320 mg/l), total lead (0.0146 mg/l) and zinc (0.0118 mg/l). According to the 2014 HSA, the well has been permanently abandoned.	No. Well has been permanently abandoned.			No further actions are recommended.
N/A		N/A	Southwest Well	Southwest of Turbine Building	Source ID#253, depth 500 ft. Tested Quarterly for coliform bacteria		No longer used as a source of potable water however, still used for process water. Permanently disconnected from potable water system.		Non potable use confirmed in Normandeau 2017 Phase I		Used for process water	No. Well not used for potable water. Will require proper abandonment if no longer in use.	A sample was collected from this well and analyzed for VOCs and PFOAs.	No compounds were detected above laboratory reporting limits.	No further action is recommended.

TABLE 7-1
CONCEPTUAL SITE MODEL SUMMARY
NON RADIOLOGICAL SITE INVESTIGATION REPORT
VERMONT YANKEE NUCLEAR POWER STATION

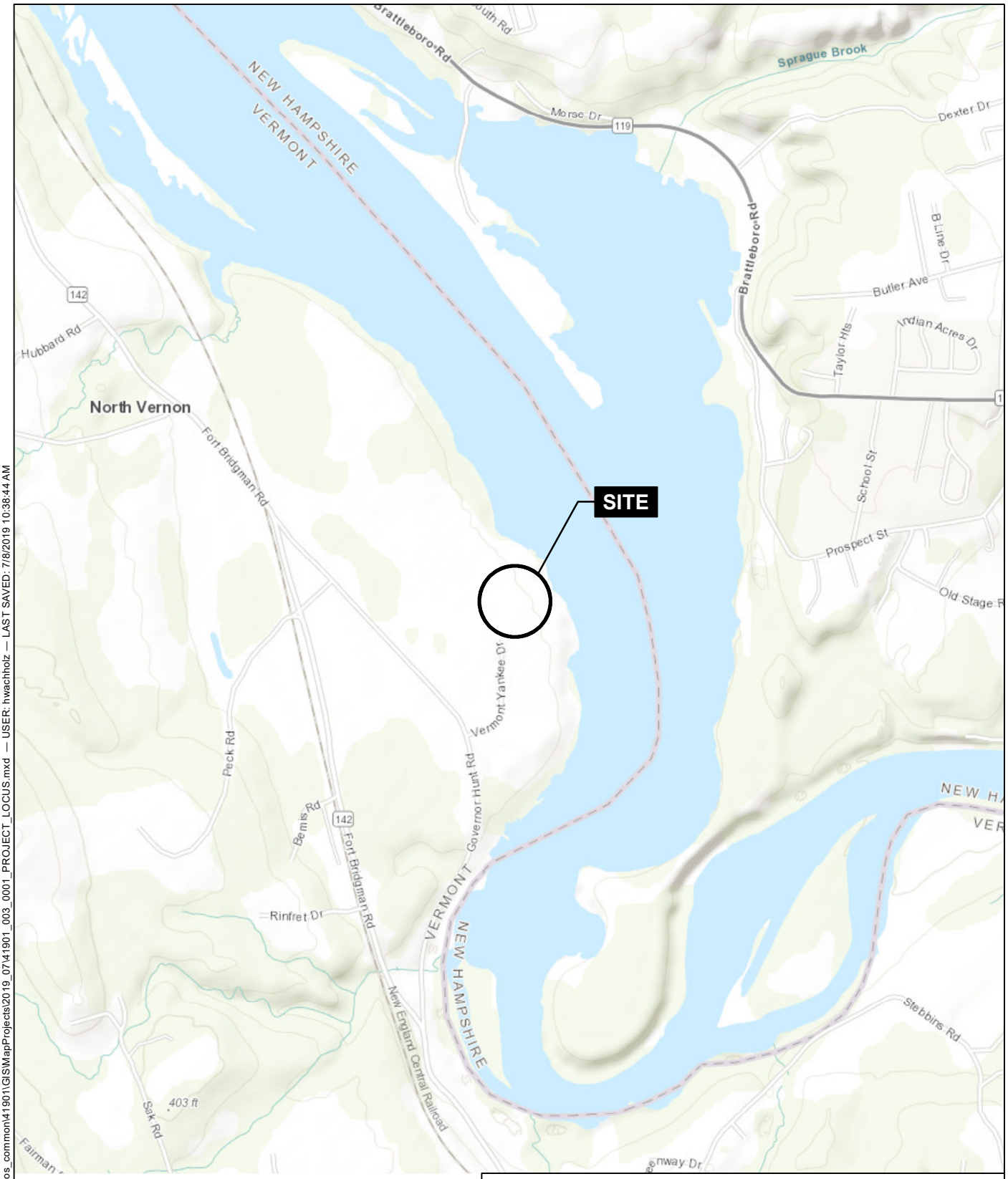
AOC No.	VANR AOC No.	PCS No.	AREAS OF CONCERN (AOCs)[1]	AOC LOCATION/DESCRIPTION	2001 PHASE I & II ESA STATUS[2]	2001 PHASE I & II RECOGNIZED ENVIRONMENTAL CONDITION[2]	2014 HSA AOC STATUS[3]	OTHER INVESTIGATIONS	2017 PHASE I ESA[4]	SUMMARY OF INVESTIGATIONS	FINDINGS/STATUS	ADDITIONAL INVESTIGATION REQUIRED	2019 SITE INVESTIGATION ACTIVITIES	FINDINGS	RECOMMENDATIONS
Small Satellite Chemical & Flammable Material Storage Areas															
N/A		N/A	Pipe Storage Building	Clean Workshop	Area properly labeled and in good condition; No leaks or damaged containers observed		(2) flammable materials cabinets, paint storage, insulation shop. Area properly labeled and in good condition; No leaking or damaged containers observed.				No evidence of a release. Building was removed in 2015.	No			No further action is recommended.
N/A		N/A	Former Environmental Laboratory Facility (ELF)	North of discharge structure	Area properly labeled and in good condition; No leaks or damaged containers observed		Building has been removed. Formerly contained small quantities of chemicals (acids, etc.) used to prepare samples for shipping and petroleum products (fuels) for use in boats used for sampling in the river.				No evidence of a release	No			No further action is recommended.
N/A		N/A	Grounds Maintenance Building	West of Main Septic System leach fields	Area properly labeled and in good condition; No leaks or damaged containers observed		Storage of lawn mowers, snow plows, string trimmers, etc. No leaking or damaged containers observed.				No evidence of a release. Building was removed in 2015.	No			No further action is recommended.
N/A		N/A	15,000-gallon Nitrogen AST	Located east of the Reactor Building	No evidence of a release observed.		Tank appears to be well maintained and in good condition, with no visible indication of leaks or spills		Empty, no longer in use according to 2017 Phase I by Normandeau		No reported releases. Not likely to impact site soil or groundwater	No			No further action is recommended.
N/A		N/A	150-gallon ethylene glycol AST	Located on the roof of the AOG Building	All ASTs have secondary containment including double-walled construction. No evidence of a release observed.		No tank found on the roof. Ethylene glycol is filled directly into AOG chillers on a large skid on the upper level of the building. Equipment is well maintained and in good condition with no indication of leaks or spills.		Empty, no longer in use according to 2017 Phase I by Normandeau		Tank not found during 2014 HSA. Located on upper level of building. Releases would not impact site soil or groundwater.	No			No further action is recommended.
N/A		N/A	Cooling Tower Fan Gearboxes	11 per tower (22 total) 12.5-gallon capacity each of non-PCB oil	Not Discussed		Gearboxes do not have oil containment devices. Gearboxes not observed.				Oil was drained from gear boxes in 2015. Only residual oil remains.	No			No further action is recommended.
N/A		N/A	Containment Access Building (CAB)	CAB, east of AOG Building	Area properly labeled and in good condition; No leaks or damaged containers observed		Original CAB was a Quonset hut structure that existed from approximately 1985 to 2006. The current CAB was constructed within the footprint of the old CAB to provide a ceiling sufficiently high to accommodate the transporter for the spent fuel dry storage casks and the shield cask. No chemicals or flammable materials are stored in the CAB currently. Waste oil was formerly burned in the CAB, but that practice has been discontinued.				No evidence of a release	No			No further action is recommended.
Compressed Gas Storage Areas															
N/A		N/A	East of South Warehouse	East of South Warehouse	Area properly labeled and in good condition; No leaks or damaged containers observed		Area properly labeled and in good condition; No leaking or damaged containers observed.				Releases of compressed gases are not likely to impact site soil or groundwater	No			No further action is recommended.
N/A		N/A	North of South Warehouse	North of South Warehouse	Area properly labeled and in good condition; No leaks or damaged containers observed		Area properly labeled and in good condition; No leaking or damaged containers observed.				Releases of compressed gases are not likely to impact site soil or groundwater	No			No further action is recommended.
N/A		N/A	Inside Southwest corner of Turbine Building	Inside Southwest corner of Turbine Building	Area properly labeled and in good condition; No leaks or damaged containers observed		Air compressors and associated compressor oil. No leaking or damaged containers observed.				Releases of compressed gases are not likely to impact site soil or groundwater	No			No further action is recommended.
N/A		N/A	West of Turbine Building	West of Turbine Building	Area properly labeled and in good condition; No leaks or damaged containers observed		Compressed gas no longer stored at this location.				Releases of compressed gases are not likely to impact site soil or groundwater	No			No further action is recommended.
N/A		N/A	Northeast of Switchgear Rooms & North of Control Room	Northeast of Switchgear Rooms & North of Control Room	Area properly labeled and in good condition; No leaks or damaged containers observed		Storage of argon and other instrument gases, as well as carbon dioxide for fire suppression. Area properly labeled and in good condition; No leaking or damaged containers observed.				Releases of compressed gases are not likely to impact site soil or groundwater	No			No further action is recommended.
N/A		N/A	Hydrogen Skid	South of Cooling Towers	Not constructed at time of Phase I/II		Area properly labeled and in good condition; tanks appear to be well maintained, with no evidence of leaks.			Hydrogen was removed from site in 2015. Pad used for equipment storage.	Releases of compressed gases are not likely to impact site soil or groundwater	No			No further action is recommended.
Other Areas Identified															
N/A		N/A	Road Salt & Sand Storage Shed	Salt and sand stored under roof, on a concrete slab. Area located north of 345 kV Switchyard.	Not Discussed		An interview with a former employee revealed this area was formerly used for storage of lawn maintenance equipment.				No visible evidence of a release	No			No further action is recommended.
N/A		N/A	Soil Piles	Soil piles located northeast of VELCO Substation	Not Discussed		Storage of silt vacuumed from west cooling tower wet well, soil removed during construction of ISFSI, etc.				According to the HSA, the soil was removed during ISFSI construction	No	Two soil samples (SP1301 and SP1302) were collected from stockpiles in this area to characterize soil for off-site disposal or potential beneficial reuse on site	With the exception of acetone, no VOCs, TPH or PCBs were detected in the soil samples (SP1301 and SP1302) collected from the stockpiles. Several PAHs were detected a low levels. Concentrations of benzo(a)pyrene in both samples exceeded the RVSS. Metals were below the RVSS or Site background values with the exception of vanadium detected in SP1302.	Removal and off-site disposal of the stockpiled soil and debris is recommended. Soil beneath the piles will be evaluated following removal.
N/A		N/A	Area "B-5"	Located west of the 115 kV switchyard	Radiological activity in soil reported in file 10CFR50.75(g)	Yes, Phase II sampling performed	No evidence of impacted soil; likely removed during construction of the VELCO switchyard.			Soil samples were collected during the 2001 Phase II investigation. Samples were analyzed for VOCs, TPH, total 13 PP metals and radiological parameters.	No VOCs or TPH were detected in soil at concentrations above the MDLs. Metal concentrations were within background ranges.	No			No further action is recommended.
N/A		N/A	Sonotube Area	Located south of the North Field Application Area	Used for the storage of dredged sediments from area of circulating water intake.		Removed from site during construction of the VELCO Switchyard. Soil was sampled, analyzed and confirmed clean.				No longer present. No evidence of a release.	No			No further action is recommended.

TABLE 7-1
CONCEPTUAL SITE MODEL SUMMARY
NON RADIOLOGICAL SITE INVESTIGATION REPORT
VERMONT YANKEE NUCLEAR POWER STATION

AOC No.	VANR AOC No.	PCS No.	AREAS OF CONCERN (AOCs)[1]	AOC LOCATION/DESCRIPTION	2001 PHASE I & II ESA STATUS[2]	2001 PHASE I & II RECOGNIZED ENVIRONMENTAL CONDITION[2]	2014 HSA AOC STATUS[3]	OTHER INVESTIGATIONS	2017 PHASE I ESA[4]	SUMMARY OF INVESTIGATIONS	FINDINGS/STATUS	ADDITIONAL INVESTIGATION REQUIRED	2019 SITE INVESTIGATION ACTIVITIES	FINDINGS	RECOMMENDATIONS
Other Areas Identified (continued)															
N/A		N/A	Main Plant Ventilation Stack	Interim off-gas system used in 1973. Off-gas was passed through carbon in buried pipes west of the stack. System abandoned in place.	Not Discussed		42,000 pounds of activated carbon remains in buried pipes. Soil at the base of the stack has been amended by the addition of several tons of salt to increase conductivity and improve grounding of the lightning protection system.				Carbon contained in buried pipes. Removal to be addressed as part of the demolition activities.	No			No further action is recommended.
N/A		N/A	Concrete Batch Plant (south of cooling towers)	Used during plant construction. Area was used for construction demobilization and construction material staging.	Not Discussed		No evidence of the batch plant remained in 2014. Construction materials staged in this area was reportedly liquidated within approx. 2 years of plant start-up.				Plant no longer present. No evidence of a release.	No			No further action is recommended.
N/A		N/A	Area of Lead (is/was used)	Lead-based paint widely used during plant construction, and lead blankets and blocks used for shielding in parts of the Protected Area.	Not Discussed		Use of lead-based paint was not controlled prior to 1978. It was widely used during plant construction. Lead blankets and blocks used for shielding in parts of the Protected Area.				Hazardous building materials will be identified, characterized, remediated/removed and properly disposed of prior to demolition in accordance with specific Work Plans.	Will be addressed separately.			Hazardous building materials will be identified, characterized, remediated/removed and properly disposed of prior to demolition in accordance with specific Work Plans.
N/A		N/A	Areas where asbestos is/was used	Asbestos is present in pipe insulation on-site. Baffles in the cooling towers are comprised of asbestos containing material (ACM).	Not Discussed		A 1999 inventory of asbestos insulation at VYNPS identified 79,410 cubic feet of asbestos.				Hazardous building materials will be identified, characterized, remediated/removed and properly disposed of prior to demolition in accordance with specific Work Plans.	Will be addressed separately.			Hazardous building materials will be identified, characterized, remediated/removed and properly disposed of prior to demolition in accordance with specific Work Plans.
N/A		N/A	Areas where Mercury is/was used	Mercury is used in switches, gauges, and fluorescent bulbs throughout the plant.	Not Discussed		Various spills have been reported and cleaned up.				Spills were reportedly cleaned up. Spills requiring additional investigation have not been noted.	No			No further action is recommended.
N/A		N/A	Former Wood Burning Area	Located northwest of the 345 kV Switchyard, between the two railroad spurs	Although there was no evidence of current use, ash was observed in the grass.	Yes, Phase II sampling performed	No evidence of impacted soil; likely removed during construction of the VELCO switchyard. Area is no longer identifiable.			Two soil samples and a groundwater sample were collected in this area as part of the 2001 Phase II. Samples were analyzed for VOCs, TPH, PAHs, PCBs and 13 PP metals. Additionally, groundwater was analyzed for radiological parameters.	With the exception of Naphthalene (130 ug/kg) no VOCs, PAHs, TPH or PCBs were detected above MDLs in soil. Metal concentrations were within background ranges. In GW, no VOCs, TPH, PAHs, PCBs or dissolved metals were detected above MDLs.	Yes. Since area is part of active VELCO substation area, this AOC will be address in downgradient explorations performed while investigating other AOCs	Downgradient monitoring wells have been sampled and will continue to be sampled as part of the Groundwater Monitoring Program.	No significant groundwater impacts have been observed downgradient of this AOC.	Groundwater quality will continue to be monitored as part of the Groundwater Monitoring Program.
Other Near-by Properties															
N/A		N/A	Former Evelyn Edson Residence	298 Governor Hunt Road	Not owned by Entergy at the time of the June 2001 Phase I/II.		May 1, 2014 inspection: site is occupied by the Town of Vernon and used as their emergency response center. Two 120-gallon propane tanks (fabricated in 2012) on concrete pads at southeast exterior corner of house. (1) 275-gallon fuel oil tank in basement. Suspected asbestos floor tiles in south room in basement. No visible indications of spills or leaks.	Phase I ESA completed November 6, 2009 prior to purchase by Entergy. No Recognized Environmental Conditions (RECs) identified.				No.			No further action is recommended.
N/A		N/A	Former Lagro Property/White House ("Double Wide")	394-396 Governor Hunt Road, VYNPS Environmental Facility	Not owned by Entergy at the time of the June 2001 Phase I/II.		May 1, 2014 inspection: the "Double Wide" is used by the VYNPS Environmental Program and Radiological Environmental Monitoring Program (REMP) for offices and environmental sample processing. One 275-gallon fuel oil AST is in the basement. One pad-mounted transformer is on north side of driveway. No visible indications of spills or leaks.	Phase I ESA completed May 19, 2008 prior to purchase by Entergy. Two residences (394 and 396) formerly existed on the property; only the house at 394 Governor Hunt Road ("Double Wide") remains. Two vehicles burned at the site in approximately 1996-1998. A 275-gallon kerosene UST was removed from the trailer at 396 Governor Hunt Road in October 1999. No UST closure report is available. No other issues indicating a risk to soil or groundwater identified.			No RECs identified	No.			No further action is recommended.
N/A		N/A	Former Zaluzny Residence	422 Governor Hunt Road	Not owned by Entergy at the time of the June 2001 Phase I/II.		May 1, 2014 inspection identified portable light towers and generators stored in the garage by VYNPS Maintenance. One 275-gallon fuel oil AST in basement. No visible indications of spills or leaks.	Phase I ESA completed February 16, 2012 prior to purchase by Entergy; 2,000-gallon fuel oil UST removed from south side of residence January 30, 2012; tank did not leak; no Recognized Environmental Conditions.			No RECs identified	No.			No further action is recommended.
N/A		N/A	Land between Plant Fence & Entergy Fence on east side of Governor Hunt Road	Behind properties on east side of Governor Hunt Road	Not discussed		Leased to local farmer for hay fields				No RECs identified	No.			No further action is recommended.

Notes:
1. Areas of concern (AOCs) compiled from several sources including the 2014 HAS by RCSC, 2001 Phase I and II ESA by ECS, 2017 Phase I by Normandeau Assoc. and H&A
2. Source: "Phase I and II Environmental Site Assessment" prepared on 4 June 2001 by Environmental Compliance Services, Inc.
3. Source: "Non-Radiological Historical Site Assessment" prepared September 2017 by Radiation safety & Control Services
4. Source: "Phase I Environmental Site Assessment Report" prepared 9 August 2017 by Normandeau Associates.
5. Source: "Final North Warehouse Soil Characterization Report, Revision 1" prepared on 8 August 2017 by Haley & Aldrich, Inc.
6. Results of radiological analyses are not discussed in this report or included in this AOC table.
7. MDLs: Analytical Laboratory Method Detection Limits

FIGURES



MAP SOURCE: ESRI
USGS QUAD: BRATTLEBORO, VERMONT
SITE COORDINATES: 42°46'44"N, 72°30'48"W

HALEY ALDRICH

VERMONT YANKEE NUCLEAR POWER STATION
320 GOVERNOR HUNT ROAD
VERNON, VERMONT

PROJECT LOCUS

APPROXIMATE SCALE: 1 IN = 2000 FT
JULY 2019

FIGURE 1-1

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NOTE

AERIAL IMAGERY SOURCE: ESRI

0 200 400
SCALE IN FEET

HALEY ALDRICH

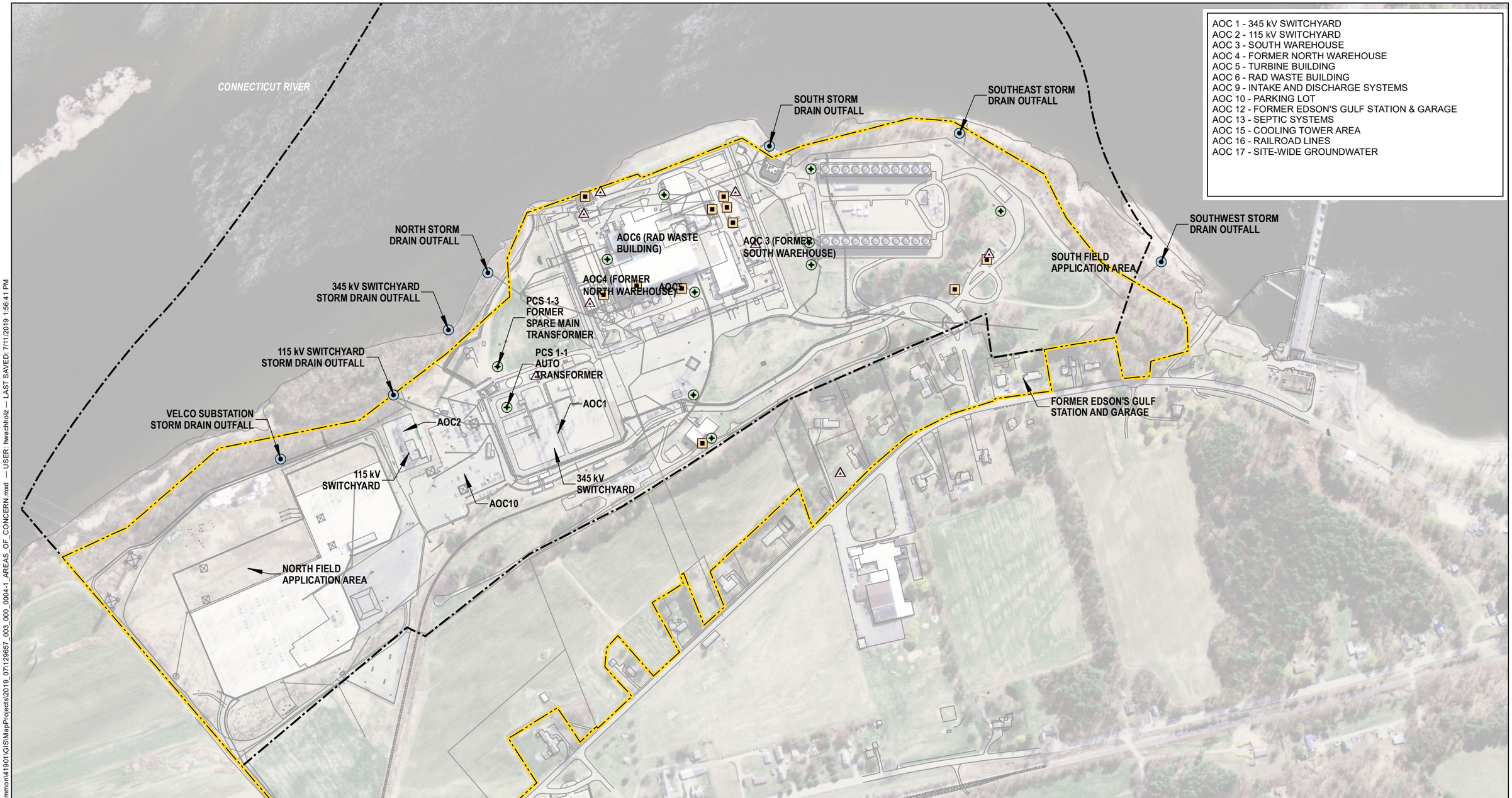
VERMONT YANKEE NUCLEAR POWER STATION
320 GOVERNOR HUNT ROAD
VERNON, VERMONT

CURRENT SITE CONDITIONS

JULY 2019

FIGURE 1-2

GIS FILE PATH: \\haleyaldrich.com\share\bos_common\41901\GIS\MapProjects\2019_07\41901_000_001-2_CURRENT_SITE_CONDITIONS.mxd — USER: hwachholz — LAST SAVED: 7/8/2019 12:30:52 PM



AOC 1 - 345 kV SWITCHYARD
AOC 2 - 115 kV SWITCHYARD
AOC 3 - SOUTH WAREHOUSE
AOC 4 - FORMER NORTH WAREHOUSE
AOC 5 - TURBINE BUILDING
AOC 6 - RAD WASTE BUILDING
AOC 9 - INTAKE AND DISCHARGE SYSTEMS
AOC 10 - PARKING LOT
AOC 12 - FORMER EDSON'S GULF STATION & GARAGE
AOC 13 - SEPTIC SYSTEMS
AOC 15 - COOLING TOWER AREA
AOC 16 - RAILROAD LINES
AOC 17 - SITE-WIDE GROUNDWATER

LEGEND

AREAS OF CONCERN

- AOC 7 - FUEL OIL STORAGE TANK
- AOC 8 - TRANSFORMER (OUTSIDE BUILDINGS)
- AOC 11 - HAZARDOUS MATERIALS/WASTE STORAGE AREA (NON-RAD)
- AOC 14 - STORMWATER OUTFALL
- EXCLUSION AREA
- SITE BOUNDARY

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. BASE MAP SOURCE: VERMONT YANKEE NUCLEAR POWER STATION
3. AERIAL IMAGERY SOURCE: ESRI

0 400 800
SCALE IN FEET

HALEY ALDRICH

VERMONT YANKEE NUCLEAR POWER STATION
320 GOVERNOR HUNT ROAD
VERNON, VERMONT

AREAS OF CONCERN

JULY 2019

FIGURE 4-1

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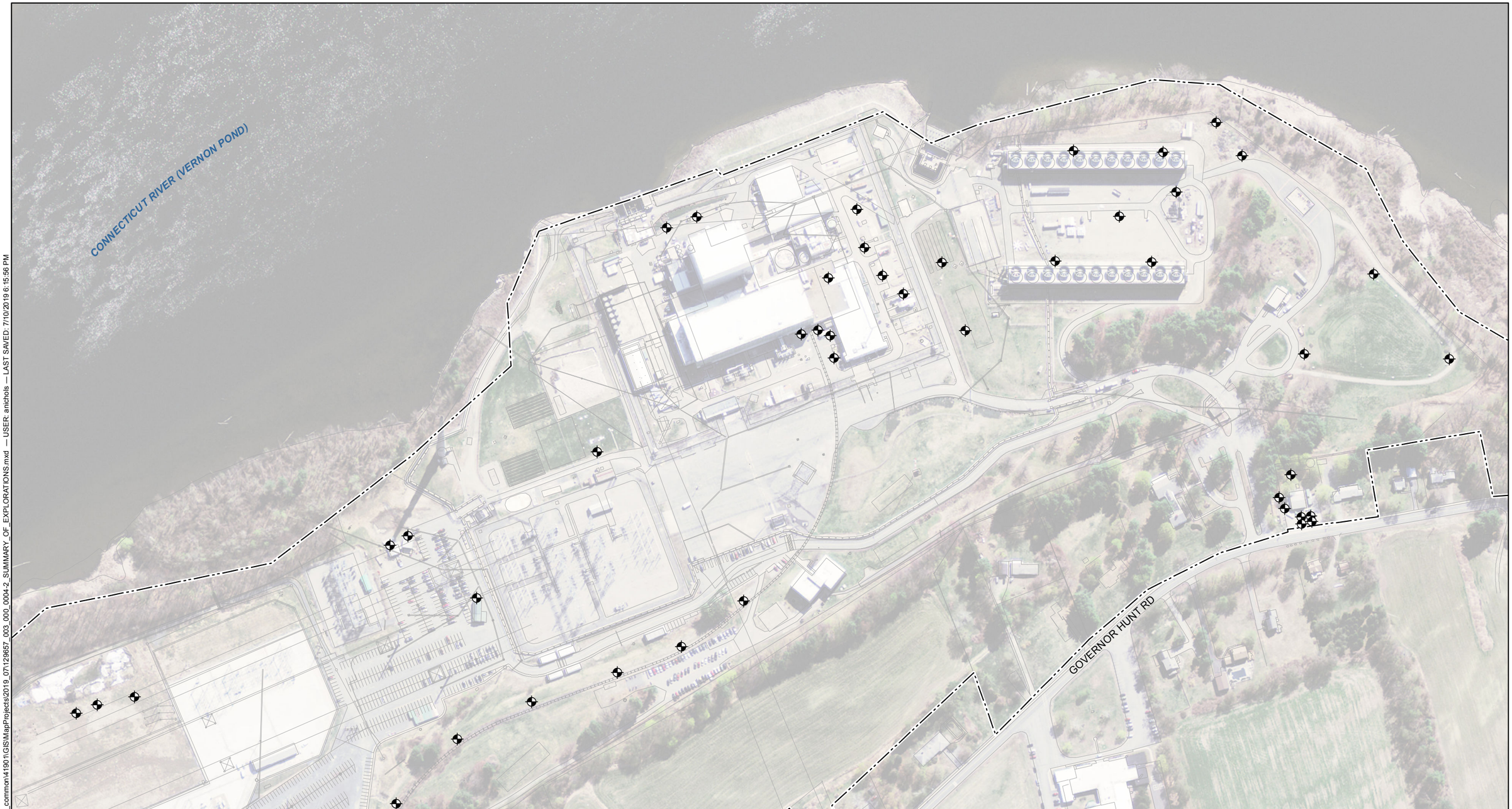


LEGEND

ACTUAL SAMPLED LOCATION

SITE BOUNDARY

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.

2. BASE MAP SOURCE: VERMONT YANKEE NUCLEAR POWER STATION

3. WELL LOCATION DATA SOURCE: PLAN TITLED, "SITE PLAN SHOWING EXPLORATION LOCATIONS, FIGURE 1.2", PREPARED BY GZA GEOENVIRONMENTAL, INC., MAY 2011.

4. AERIAL IMAGERY SOURCE: ESRI

N

0 250 500

SCALE IN FEET

HALEY ALDRICH

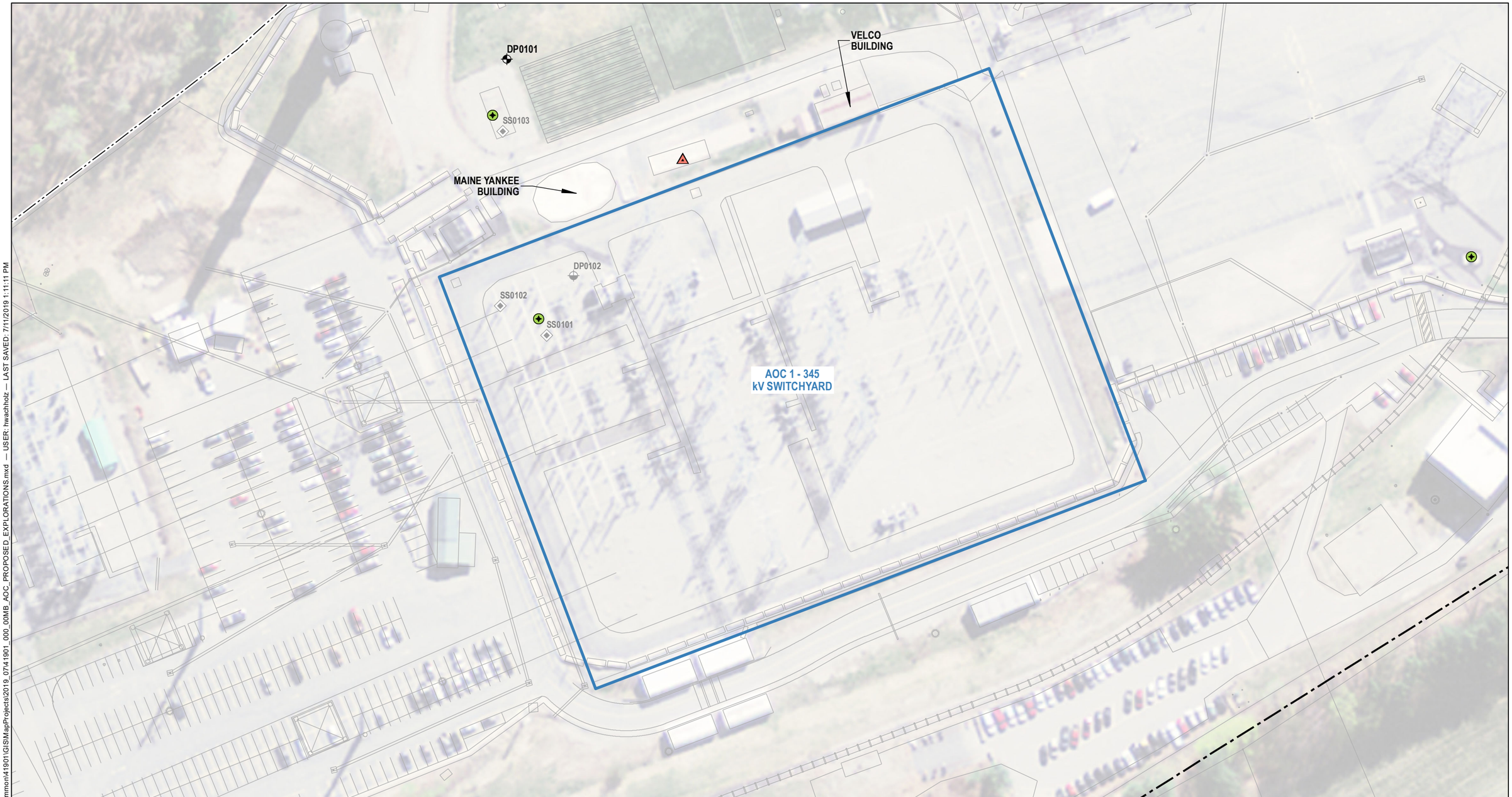
VERMONT YANKEE NUCLEAR POWER STATION
320 GOVERNOR HUNT ROAD
VERNON, VERMONT

SUMMARY OF EXPLORATIONS

JULY 2019

FIGURE 4-2

GIS FILE PATH: \\haleyaldrich.com\shares\bos_common\41190\1\GIS\MapProjects\2019_07\129657_003_000_0004-2_SUMMARY_OF_EXPLORATIONS.mxd — USER: anichols — LAST SAVED: 7/10/2019 6:15:56 PM



LEGEND

- ACTUAL SAMPLED LOCATION
- SITE BOUNDARY
- EXCLUSION AREA
- AOC 8 - TRANSFORMER (OUTSIDE BUILDINGS)
- AOC 11 - HAZARDOUS MATERIALS/WASTE STORAGE AREA (NON-RAD)
- LIMIT OF AREA OF CONCERN (AOC)

NOTES

1. PCS = POTENTIAL CONTAMINANT SOURCE
2. AERIAL IMAGERY SOURCE: ESRI

0 80 160
SCALE IN FEET

HALEY ALDRICH

VERMONT YANKEE NUCLEAR POWER STATION
320 GOVERNOR HUNT ROAD
VERNON, VERMONT

AOC 1: 345 KV SWITCHYARD: SAMPLING LOCATIONS

JULY 2019

FIGURE 5.1-1

GIS FILE PATH: \\haleyaldrich.com\share\bos_common\41901\GIS\MapProjects\2019_07\41901_000_00MB_AOC_PROPOSED_EXPLORATIONS.mxd — USER: hwachholz — LAST SAVED: 7/11/2019 1:11:11 PM

DP0101

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	0-1	0.0067 U
	18-20	0.0047 U
Thallium	0-1	1.1 U
	18-20	1 U
Vanadium	0-1	20.9
	18-20	13.5

LEGEND

- ACTUAL SAMPLED LOCATION
- SOIL ANALYTICAL RESULTS EXCEEDING RESIDENTIAL AND NON-RESIDENTIAL SOIL CRITERIA
- SITE BOUNDARY
- EXCLUSION AREA
- AOC 8 - TRANSFORMER (OUTSIDE BUILDINGS)
- AOC 11 - HAZARDOUS MATERIALS/WASTE STORAGE AREA (NON-RAD)
- LIMIT OF AREA OF CONCERN (AOC)

NOTES

1. U = NOT DETECTED, VALUE IS THE LABORATORY REPORTING LIMIT

2. AERIAL IMAGERY SOURCE: ESRI

0 80 160
SCALE IN FEET

HALEY ALDRICH

VERMONT YANKEE NUCLEAR POWER STATION
320 GOVERNOR HUNT ROAD
VERNON, VERMONT

AOC 1: 345 KV SWITCHYARD: SOIL ANALYTICAL RESULTS EXCEEDING RESIDENTIAL AND NON-RESIDENTIAL SOIL STANDARDS

JULY 2019

FIGURE 5.1-2

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LEGEND

SITE BOUNDARY

EXCLUSION AREA

LIMIT OF AREA OF CONCERN (AOC)

NOTES

1. PCS = POTENTIAL CONTAMINANT SOURCE

2. GRAY SAMPLING LOCATIONS WILL BE SAMPLED AT A LATER DATE.

3. AERIAL IMAGERY SOURCE: ESRI

0 40 80

SCALE IN FEET

HALEY ALDRICH

VERMONT YANKEE NUCLEAR POWER STATION
320 GOVERNOR HUNT ROAD
VERNON, VERMONT

AOC 2: 115 KV SWITCHYARD:
SAMPLING LOCATIONS

JULY 2019

FIGURE 5.2-1

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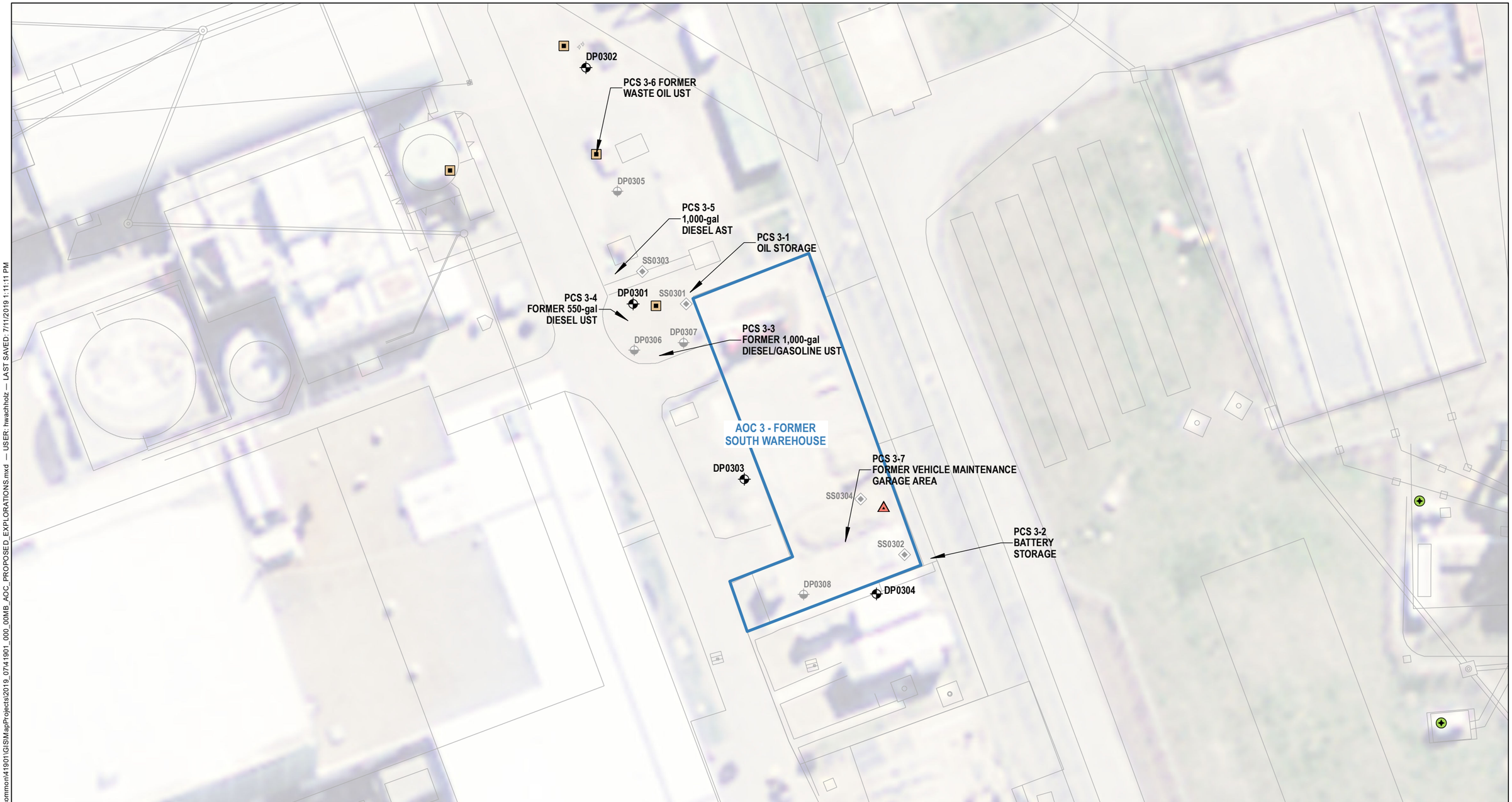

LEGEND

- ACTUAL SAMPLED LOCATION
- SITE BOUNDARY
- EXCLUSION AREA
- AOC 7 - FUEL OIL STORAGE TANK
- AOC 11 - HAZARDOUS MATERIALS/WASTE STORAGE AREA (NON-RAD)
- LIMIT OF AREA OF CONCERN (AOC)

NOTES

1. PCS = POTENTIAL CONTAMINANT SOURCE
2. AERIAL IMAGERY SOURCE: ESRI

0 40 80
SCALE IN FEET

HALEY ALDRICH

VERMONT YANKEE NUCLEAR POWER STATION
320 GOVERNOR HUNT ROAD
VERNON, VERMONT

AOC 3: FORMER SOUTH WAREHOUSE: SAMPLING LOCATIONS

JULY 2019

FIGURE 5.3-1

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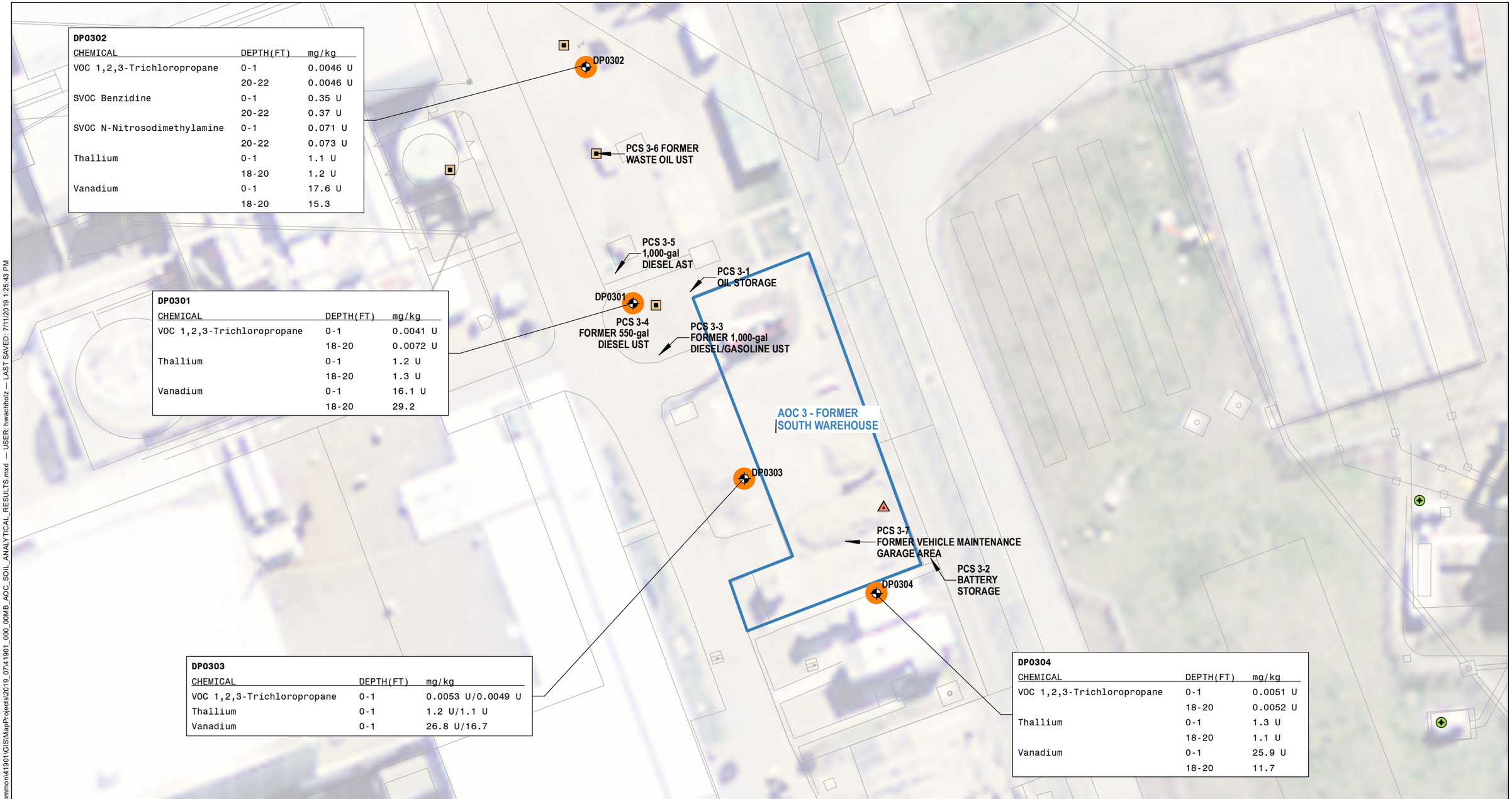

DP0302

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	0-1	0.0046 U
	20-22	0.0046 U
SVOC Benzidine	0-1	0.35 U
	20-22	0.37 U
SVOC N-Nitrosodimethylamine	0-1	0.071 U
	20-22	0.073 U
Thallium	0-1	1.1 U
	18-20	1.2 U
Vanadium	0-1	17.6 U
	18-20	15.3

DP0301

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	0-1	0.0041 U
	18-20	0.0072 U
Thallium	0-1	1.2 U
	18-20	1.3 U
Vanadium	0-1	16.1 U
	18-20	29.2

DP0303

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	0-1	0.0053 U/0.0049 U
Thallium	0-1	1.2 U/1.1 U
Vanadium	0-1	26.8 U/16.7

DP0304

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	0-1	0.0051 U
	18-20	0.0052 U
Thallium	0-1	1.3 U
	18-20	1.1 U
Vanadium	0-1	25.9 U
	18-20	11.7

LEGEND

- ACTUAL SAMPLED LOCATION
- SOIL ANALYTICAL RESULTS EXCEEDING RESIDENTIAL AND NON-RESIDENTIAL SOIL CRITERIA
- SITE BOUNDARY
- EXCLUSION AREA
- AOC 7 - FUEL OIL STORAGE TANK
- AOC 8 - TRANSFORMER (OUTSIDE BUILDINGS)
- AOC 11 - HAZARDOUS MATERIALS/WASTE STORAGE AREA (NON-RAD)
- LIMIT OF AREA OF CONCERN (AOC)

NOTES

1. U = NOT DETECTED, VALUE IS THE LABORATORY REPORTING LIMIT
2. / = DUPLICATE RESULT (PRIMARY/SECONDARY)
3. AERIAL IMAGERY SOURCE: ESRI

0 40 80
SCALE IN FEET

HALEY ALDRICH

VERMONT YANKEE NUCLEAR POWER STATION
320 GOVERNOR HUNT ROAD
VERNON, VERMONT

AOC 3: FORMER SOUTH WAREHOUSE: SOIL ANALYTICAL RESULTS EXCEEDING RESIDENTIAL AND NON-RESIDENTIAL SOIL STANDARDS

JULY 2019

FIGURE 5.3-2

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LEGEND

- SITE BOUNDARY
- EXCLUSION AREA
- AOC 7 - FUEL OIL STORAGE TANK
- AOC 8 - TRANSFORMER (OUTSIDE BUILDINGS)
- AOC 11 - HAZARDOUS MATERIALS/WASTE STORAGE AREA (NON-RAD)
- LIMIT OF AREA OF CONCERN (AOC)

NOTES

1. PCS = POTENTIAL CONTAMINANT SOURCE
2. AERIAL IMAGERY SOURCE: ESRI

0 40 80
SCALE IN FEET

HALEY ALDRICH

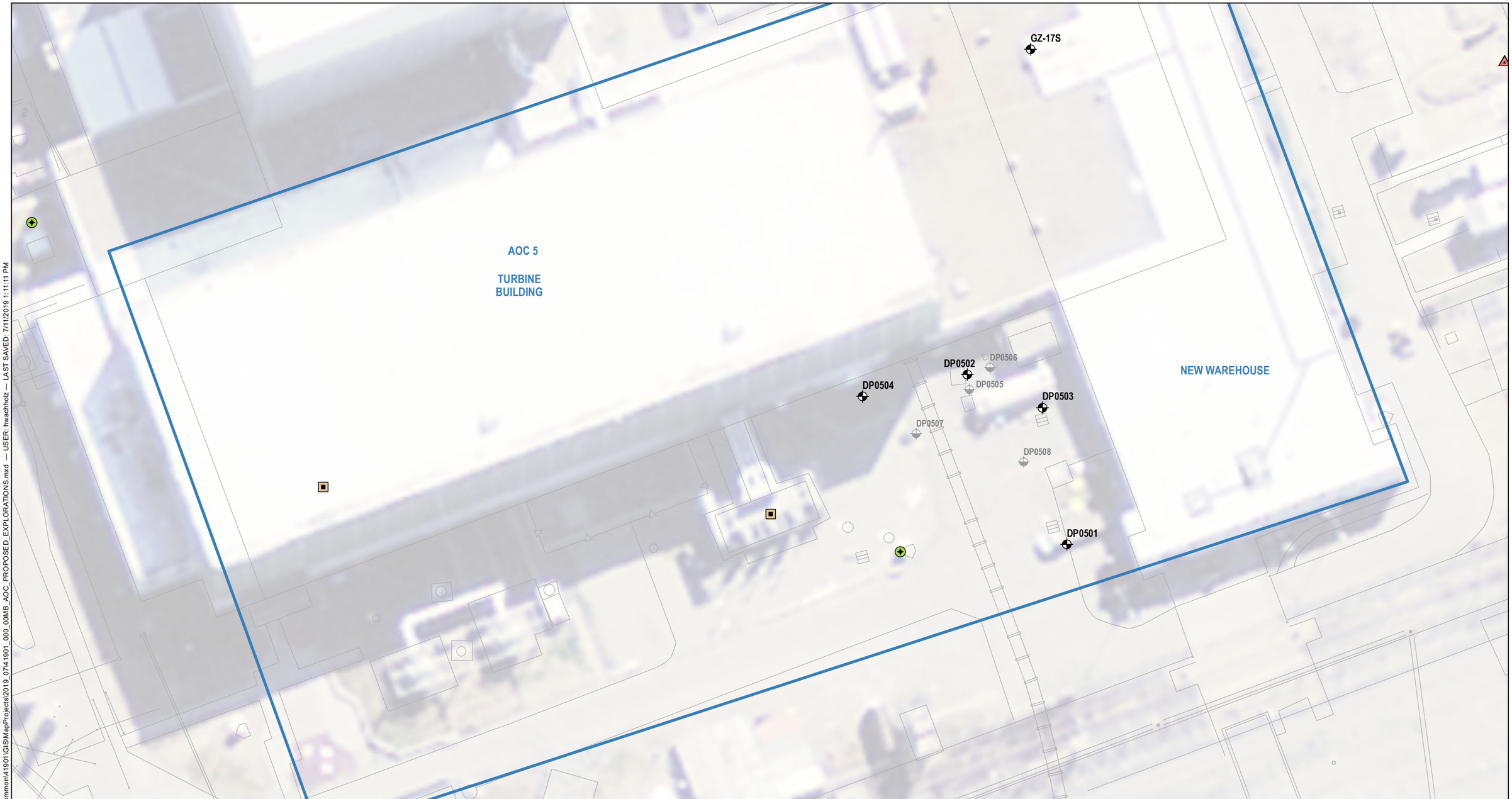
VERMONT YANKEE NUCLEAR POWER STATION
320 GOVERNOR HUNT ROAD
VERNON, VERMONT

AOC 4: FORMER NORTH WAREHOUSE: SAMPLING LOCATIONS

JULY 2019

FIGURE 5.4-1

GIS FILE PATH: \\haleyaldrich.com\share\bos_common\41901\GIS\MapProjects\2019_07\41901_000_00MB_AOC_PROPOSED_EXPLORATIONS.mxd — USER: hwachholz — LAST SAVED: 7/11/2019 1:11:11 PM



LEGEND

- ACTUAL SAMPLED LOCATION
- SITE BOUNDARY
- EXCLUSION AREA
- AOC 7 - FUEL OIL STORAGE TANK
- AOC 8 - TRANSFORMER (OUTSIDE BUILDINGS)
- AOC 11 - HAZARDOUS MATERIALS/WASTE STORAGE AREA (NON-RAD)
- LIMIT OF AREA OF CONCERN (AOC)

NOTES

1. PCS = POTENTIAL CONTAMINANT SOURCE
2. AERIAL IMAGERY SOURCE: ESRI

0 40 80
SCALE IN FEET

HALEY ALDRICH

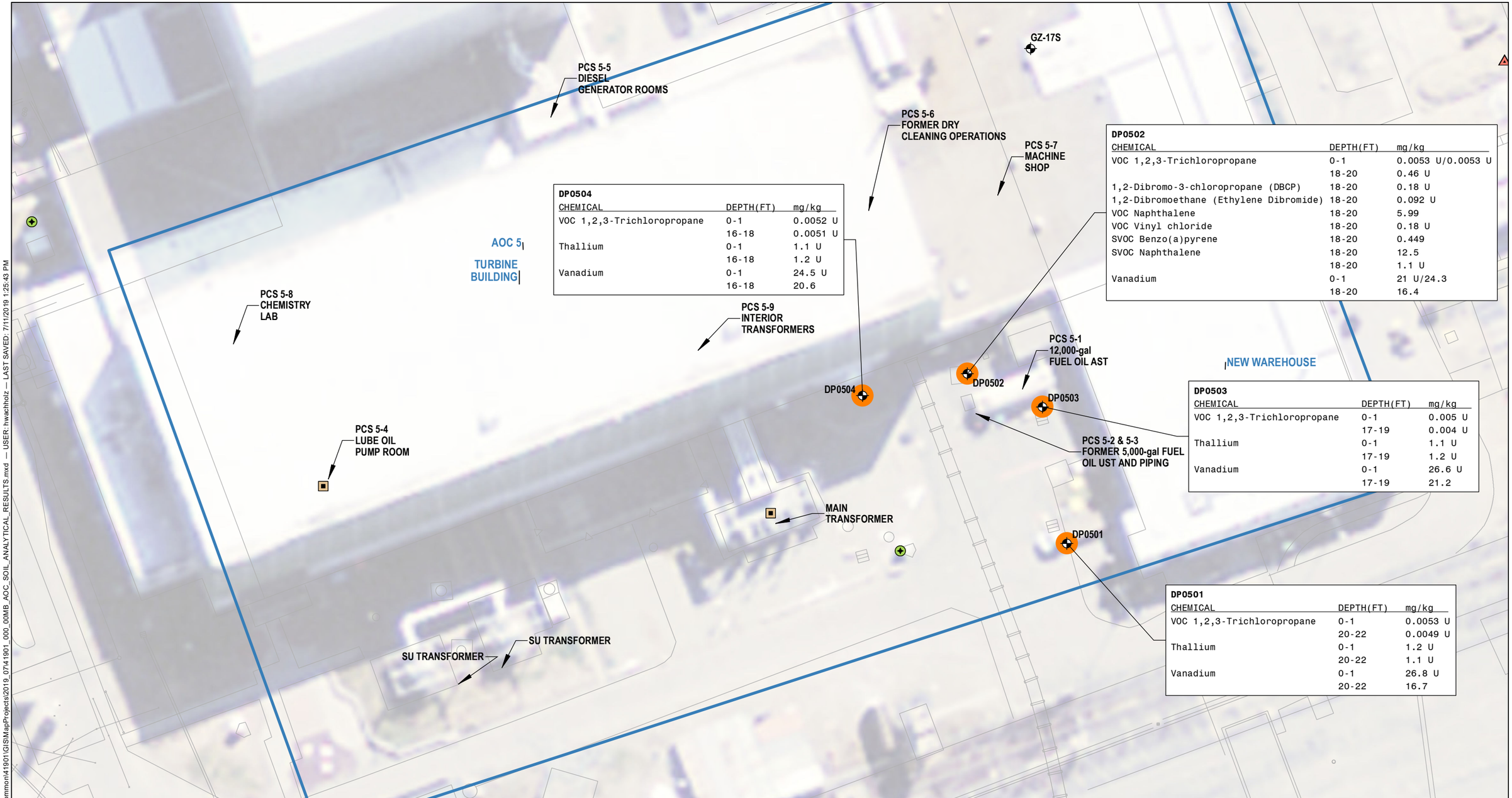
VERMONT YANKEE NUCLEAR POWER STATION
320 GOVERNOR HUNT ROAD
VERNON, VERMONT

AOC 5: TURBINE BUILDING:
SAMPLING LOCATIONS

JULY 2019

FIGURE 5.5-1

GIS FILE PATH: \\haleyaldrich.com\share\bos_common\41901\GIS\MapProjects\2019_07\41901_000_00MB_AOC_PROPOSED_EXPLORATIONS.mxd — USER: hwachholz — LAST SAVED: 7/11/2019 1:11:11 PM



DP0504

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	0-1	0.0052 U
	16-18	0.0051 U
Thallium	0-1	1.1 U
	16-18	1.2 U
Vanadium	0-1	24.5 U
	16-18	20.6

DP0502

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	0-1	0.0053 U/0.0053 U
	18-20	0.46 U
1,2-Dibromo-3-chloropropane (DBCP)	18-20	0.18 U
1,2-Dibromoethane (Ethylene Dibromide)	18-20	0.092 U
VOC Naphthalene	18-20	5.99
VOC Vinyl chloride	18-20	0.18 U
SVOC Benzo(a)pyrene	18-20	0.449
SVOC Naphthalene	18-20	12.5
	18-20	1.1 U
Vanadium	0-1	21 U/24.3
	18-20	16.4

DP0503

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	0-1	0.005 U
	17-19	0.004 U
Thallium	0-1	1.1 U
	17-19	1.2 U
Vanadium	0-1	26.6 U
	17-19	21.2

DP0501

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	0-1	0.0053 U
	20-22	0.0049 U
Thallium	0-1	1.2 U
	20-22	1.1 U
Vanadium	0-1	26.8 U
	20-22	16.7

LEGEND

- ACTUAL SAMPLED LOCATION
- SOIL ANALYTICAL RESULTS EXCEEDING RESIDENTIAL AND NON-RESIDENTIAL SOIL CRITERIA
- SITE BOUNDARY
- EXCLUSION AREA
- AOC 7 - FUEL OIL STORAGE TANK
- AOC 8 - TRANSFORMER (OUTSIDE BUILDINGS)
- AOC 11 - HAZARDOUS MATERIALS/WASTE STORAGE AREA (NON-RAD)
- LIMIT OF AREA OF CONCERN (AOC)

NOTES

1. U = NOT DETECTED, VALUE IS THE LABORATORY REPORTING LIMIT
2. / = DUPLICATE RESULT (PRIMARY/SECONDARY)
3. AERIAL IMAGERY SOURCE: ESRI

0 40 80
SCALE IN FEET

HALEY ALDRICH

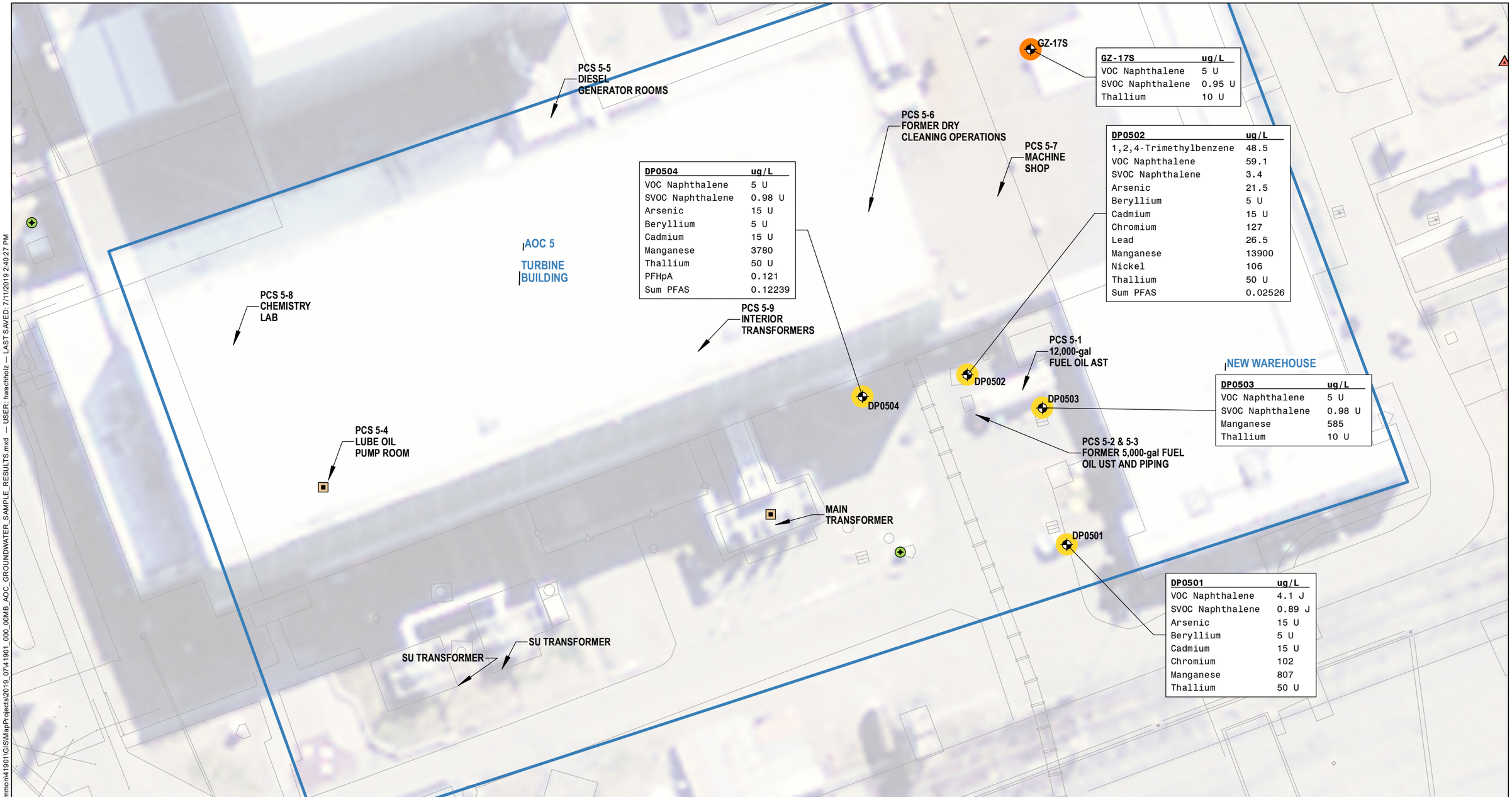
VERMONT YANKEE NUCLEAR POWER STATION
320 GOVERNOR HUNT ROAD
VERNON, VERMONT

AOC 5: TURBINE BUILDING: SOIL ANALYTICAL RESULTS EXCEEDING RESIDENTIAL AND NON-RESIDENTIAL SOIL STANDARDS

JULY 2019

FIGURE 5.5-2

GIS FILE PATH: \\haleyaldrich.com\share\bos_common\419011\GIS\MapProjects\2019_07\41901_000_00MB_AOC_SOIL_ANALYTICAL_RESULTS.mxd — USER: hwachholz — LAST SAVED: 7/11/2019 1:25:43 PM



GZ-17S	ug/L
VOC Naphthalene	5 U
SVOC Naphthalene	0.95 U
Thallium	10 U

DP0502	ug/L
1,2,4-Trimethylbenzene	48.5
VOC Naphthalene	59.1
SVOC Naphthalene	3.4
Arsenic	21.5
Beryllium	5 U
Cadmium	15 U
Chromium	127
Lead	26.5
Manganese	13900
Nickel	106
Thallium	50 U
Sum PFAS	0.02526

DP0504	ug/L
VOC Naphthalene	5 U
SVOC Naphthalene	0.98 U
Arsenic	15 U
Beryllium	5 U
Cadmium	15 U
Manganese	3780
Thallium	50 U
PFHpA	0.121
Sum PFAS	0.12239

DP0503	ug/L
VOC Naphthalene	5 U
SVOC Naphthalene	0.98 U
Manganese	585
Thallium	10 U

DP0501	ug/L
VOC Naphthalene	4.1 J
SVOC Naphthalene	0.89 J
Arsenic	15 U
Beryllium	5 U
Cadmium	15 U
Chromium	102
Manganese	807
Thallium	50 U

LEGEND

- ACTUAL SAMPLED LOCATION
- GROUNDWATER DATA FROM MONITORING WELLS EXCEEDING THE VT GES
- GROUNDWATER GRAB DATA FROM OPEN BORINGS EXCEEDING THE VT GES
- SITE BOUNDARY
- EXCLUSION AREA
- AOC 7 - FUEL OIL STORAGE TANK
- AOC 8 - TRANSFORMER (OUTSIDE BUILDINGS)
- AOC 11 - HAZARDOUS MATERIALS/WASTE STORAGE AREA (NON-RAD)
- LIMIT OF AREA OF CONCERN (AOC)

NOTES

1. PCS = POTENTIAL CONTAMINANT SOURCE
2. VT GES = VERMONT GROUNDWATER ENFORCEMENT STANDARDS
3. U = NOT DETECTED, VALUE IS THE LABORATORY REPORTING LIMIT
4. J = ESTIMATED VALUE
5. AERIAL IMAGERY SOURCE: ESRI 2015

0 40 80
SCALE IN FEET

HALEY ALDRICH

VERMONT YANKEE NUCLEAR POWER STATION
320 GOVERNOR HUNT ROAD
VERNON, VERMONT

AOC 5: TURBINE BUILDING GROUNDWATER ANALYTICAL RESULTS EXCEEDING GROUNDWATER ENFORCEMENT STANDARDS

JULY 2019

FIGURE 5.5-3

GIS FILE PATH: \\haleyaldrich.com\share\bos_common\41901\GIS\MapProjects\2019_07\41901_000_00MB_AOC_GROUNDWATER_SAMPLE_RESULTS.mxd — USER: hwachholz — LAST SAVED: 7/11/2019 2:40:27 PM

LEGEND

- ACTUAL SAMPLED LOCATION
- SITE BOUNDARY
- EXCLUSION AREA
- AOC 8 - TRANSFORMER (OUTSIDE BUILDINGS)
- AOC 11 - HAZARDOUS MATERIALS/WASTE STORAGE AREA (NON-RAD)
- LIMIT OF AREA OF CONCERN (AOC)

NOTES

1. PCS = POTENTIAL CONTAMINANT SOURCE
2. AERIAL IMAGERY SOURCE: ESRI

0 30 60
SCALE IN FEET

HALEY ALDRICH

VERMONT YANKEE NUCLEAR POWER STATION
320 GOVERNOR HUNT ROAD
VERNON, VERMONT

AOC 6: RADIOLOGICAL WASTE BUILDING & TANKS: SAMPLING LOCATIONS

JULY 2019

FIGURE 5.6-1

GIS FILE PATH: \\haleyaldrich.com\share\bos_common\41901\GIS\MapProjects\2019_07\41901_000_00MB_AOC_PROPOSED_EXPLORATIONS.mxd — USER: hwachholz — LAST SAVED: 7/11/2019 1:11:11 PM

DP0601

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	0-1	0.006 U
	22-23	0.0053 U
SVOC Benzidine	0-1	0.37 U
	22-23	0.35 U
SVOC N-Nitrosodimethylamine	0-1	0.073 U
	22-23	0.071 U
Thallium	0-1	1.1 U
	22-23	1.1 U
Vanadium	0-1	17.5 U
	22-23	19.5

DP0602

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	0-1	0.0044 U
	22-23	0.0048 U
SVOC Benzidine	0-1	0.35 U
	22-23	0.37 U
SVOC N-Nitrosodimethylamine	0-1	0.07 U
	22-23	0.075 U
Thallium	0-1	1.1 U
	22-23	1.2 U
Vanadium	0-1	28.2 U
	22-23	21.2

LEGEND

- ACTUAL SAMPLED LOCATION
- SOIL ANALYTICAL RESULTS EXCEEDING RESIDENTIAL AND NON-RESIDENTIAL SOIL CRITERIA
- SITE BOUNDARY
- EXCLUSION AREA
- AOC 8 - TRANSFORMER (OUTSIDE BUILDINGS)
- AOC 11 - HAZARDOUS MATERIALS/WASTE STORAGE AREA (NON-RAD)
- LIMIT OF AREA OF CONCERN (AOC)

NOTES

1. U = NOT DETECTED, VALUE IS THE LABORATORY REPORTING LIMIT

2. AERIAL IMAGERY SOURCE: ESRI

0 30 60
SCALE IN FEET

HALEY ALDRICH

VERMONT YANKEE NUCLEAR POWER STATION
320 GOVERNOR HUNT ROAD
VERNON, VERMONT

AOC 6: RADIOLOGICAL WASTE BUILDING & TANKS: SOIL ANALYTICAL RESULTS EXCEEDING RESIDENTIAL AND NON-RESIDENTIAL SOIL STANDARDS

JULY 2019

FIGURE 5.6-2

GIS FILE PATH: \\haleyaldrich.com\share\bos_common\41901\GIS\MapProjects\2019_0741901_000_00MB_AOC_SOIL_ANALYTICAL_RESULTS.mxd — USER: hwachholz — LAST SAVED: 7/11/2019 1:25:43 PM

DP0601	ug/L
VOC Naphthalene	5 U
SVOC Naphthalene	0.95 U
Arsenic	66.5
Beryllium	5 U
Cadmium	15 U
Chromium	209
Lead	62.5
Manganese	28900
Nickel	222
Thallium	50 U

DP0602	ug/L
VOC Naphthalene	5 U
SVOC Naphthalene	0.95 U
Arsenic	54.5
Beryllium	5 U
Cadmium	15 U
Chromium	220
Lead	56
Manganese	32400
Nickel	229
Thallium	50 U

LEGEND

- ACTUAL SAMPLED LOCATION
- GROUNDWATER GRAB DATA FROM OPEN BORINGS EXCEEDING THE VT GES
- SITE BOUNDARY
- EXCLUSION AREA
- AOC 8 - TRANSFORMER (OUTSIDE BUILDINGS)
- AOC 11 - HAZARDOUS MATERIALS/WASTE STORAGE AREA (NON-RAD)
- LIMIT OF AREA OF CONCERN (AOC)

NOTES

1. PCS = POTENTIAL CONTAMINANT SOURCE
2. VT GES = VERMONT GROUNDWATER ENFORCEMENT STANDARDS
3. U = NOT DETECTED, VALUE IS THE LABORATORY REPORTING LIMIT
4. AERIAL IMAGERY SOURCE: ESRI 2015

0 30 60
SCALE IN FEET

HALEY ALDRICH

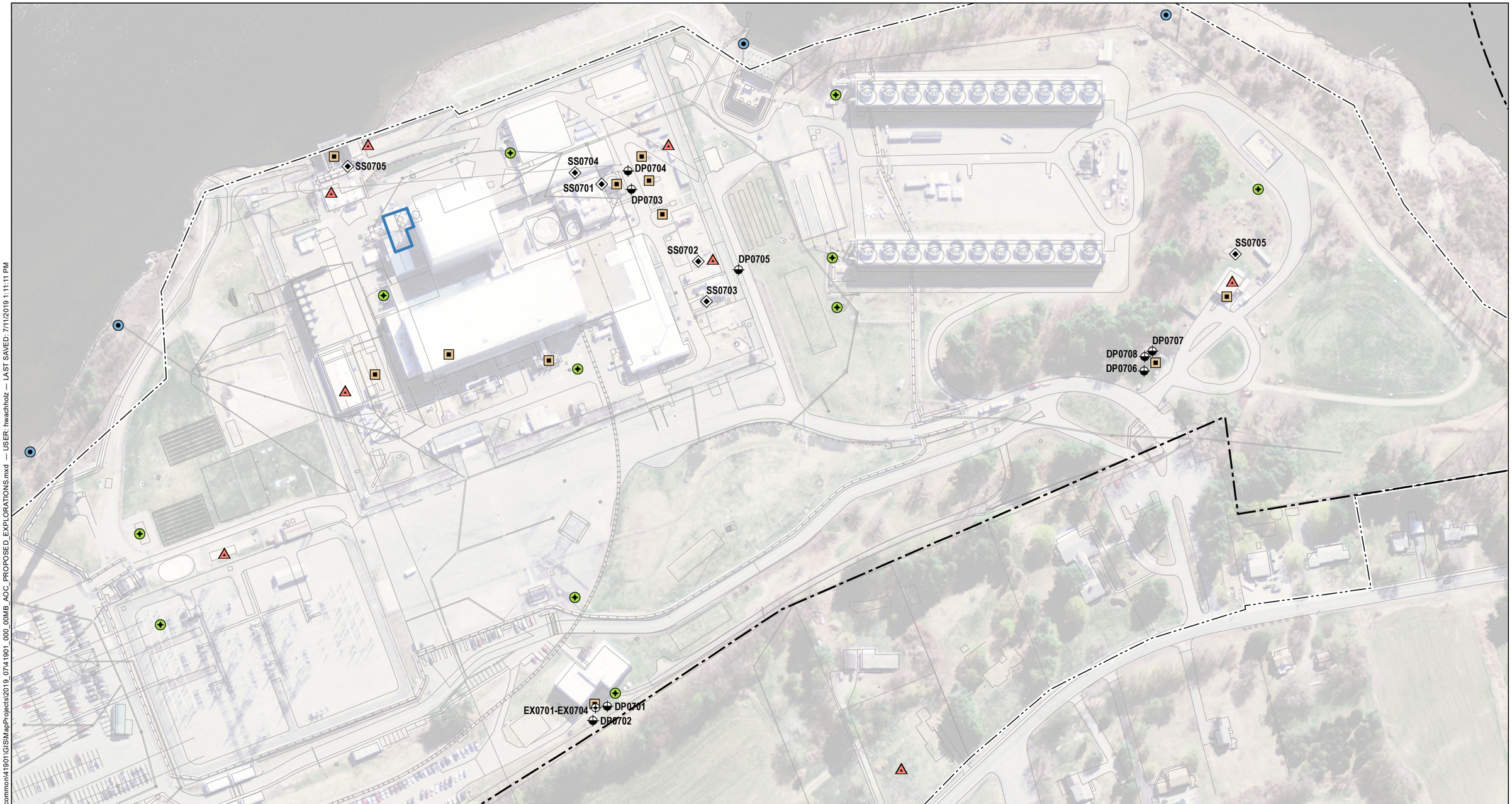
VERMONT YANKEE NUCLEAR POWER STATION
320 GOVERNOR HUNT ROAD
VERNON, VERMONT

AOC 6: RADIOLOGICAL WASTE BUILDING AND TANKS GROUNDWATER ANALYTICAL RESULTS EXCEEDING GROUNDWATER ENFORCEMENT STANDARDS

JULY 2019

FIGURE 5.6-3

GIS FILE PATH: \\haleyaldrich.com\share\bos_common\41901\GIS\MapProjects\2019_07\41901_000_00MB_AOC_GROUNDWATER_SAMPLE_RESULTS.mxd — USER: hwachholz — LAST SAVED: 7/11/2019 2:40:27 PM



LEGEND

- PROPOSED DIRECT PUSH SAMPLING LOCATION
- PROPOSED SOIL SAMPLING LOCATION
- PROPOSED EXCAVATION CONFIRMATION SAMPLING LOCATION
- SITE BOUNDARY
- EXCLUSION AREA
- AOC 7 - FUEL OIL STORAGE TANK
- AOC 8 - TRANSFORMER (OUTSIDE BUILDINGS)
- AOC 11 - HAZARDOUS MATERIALS/WASTE STORAGE AREA (NON-RAD)
- AOC 14 - STORMWATER OUTFALL
- LIMIT OF AREA OF CONCERN (AOC)

NOTES

1. PCS = POTENTIAL CONTAMINANT SOURCE
2. AERIAL IMAGERY SOURCE: ESRI

0 180 360
SCALE IN FEET

HALEY ALDRICH

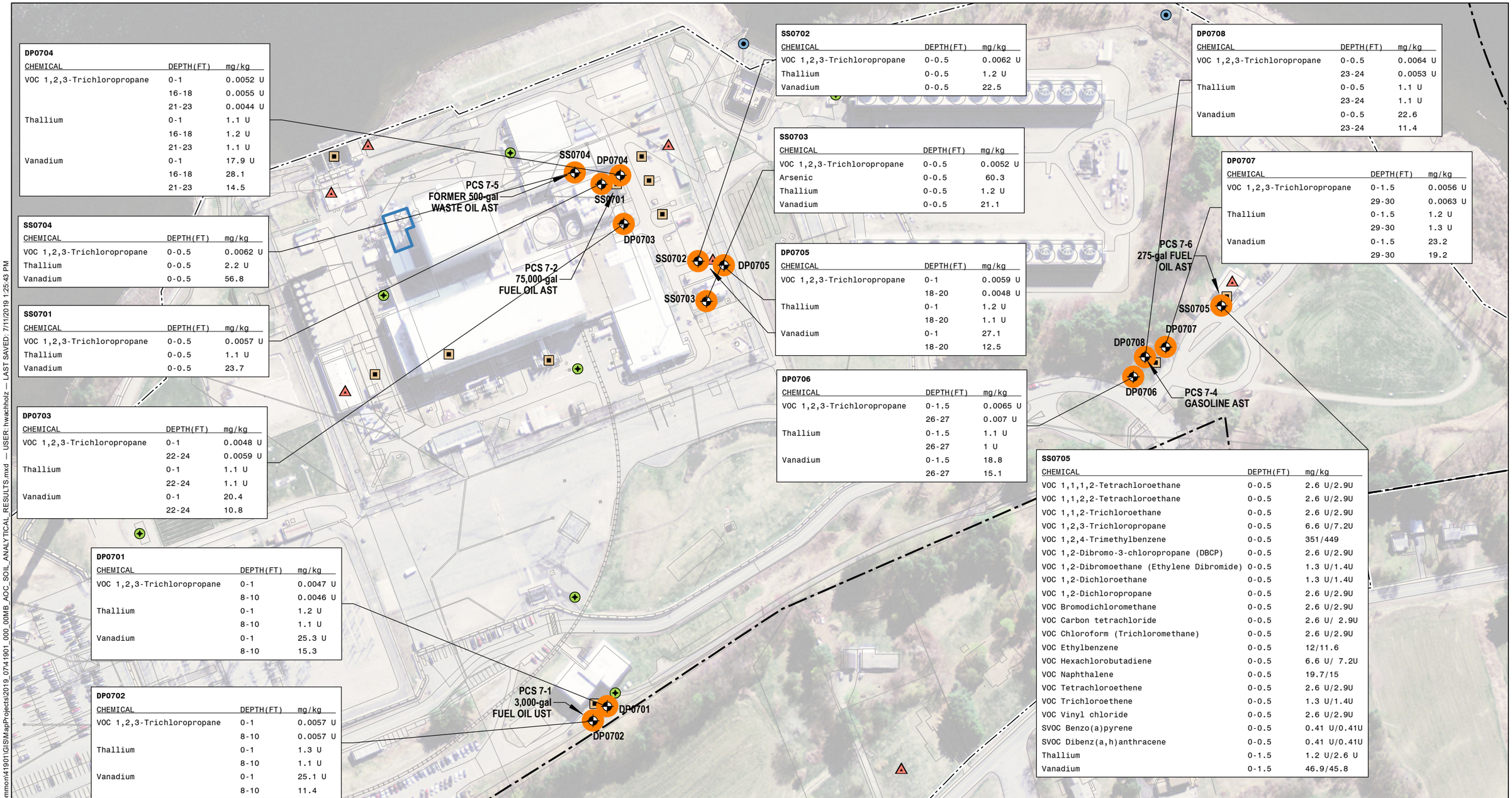
VERMONT YANKEE NUCLEAR POWER STATION
320 GOVERNOR HUNT ROAD
VERNON, VERMONT

AOC 7: FUEL STORAGE TANKS: SAMPLING LOCATIONS

JULY 2019

FIGURE 5.7-1

GIS FILE PATH: \\haleyaldrich.com\share\bos_common\41901\GIS\MapProjects\2019_0741901_000_00MB_AOC_PROPOSED_EXPLORATIONS.mxd — USER: hwachholz — LAST SAVED: 7/11/2019 1:11:11 PM



DP0704

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	0-1	0.0052 U
	16-18	0.0055 U
	21-23	0.0044 U
Thallium	0-1	1.1 U
	16-18	1.2 U
	21-23	1.1 U
Vanadium	0-1	17.9 U
	16-18	28.1
	21-23	14.5

SS0704

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	0-0.5	0.0062 U
Thallium	0-0.5	2.2 U
Vanadium	0-0.5	56.8

SS0701

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	0-0.5	0.0057 U
Thallium	0-0.5	1.1 U
Vanadium	0-0.5	23.7

DP0703

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	0-1	0.0048 U
	22-24	0.0059 U
Thallium	0-1	1.1 U
	22-24	1.1 U
Vanadium	0-1	20.4
	22-24	10.8

DP0701

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	0-1	0.0047 U
	8-10	0.0046 U
Thallium	0-1	1.2 U
	8-10	1.1 U
Vanadium	0-1	25.3 U
	8-10	15.3

DP0702

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	0-1	0.0057 U
	8-10	0.0057 U
Thallium	0-1	1.3 U
	8-10	1.1 U
Vanadium	0-1	25.1 U
	8-10	11.4

SS0702

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	0-0.5	0.0062 U
Thallium	0-0.5	1.2 U
Vanadium	0-0.5	22.5

SS0703

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	0-0.5	0.0052 U
Arsenic	0-0.5	60.3
Thallium	0-0.5	1.2 U
Vanadium	0-0.5	21.1

DP0705

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	0-1	0.0059 U
	18-20	0.0048 U
Thallium	0-1	1.2 U
	18-20	1.1 U
Vanadium	0-1	27.1
	18-20	12.5

DP0706

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	0-1.5	0.0065 U
	26-27	0.007 U
Thallium	0-1.5	1.1 U
	26-27	1 U
Vanadium	0-1.5	18.8
	26-27	15.1

DP0708

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	0-0.5	0.0064 U
	23-24	0.0053 U
Thallium	0-0.5	1.1 U
	23-24	1.1 U
Vanadium	0-0.5	22.6
	23-24	11.4

DP0707

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	0-1.5	0.0056 U
	29-30	0.0063 U
Thallium	0-1.5	1.2 U
	29-30	1.3 U
Vanadium	0-1.5	23.2
	29-30	19.2

SS0705

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,1,1,2-Tetrachloroethane	0-0.5	2.6 U/2.9U
VOC 1,1,2,2-Tetrachloroethane	0-0.5	2.6 U/2.9U
VOC 1,1,2-Trichloroethane	0-0.5	2.6 U/2.9U
VOC 1,2,3-Trichloropropane	0-0.5	6.6 U/7.2U
VOC 1,2,4-Trimethylbenzene	0-0.5	351/449
VOC 1,2-Dibromo-3-chloropropane (DBCP)	0-0.5	2.6 U/2.9U
VOC 1,2-Dibromoethane (Ethylene Dibromide)	0-0.5	1.3 U/1.4U
VOC 1,2-Dichloroethane	0-0.5	1.3 U/1.4U
VOC 1,2-Dichloropropane	0-0.5	2.6 U/2.9U
VOC Bromodichloromethane	0-0.5	2.6 U/2.9U
VOC Carbon tetrachloride	0-0.5	2.6 U/ 2.9U
VOC Chloroform (Trichloromethane)	0-0.5	2.6 U/2.9U
VOC Ethylbenzene	0-0.5	12/11.6
VOC Hexachlorobutadiene	0-0.5	6.6 U/ 7.2U
VOC Naphthalene	0-0.5	19.7/15
VOC Tetrachloroethene	0-0.5	2.6 U/2.9U
VOC Trichloroethene	0-0.5	1.3 U/1.4U
VOC Vinyl chloride	0-0.5	2.6 U/2.9U
SVOC Benzo(a)pyrene	0-0.5	0.41 U/0.41U
SVOC Dibenz(a,h)anthracene	0-0.5	0.41 U/0.41U
Thallium	0-1.5	1.2 U/2.6 U
Vanadium	0-1.5	46.9/45.8

LEGEND

- ACTUAL SAMPLED LOCATION
- SOIL ANALYTICAL RESULTS EXCEEDING RESIDENTIAL AND NON-RESIDENTIAL SOIL CRITERIA
- SITE BOUNDARY
- EXCLUSION AREA
- AOC 7 - FUEL OIL STORAGE TANK
- AOC 8 - TRANSFORMER (OUTSIDE BUILDINGS)
- AOC 11 - HAZARDOUS MATERIALS/WASTE STORAGE AREA (NON-RAD)
- AOC 14 - STORMWATER OUTFALL
- LIMIT OF AREA OF CONCERN (AOC)

NOTES

1. U = NOT DETECTED, VALUE IS THE LABORATORY REPORTING LIMIT
2. / = DUPLICATE RESULT (PRIMARY/SECONDARY)
3. J = ESTIMATED VALUE
4. AERIAL IMAGERY SOURCE: ESRI

0 180 360
SCALE IN FEET

HALEY ALDRICH

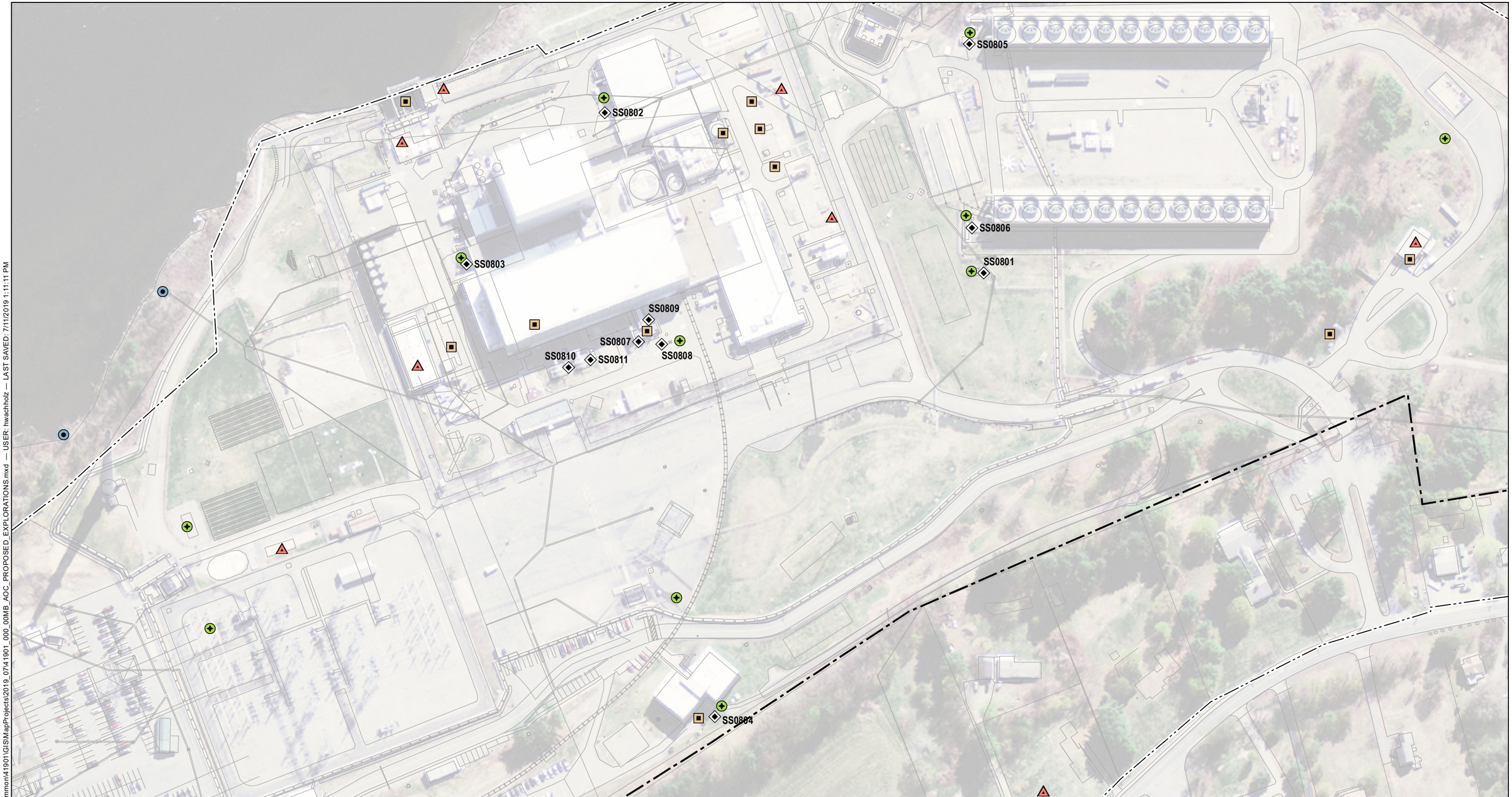
VERMONT YANKEE NUCLEAR POWER STATION
320 GOVERNOR HUNT ROAD
VERNON, VERMONT

AOC 7: FUEL STORAGE TANKS:
SOIL ANALYTICAL RESULTS EXCEEDING RESIDENTIAL AND NON-RESIDENTIAL SOIL STANDARDS

JULY 2019

FIGURE 5.7-2

GIS FILE PATH: \\haleyaldrich.com\share\bos_common\41901\GIS\MapProjects\2019_07\41901_000_00MB_AOC_SOIL_ANALYTICAL_RESULTS.mxd — USER: hwachholz — LAST SAVED: 7/11/2019 1:25:43 PM



LEGEND

- PROPOSED SOIL SAMPLING LOCATION
- SITE BOUNDARY
- EXCLUSION AREA
- AOC 7 - FUEL OIL STORAGE TANK
- AOC 8 - TRANSFORMER (OUTSIDE BUILDINGS)
- AOC 11 - HAZARDOUS MATERIALS/WASTE STORAGE AREA (NON-RAD)
- AOC 14 - STORMWATER OUTFALL

NOTES

1. PCS = POTENTIAL CONTAMINANT SOURCE
2. AERIAL IMAGERY SOURCE: ESRI

0 160 320
SCALE IN FEET

HALEY ALDRICH

VERMONT YANKEE NUCLEAR POWER STATION
320 GOVERNOR HUNT ROAD
VERNON, VERMONT

AOC 8: TRANSFORMERS: SAMPLING LOCATIONS

JULY 2019

FIGURE 5.8-1

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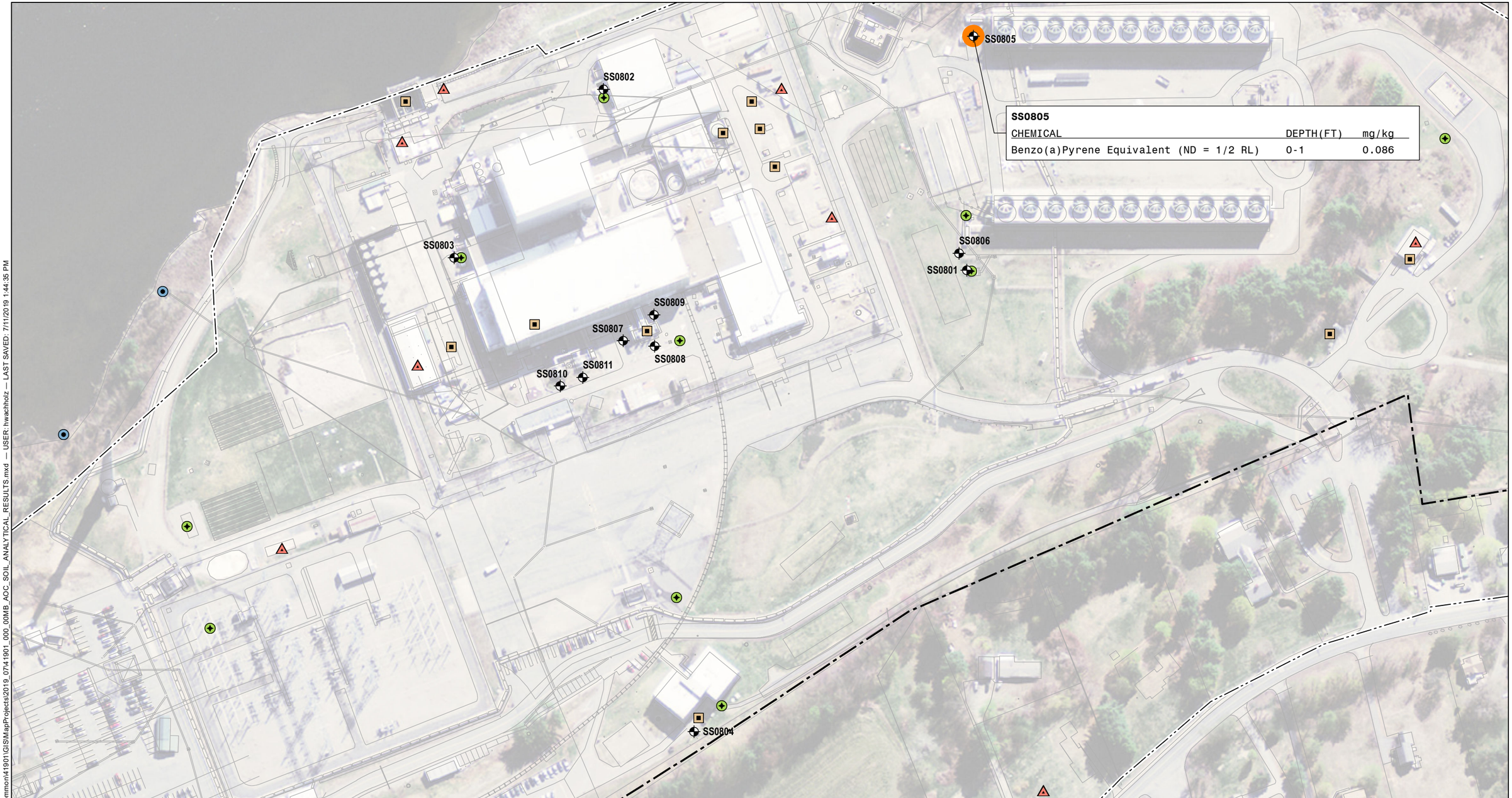

SS0805

CHEMICAL	DEPTH(FT)	mg/kg
Benzo(a)Pyrene Equivalent (ND = 1/2 RL)	0-1	0.086

LEGEND

- ACTUAL SAMPLED LOCATION
- SOIL ANALYTICAL RESULTS EXCEEDING RESIDENTIAL AND NON-RESIDENTIAL SOIL CRITERIA
- SITE BOUNDARY
- EXCLUSION AREA
- AOC 7 - FUEL OIL STORAGE TANK
- AOC 8 - TRANSFORMER (OUTSIDE BUILDINGS)
- AOC 11 - HAZARDOUS MATERIALS/WASTE STORAGE AREA (NON-RAD)
- AOC 14 - STORMWATER OUTFALL

NOTE

1. AERIAL IMAGERY SOURCE: ESRI

0 160 320
SCALE IN FEET

HALEY ALDRICH

VERMONT YANKEE NUCLEAR POWER STATION
320 GOVERNOR HUNT ROAD
VERNON, VERMONT

AOC 8: TRANSFORMERS:
SOIL ANALYTICAL RESULTS EXCEEDING RESIDENTIAL AND NON-RESIDENTIAL SOIL STANDARDS

JULY 2019

FIGURE 5.8-2

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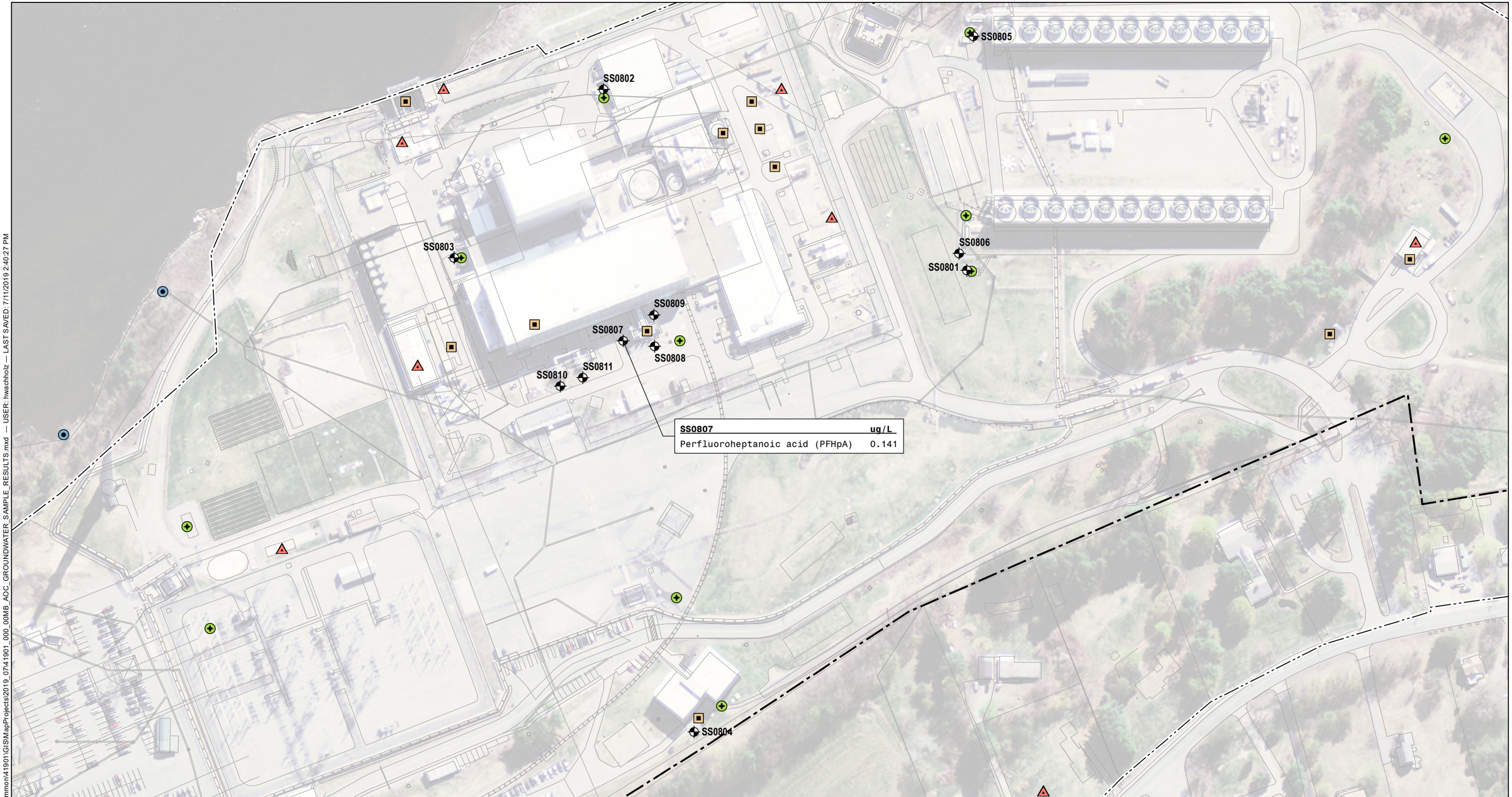

LEGEND

- ACTUAL SAMPLED LOCATION
- SITE BOUNDARY
- EXCLUSION AREA
- AOC 7 - FUEL OIL STORAGE TANK
- AOC 8 - TRANSFORMER (OUTSIDE BUILDINGS)
- AOC 11 - HAZARDOUS MATERIALS/WASTE STORAGE AREA (NON-RAD)
- AOC 14 - STORMWATER OUTFALL

NOTES

1. PCS = POTENTIAL CONTAMINANT SOURCE
2. VT GES = VERMONT GROUNDWATER ENFORCEMENT STANDARDS
3. AERIAL IMAGERY SOURCE: ESRI 2015

N

0 160 320
SCALE IN FEET

HALEY ALDRICH

VERMONT YANKEE NUCLEAR POWER STATION
320 GOVERNOR HUNT ROAD
VERNON, VERMONT

AOC 8: TRANSFORMERS GROUNDWATER ANALYTICAL RESULTS EXCEEDING GROUNDWATER ENFORCEMENT STANDARDS

JULY 2019

FIGURE 5.8-3

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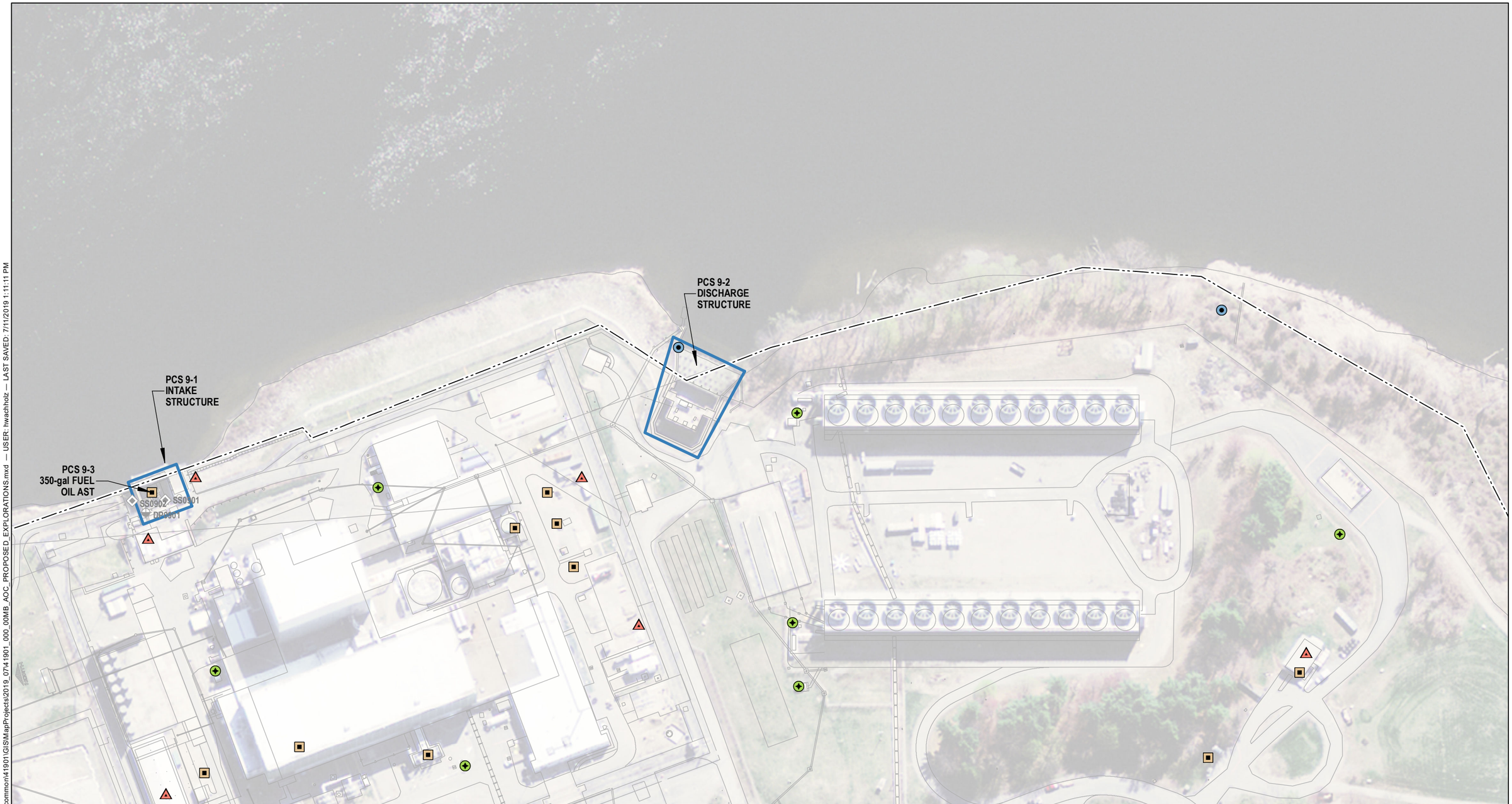

LEGEND

- SITE BOUNDARY
- EXCLUSION AREA
- AOC 7 - FUEL OIL STORAGE TANK
- AOC 8 - TRANSFORMER (OUTSIDE BUILDINGS)
- AOC 11 - HAZARDOUS MATERIALS/WASTE STORAGE AREA (NON-RAD)
- AOC 14 - STORMWATER OUTFALL
- LIMIT OF AREA OF CONCERN (AOC)

NOTES

1. PCS = POTENTIAL CONTAMINANT SOURCE
2. AERIAL IMAGERY SOURCE: ESRI

0 140 280
SCALE IN FEET

HALEY ALDRICH

VERMONT YANKEE NUCLEAR POWER STATION
320 GOVERNOR HUNT ROAD
VERNON, VERMONT

AOC 9: INTAKE AND DISCHARGE SYSTEMS: SAMPLING LOCATIONS

JULY 2019

FIGURE 5.9-1

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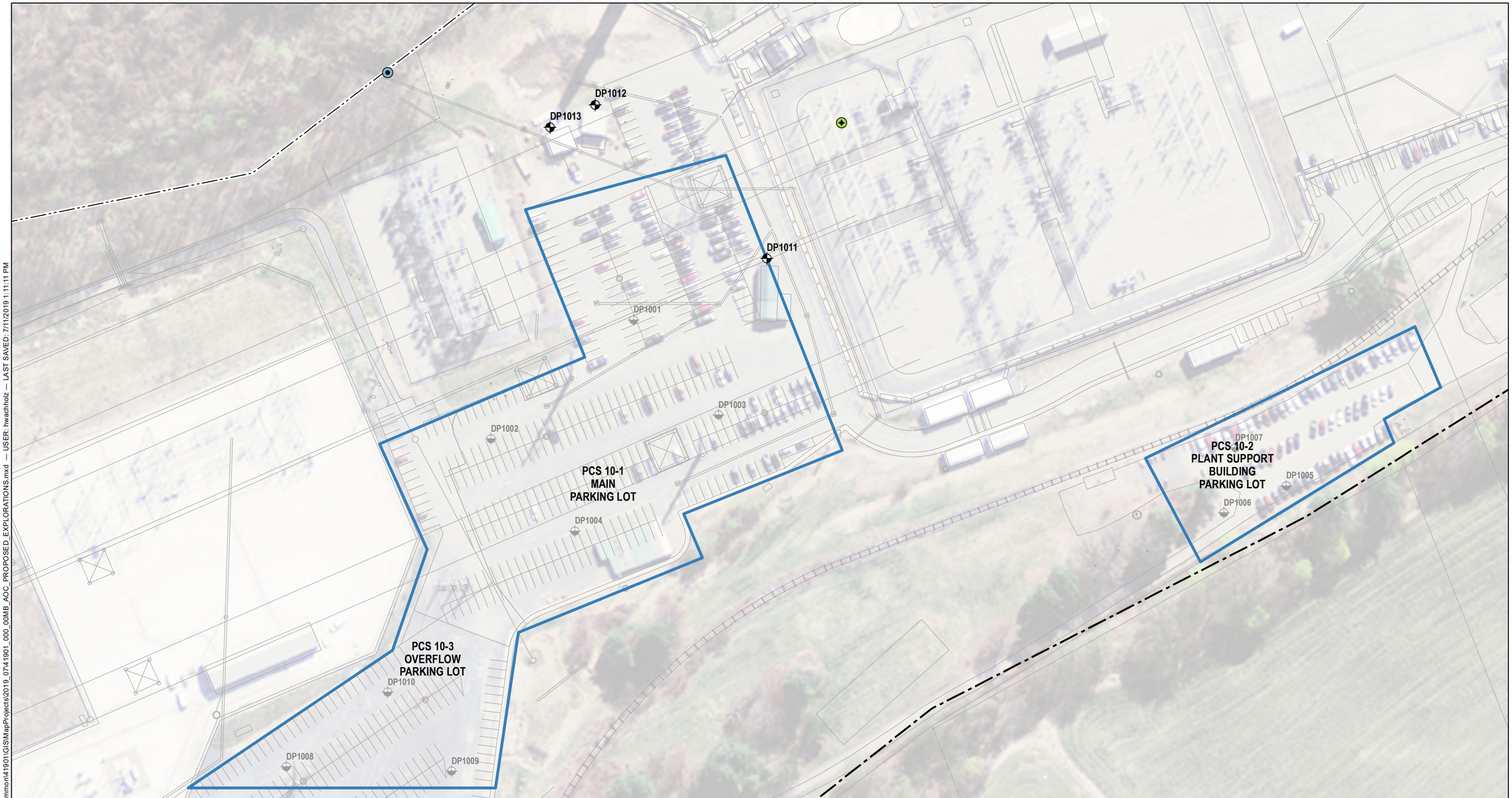

LEGEND

- ACTUAL SAMPLED LOCATION
- SITE BOUNDARY
- EXCLUSION AREA
- AOC 8 - TRANSFORMER (OUTSIDE BUILDINGS)
- AOC 14 - STORMWATER OUTFALL
- LIMIT OF AREA OF CONCERN (AOC)

NOTES

1. PCS = POTENTIAL CONTAMINANT SOURCE
2. AERIAL IMAGERY SOURCE: ESRI

0 100 200
SCALE IN FEET

HALEY ALDRICH

VERMONT YANKEE NUCLEAR POWER STATION
320 GOVERNOR HUNT ROAD
VERNON, VERMONT

AOC 10: PARKING LOTS:
SAMPLING LOCATIONS

JULY 2019

FIGURE 5.10-1

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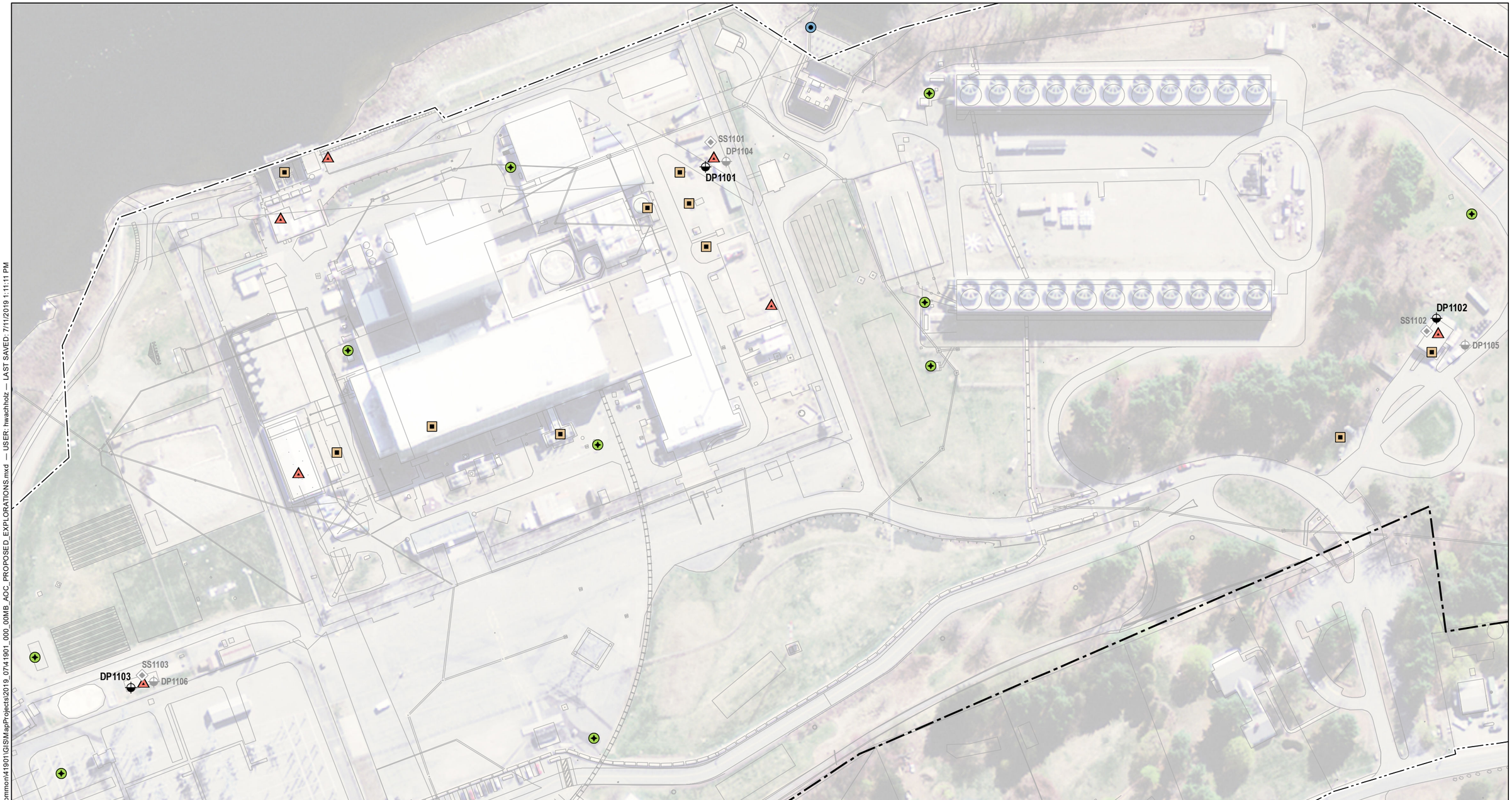

LEGEND

- PROPOSED DIRECT PUSH SAMPLING LOCATION
- SITE BOUNDARY
- EXCLUSION AREA
- AOC 7 - FUEL OIL STORAGE TANK
- AOC 8 - TRANSFORMER (OUTSIDE BUILDINGS)
- AOC 11 - HAZARDOUS MATERIALS/WASTE STORAGE AREA (NON-RAD)
- AOC 14 - STORMWATER OUTFALL

NOTES

1. PCS = POTENTIAL CONTAMINANT SOURCE
2. AERIAL IMAGERY SOURCE: ESRI

0 140 280
SCALE IN FEET

HALEY ALDRICH

VERMONT YANKEE NUCLEAR POWER STATION
320 GOVERNOR HUNT ROAD
VERNON, VERMONT

AOC 11: HAZARDOUS MATERIALS STORAGE: SAMPLING LOCATIONS

JULY 2019

FIGURE 5.11-1

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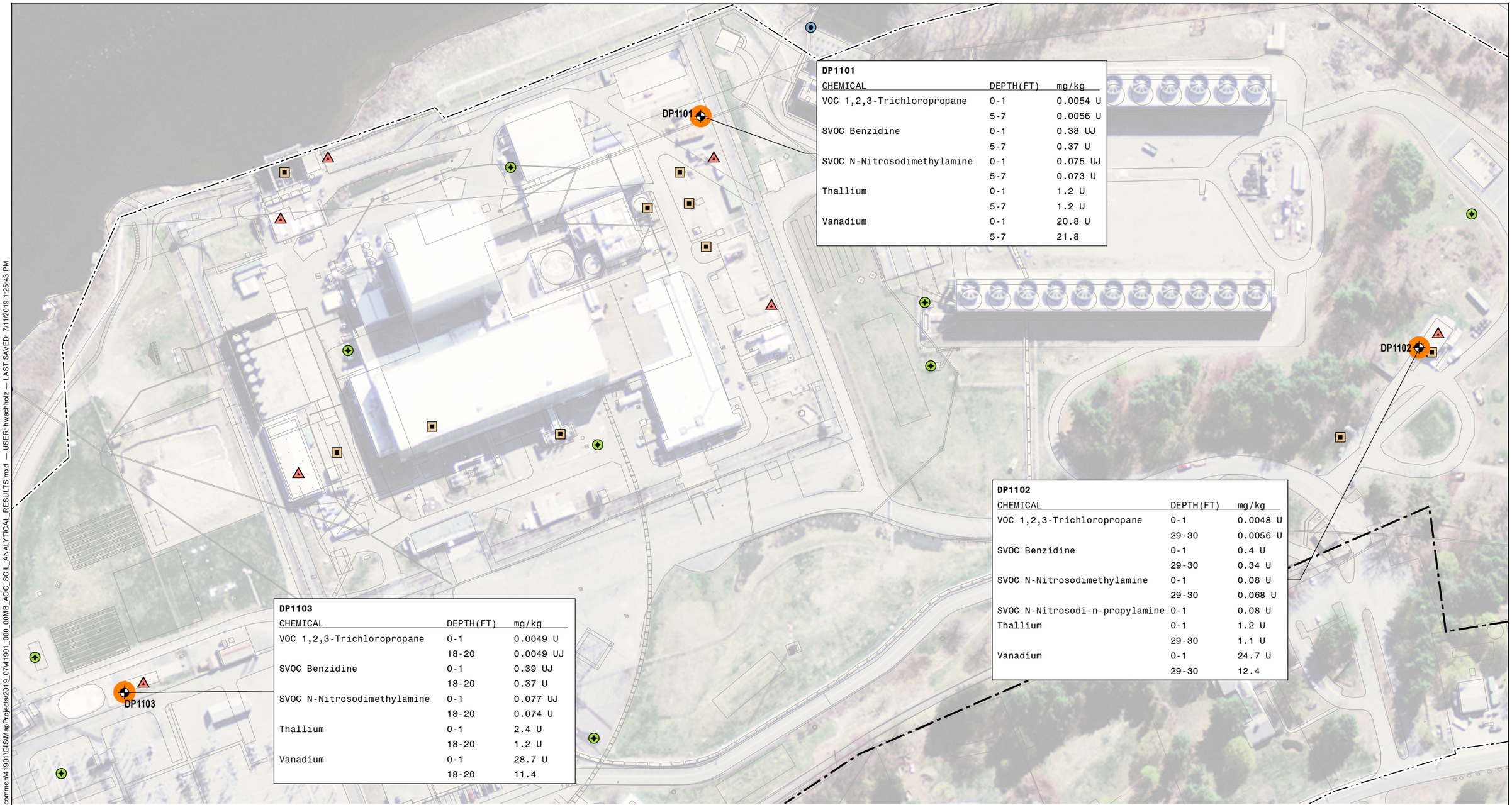

DP1101

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	0-1	0.0054 U
	5-7	0.0056 U
SVOC Benzidine	0-1	0.38 UJ
	5-7	0.37 U
SVOC N-Nitrosodimethylamine	0-1	0.075 UJ
	5-7	0.073 U
Thallium	0-1	1.2 U
	5-7	1.2 U
Vanadium	0-1	20.8 U
	5-7	21.8

DP1102

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	0-1	0.0048 U
	29-30	0.0056 U
SVOC Benzidine	0-1	0.4 U
	29-30	0.34 U
SVOC N-Nitrosodimethylamine	0-1	0.08 U
	29-30	0.068 U
SVOC N-Nitrosodi-n-propylamine	0-1	0.08 U
Thallium	0-1	1.2 U
	29-30	1.1 U
Vanadium	0-1	24.7 U
	29-30	12.4

DP1103

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	0-1	0.0049 U
	18-20	0.0049 UJ
SVOC Benzidine	0-1	0.39 UJ
	18-20	0.37 U
SVOC N-Nitrosodimethylamine	0-1	0.077 UJ
	18-20	0.074 U
Thallium	0-1	2.4 U
	18-20	1.2 U
Vanadium	0-1	28.7 U
	18-20	11.4

LEGEND

- ACTUAL SAMPLED LOCATION
- SOIL ANALYTICAL RESULTS EXCEEDING RESIDENTIAL AND NON-RESIDENTIAL SOIL CRITERIA
- SITE BOUNDARY
- EXCLUSION AREA
- AOC 7 - FUEL OIL STORAGE TANK
- AOC 8 - TRANSFORMER (OUTSIDE BUILDINGS)
- AOC 11 - HAZARDOUS MATERIALS/WASTE STORAGE AREA (NON-RAD)
- AOC 14 - STORMWATER OUTFALL

NOTES

1. U = NOT DETECTED, VALUE IS THE LABORATORY REPORTING LIMIT
2. J = ESTIMATED VALUE
3. AERIAL IMAGERY SOURCE: ESRI

0 140 280
SCALE IN FEET

HALEY ALDRICH

VERMONT YANKEE NUCLEAR POWER STATION
320 GOVERNOR HUNT ROAD
VERNON, VERMONT

AOC 11: HAZARDOUS MATERIALS STORAGE: SOIL ANALYTICAL RESULTS EXCEEDING RESIDENTIAL AND NON-RESIDENTIAL SOIL STANDARDS

JULY 2019

FIGURE 5.11-2

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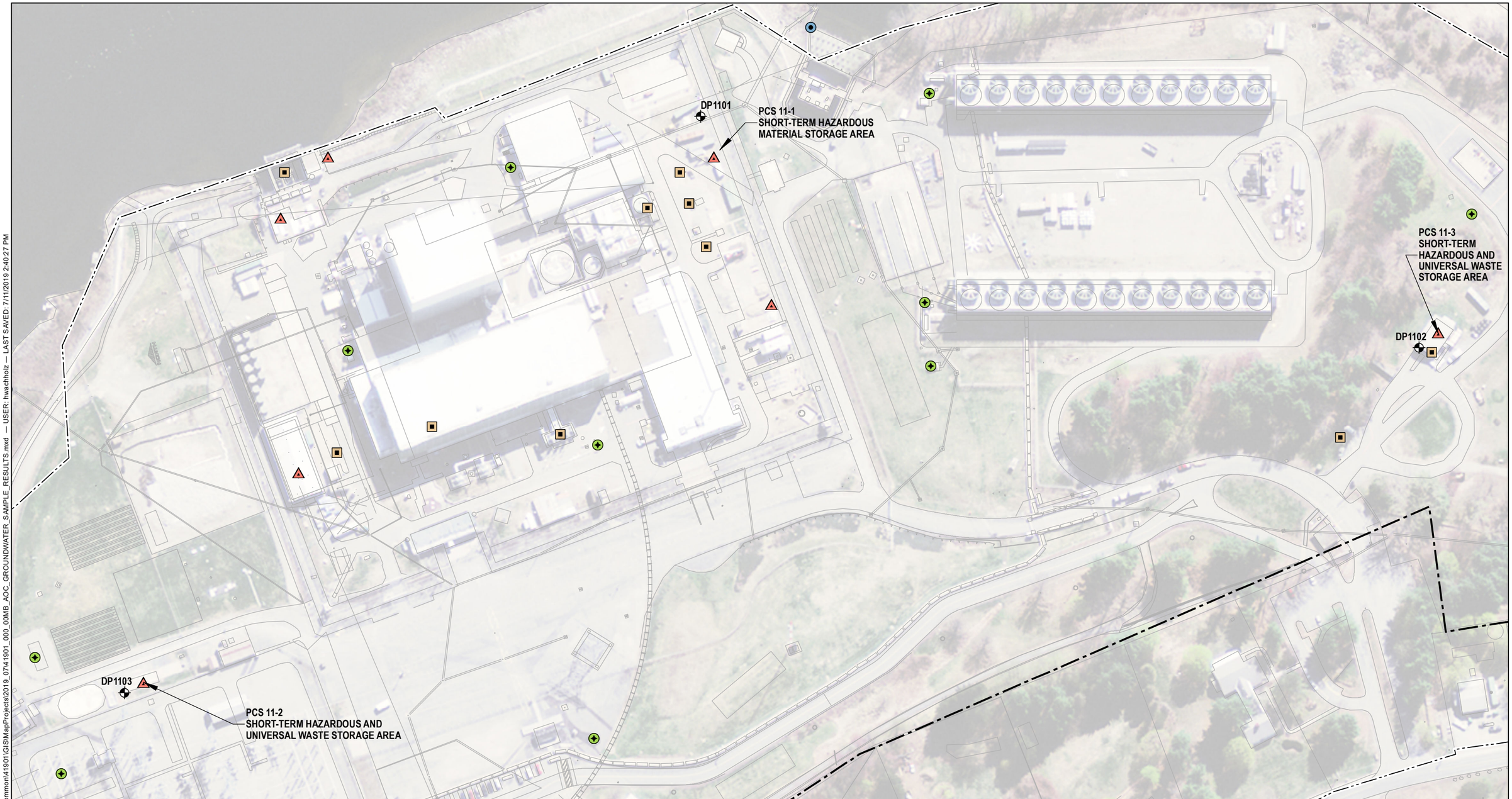

LEGEND

- ACTUAL SAMPLED LOCATION
- SITE BOUNDARY
- EXCLUSION AREA
- AOC 7 - FUEL OIL STORAGE TANK
- AOC 8 - TRANSFORMER (OUTSIDE BUILDINGS)
- AOC 11 - HAZARDOUS MATERIALS/WASTE STORAGE AREA (NON-RAD)
- AOC 14 - STORMWATER OUTFALL

NOTES

1. PCS = POTENTIAL CONTAMINANT SOURCE
2. VT GES = VERMONT GROUNDWATER ENFORCEMENT STANDARDS
3. AERIAL IMAGERY SOURCE: ESRI

N

0 140 280
SCALE IN FEET

HALEY ALDRICH

VERMONT YANKEE NUCLEAR POWER STATION
320 GOVERNOR HUNT ROAD
VERNON, VERMONT

AOC 11: HAZARDOUS MATERIALS STORAGE GROUNDWATER ANALYTICAL RESULTS EXCEEDING GROUNDWATER ENFORCEMENT STANDARDS

JULY 2019

FIGURE 5.11-3

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LEGEND

- ACTUAL SAMPLED LOCATION
- SITE BOUNDARY
- EXCLUSION AREA
- LIMIT OF AREA OF CONCERN (AOC)

NOTES

1. PCS = POTENTIAL CONTAMINANT SOURCE
2. AERIAL IMAGERY SOURCE: ESRI

0 40 80
SCALE IN FEET

HALEY ALDRICH

VERMONT YANKEE NUCLEAR POWER STATION
320 GOVERNOR HUNT ROAD
VERNON, VERMONT

AOC 12: FORMER EDSON'S GULF STATION & STORAGE: SAMPLING LOCATIONS

JULY 2019

FIGURE 5.12-1

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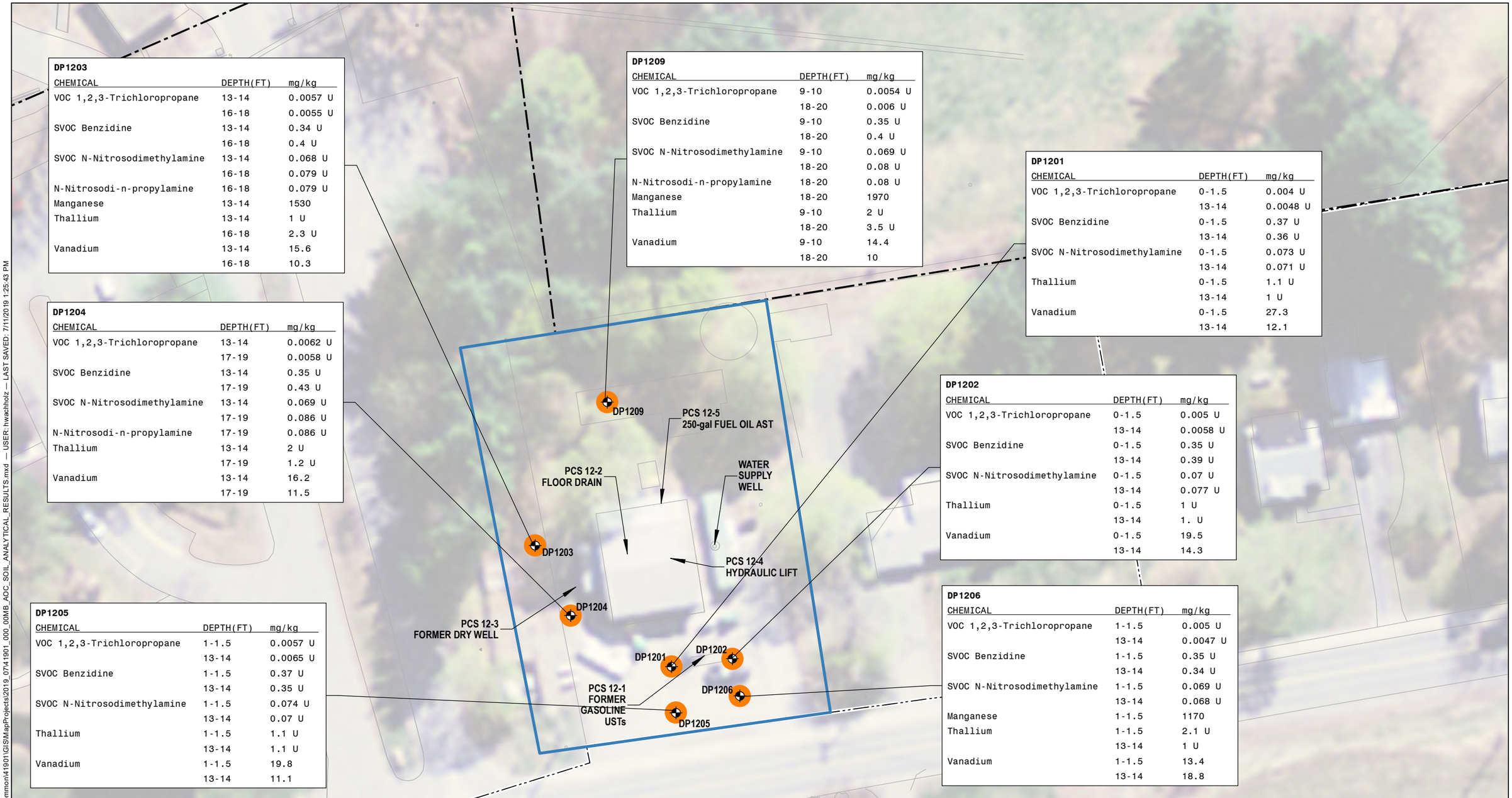

DP1203

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	13-14	0.0057 U
	16-18	0.0055 U
SVOC Benzidine	13-14	0.34 U
	16-18	0.4 U
SVOC N-Nitrosodimethylamine	13-14	0.068 U
	16-18	0.079 U
N-Nitrosodi-n-propylamine	16-18	0.079 U
Manganese	13-14	1530
Thallium	13-14	1 U
	16-18	2.3 U
Vanadium	13-14	15.6
	16-18	10.3

DP1209

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	9-10	0.0054 U
	18-20	0.006 U
SVOC Benzidine	9-10	0.35 U
	18-20	0.4 U
SVOC N-Nitrosodimethylamine	9-10	0.069 U
	18-20	0.08 U
N-Nitrosodi-n-propylamine	18-20	0.08 U
Manganese	18-20	1970
Thallium	9-10	2 U
	18-20	3.5 U
Vanadium	9-10	14.4
	18-20	10

DP1201

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	0-1.5	0.004 U
	13-14	0.0048 U
SVOC Benzidine	0-1.5	0.37 U
	13-14	0.36 U
SVOC N-Nitrosodimethylamine	0-1.5	0.073 U
	13-14	0.071 U
Thallium	0-1.5	1.1 U
	13-14	1 U
Vanadium	0-1.5	27.3
	13-14	12.1

DP1204

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	13-14	0.0062 U
	17-19	0.0058 U
SVOC Benzidine	13-14	0.35 U
	17-19	0.43 U
SVOC N-Nitrosodimethylamine	13-14	0.069 U
	17-19	0.086 U
N-Nitrosodi-n-propylamine	17-19	0.086 U
Thallium	13-14	2 U
	17-19	1.2 U
Vanadium	13-14	16.2
	17-19	11.5

DP1202

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	0-1.5	0.005 U
	13-14	0.0058 U
SVOC Benzidine	0-1.5	0.35 U
	13-14	0.39 U
SVOC N-Nitrosodimethylamine	0-1.5	0.07 U
	13-14	0.077 U
Thallium	0-1.5	1 U
	13-14	1. U
Vanadium	0-1.5	19.5
	13-14	14.3

DP1205

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	1-1.5	0.0057 U
	13-14	0.0065 U
SVOC Benzidine	1-1.5	0.37 U
	13-14	0.35 U
SVOC N-Nitrosodimethylamine	1-1.5	0.074 U
	13-14	0.07 U
Thallium	1-1.5	1.1 U
	13-14	1.1 U
Vanadium	1-1.5	19.8
	13-14	11.1

DP1206

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	1-1.5	0.005 U
	13-14	0.0047 U
SVOC Benzidine	1-1.5	0.35 U
	13-14	0.34 U
SVOC N-Nitrosodimethylamine	1-1.5	0.069 U
	13-14	0.068 U
Manganese	1-1.5	1170
Thallium	1-1.5	2.1 U
	13-14	1 U
Vanadium	1-1.5	13.4
	13-14	18.8

LEGEND

- ACTUAL SAMPLED LOCATION
- SOIL ANALYTICAL RESULTS EXCEEDING RESIDENTIAL AND NON-RESIDENTIAL SOIL CRITERIA
- SITE BOUNDARY
- EXCLUSION AREA
- LIMIT OF AREA OF CONCERN (AOC)

NOTES

1. U = NOT DETECTED, VALUE IS THE LABORATORY REPORTING LIMIT

2. AERIAL IMAGERY SOURCE: ESRI

0 40 80
SCALE IN FEET

HALEY ALDRICH

VERMONT YANKEE NUCLEAR POWER STATION
320 GOVERNOR HUNT ROAD
VERNON, VERMONT

AOC 12: FORMER EDSON'S GULF STATION & STORAGE: SOIL ANALYTICAL RESULTS EXCEEDING RESIDENTIAL AND NON-RESIDENTIAL SOIL STANDARDS

JULY 2019

FIGURE 5.12-2

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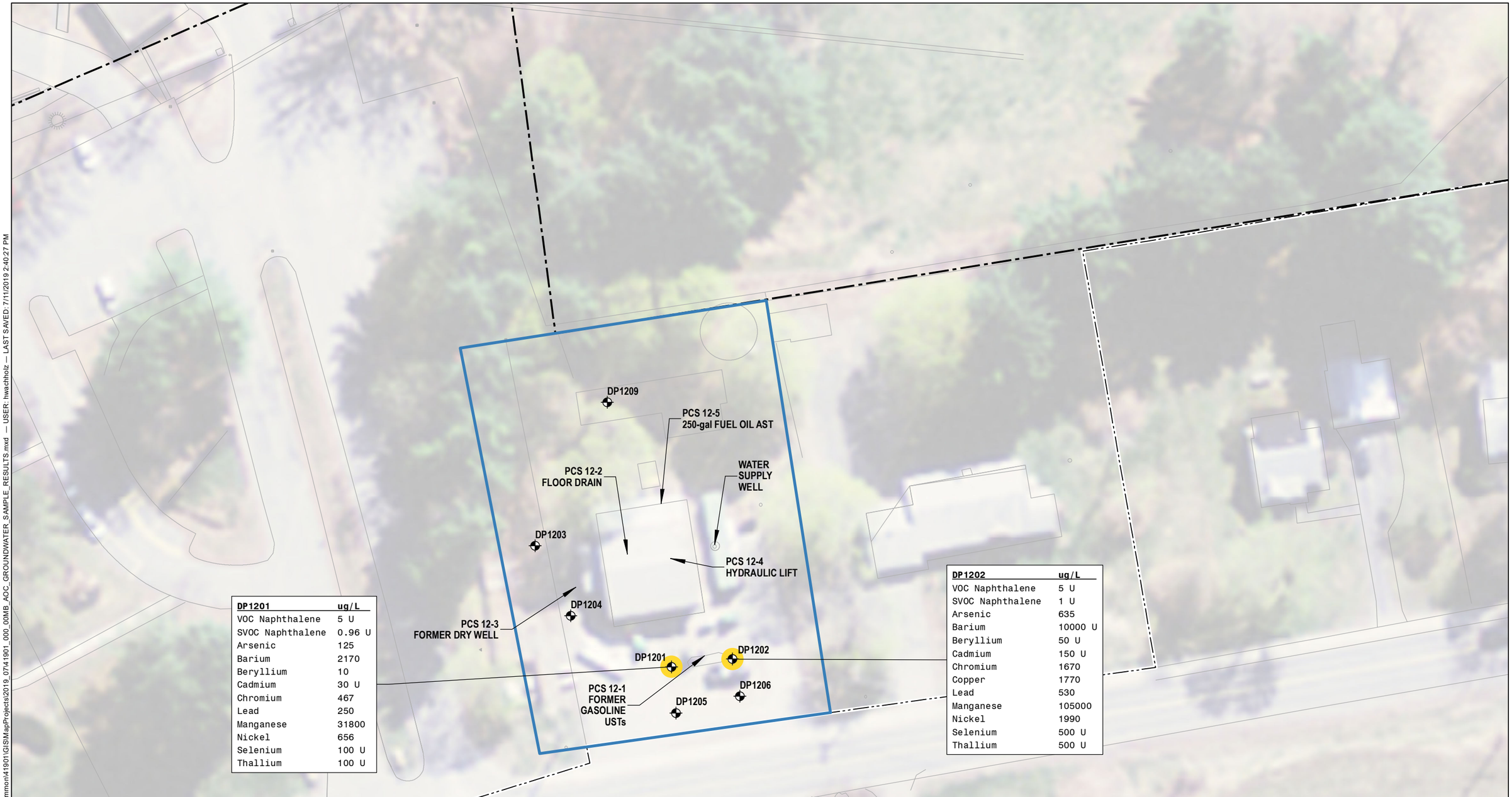

DP1201	ug/L
VOC Naphthalene	5 U
SVOC Naphthalene	0.96 U
Arsenic	125
Barium	2170
Beryllium	10
Cadmium	30 U
Chromium	467
Lead	250
Manganese	31800
Nickel	656
Selenium	100 U
Thallium	100 U

DP1202	ug/L
VOC Naphthalene	5 U
SVOC Naphthalene	1 U
Arsenic	635
Barium	10000 U
Beryllium	50 U
Cadmium	150 U
Chromium	1670
Copper	1770
Lead	530
Manganese	105000
Nickel	1990
Selenium	500 U
Thallium	500 U

LEGEND

- ACTUAL SAMPLED LOCATION
- GROUNDWATER GRAB DATA FROM OPEN BORINGS EXCEEDING THE VT GES
- SITE BOUNDARY
- EXCLUSION AREA
- LIMIT OF AREA OF CONCERN (AOC)

NOTES

1. PCS = POTENTIAL CONTAMINANT SOURCE
2. VT GES = VERMONT GROUNDWATER ENFORCEMENT STANDARDS
3. U = NOT DETECTED, VALUE IS THE LABORATORY REPORTING LIMIT
4. AERIAL IMAGERY SOURCE: ESRI

0 40 80
SCALE IN FEET

HALEY ALDRICH

VERMONT YANKEE NUCLEAR POWER STATION
320 GOVERNOR HUNT ROAD
VERNON, VERMONT

AOC 12: FORMER EDSON'S GULF STATION & STORAGE GROUNDWATER ANALYTICAL RESULTS EXCEEDING GROUNDWATER ENFORCEMENT STANDARDS

JULY 2019

FIGURE 5.12-3

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LEGEND

- ACTUAL SAMPLED LOCATION
- PROPOSED DIRECT PUSH SAMPLING LOCATION
- SITE BOUNDARY
- EXCLUSION AREA
- AOC 7 - FUEL OIL STORAGE TANK
- AOC 8 - TRANSFORMER (OUTSIDE BUILDINGS)
- AOC 11 - HAZARDOUS MATERIALS/WASTE STORAGE AREA (NON-RAD)
- AOC 14 - STORMWATER OUTFALL
- LIMIT OF AREA OF CONCERN (AOC)

NOTES

1. PCS = POTENTIAL CONTAMINANT SOURCE
2. AERIAL IMAGERY SOURCE: ESRI

0 300 600
SCALE IN FEET

HALEY ALDRICH

VERMONT YANKEE NUCLEAR POWER STATION
320 GOVERNOR HUNT ROAD
VERNON, VERMONT

AOC 13: SEPTIC SYSTEMS AND APPLICATION AREAS: SAMPLING LOCATIONS

JULY 2019

FIGURE 5.13-1

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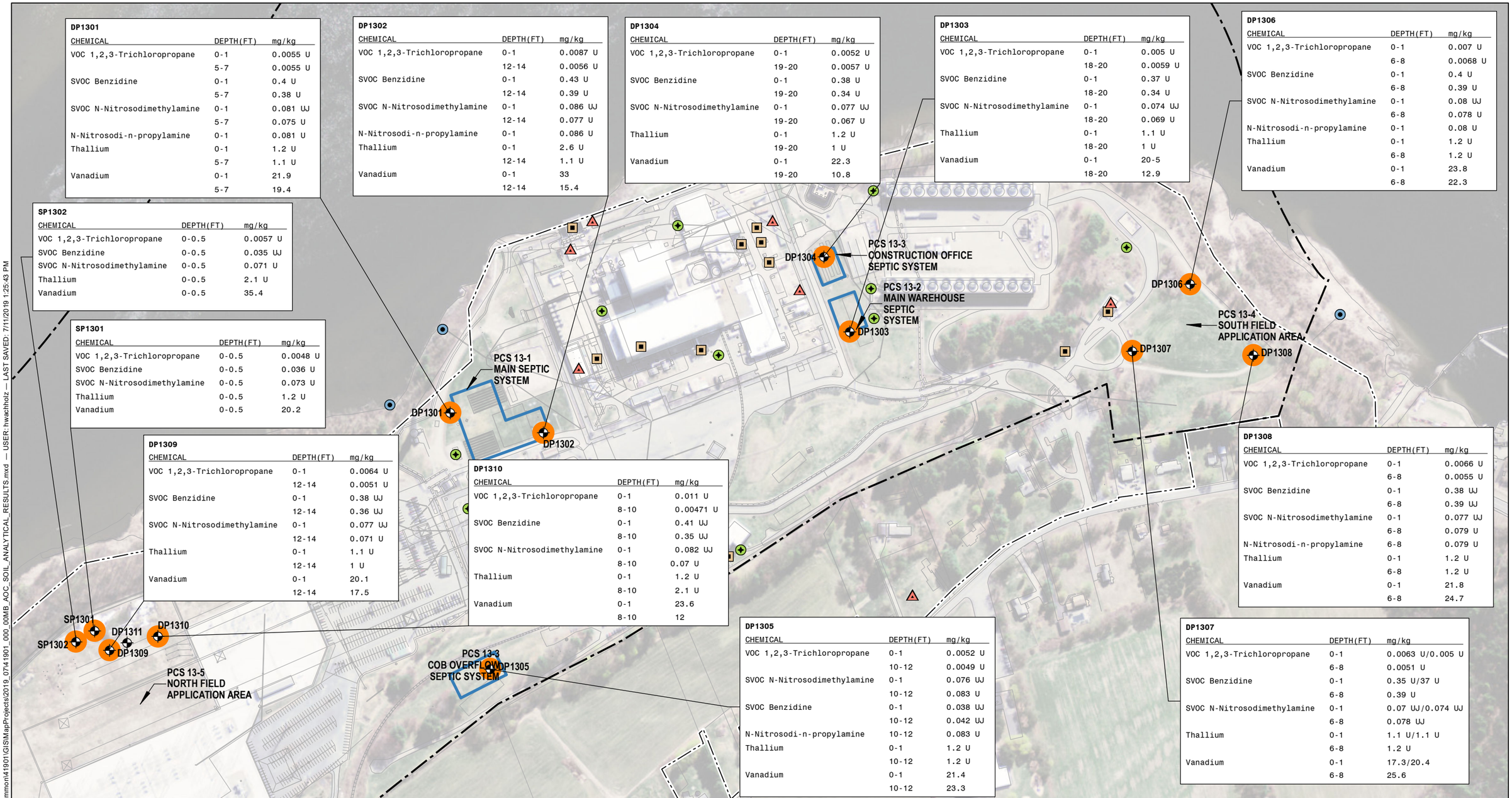


DP1301

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	0-1	0.0055 U
	5-7	0.0055 U
SVOC Benzidine	0-1	0.4 U
	5-7	0.38 U
SVOC N-Nitrosodimethylamine	0-1	0.081 UJ
	5-7	0.075 U
N-Nitrosodi-n-propylamine	0-1	0.081 U
Thallium	0-1	1.2 U
	5-7	1.1 U
Vanadium	0-1	21.9
	5-7	19.4

DP1302

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	0-1	0.0087 U
	12-14	0.0056 U
SVOC Benzidine	0-1	0.43 U
	12-14	0.39 U
SVOC N-Nitrosodimethylamine	0-1	0.086 UJ
	12-14	0.077 U
N-Nitrosodi-n-propylamine	0-1	0.086 U
Thallium	0-1	2.6 U
	12-14	1.1 U
Vanadium	0-1	33
	12-14	15.4

DP1304

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	0-1	0.0052 U
	19-20	0.0057 U
SVOC Benzidine	0-1	0.38 U
	19-20	0.34 U
SVOC N-Nitrosodimethylamine	0-1	0.077 UJ
	19-20	0.067 U
Thallium	0-1	1.2 U
	19-20	1 U
Vanadium	0-1	22.3
	19-20	10.8

DP1303

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	0-1	0.005 U
	18-20	0.0059 U
SVOC Benzidine	0-1	0.37 U
	18-20	0.34 U
SVOC N-Nitrosodimethylamine	0-1	0.074 UJ
	18-20	0.069 U
Thallium	0-1	1.1 U
	18-20	1 U
Vanadium	0-1	20-5
	18-20	12.9

DP1306

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	0-1	0.007 U
	6-8	0.0068 U
SVOC Benzidine	0-1	0.4 U
	6-8	0.39 U
SVOC N-Nitrosodimethylamine	0-1	0.08 UJ
	6-8	0.078 U
N-Nitrosodi-n-propylamine	0-1	0.08 U
Thallium	0-1	1.2 U
	6-8	1.2 U
Vanadium	0-1	23.8
	6-8	22.3

SP1302

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	0-0.5	0.0057 U
SVOC Benzidine	0-0.5	0.035 UJ
SVOC N-Nitrosodimethylamine	0-0.5	0.071 U
Thallium	0-0.5	2.1 U
Vanadium	0-0.5	35.4

SP1301

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	0-0.5	0.0048 U
SVOC Benzidine	0-0.5	0.036 U
SVOC N-Nitrosodimethylamine	0-0.5	0.073 U
Thallium	0-0.5	1.2 U
Vanadium	0-0.5	20.2

DP1309

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	0-1	0.0064 U
	12-14	0.0051 U
SVOC Benzidine	0-1	0.38 UJ
	12-14	0.36 UJ
SVOC N-Nitrosodimethylamine	0-1	0.077 UJ
	12-14	0.071 U
Thallium	0-1	1.1 U
	12-14	1 U
Vanadium	0-1	20.1
	12-14	17.5

DP1310

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	0-1	0.011 U
	8-10	0.00471 U
SVOC Benzidine	0-1	0.41 UJ
	8-10	0.35 UJ
SVOC N-Nitrosodimethylamine	0-1	0.082 UJ
	8-10	0.07 U
Thallium	0-1	1.2 U
	8-10	2.1 U
Vanadium	0-1	23.6
	8-10	12

DP1308

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	0-1	0.0066 U
	6-8	0.0055 U
SVOC Benzidine	0-1	0.38 UJ
	6-8	0.39 UJ
SVOC N-Nitrosodimethylamine	0-1	0.077 UJ
	6-8	0.079 U
N-Nitrosodi-n-propylamine	6-8	0.079 U
Thallium	0-1	1.2 U
	6-8	1.2 U
Vanadium	0-1	21.8
	6-8	24.7

DP1305

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	0-1	0.0052 U
	10-12	0.0049 U
SVOC N-Nitrosodimethylamine	0-1	0.076 UJ
	10-12	0.083 U
SVOC Benzidine	0-1	0.038 UJ
	10-12	0.042 UJ
N-Nitrosodi-n-propylamine	10-12	0.083 U
Thallium	0-1	1.2 U
	10-12	1.2 U
Vanadium	0-1	21.4
	10-12	23.3

DP1307

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	0-1	0.0063 U/0.005 U
	6-8	0.0051 U
SVOC Benzidine	0-1	0.35 U/37 U
	6-8	0.39 U
SVOC N-Nitrosodimethylamine	0-1	0.07 UJ/0.074 UJ
	6-8	0.078 UJ
Thallium	0-1	1.1 U/1.1 U
	6-8	1.2 U
Vanadium	0-1	17.3/20.4
	6-8	25.6

LEGEND

- ACTUAL SAMPLED LOCATION
- SOIL ANALYTICAL RESULTS EXCEEDING RESIDENTIAL AND NON-RESIDENTIAL SOIL CRITERIA
- SITE BOUNDARY
- EXCLUSION AREA
- AOC 7 - FUEL OIL STORAGE TANK
- AOC 8 - TRANSFORMER (OUTSIDE BUILDINGS)
- AOC 11 - HAZARDOUS MATERIALS/WASTE STORAGE AREA (NON-RAD)
- AOC 14 - STORMWATER OUTFALL
- LIMIT OF AREA OF CONCERN (AOC)

NOTES

1. U = NOT DETECTED, VALUE IS THE LABORATORY REPORTING LIMIT
2. / = DUPLICATE RESULT (PRIMARY/SECONDARY)
3. J = ESTIMATED VALUE
4. AERIAL IMAGERY SOURCE: ESRI

0 300 600
SCALE IN FEET

HALEY ALDRICH

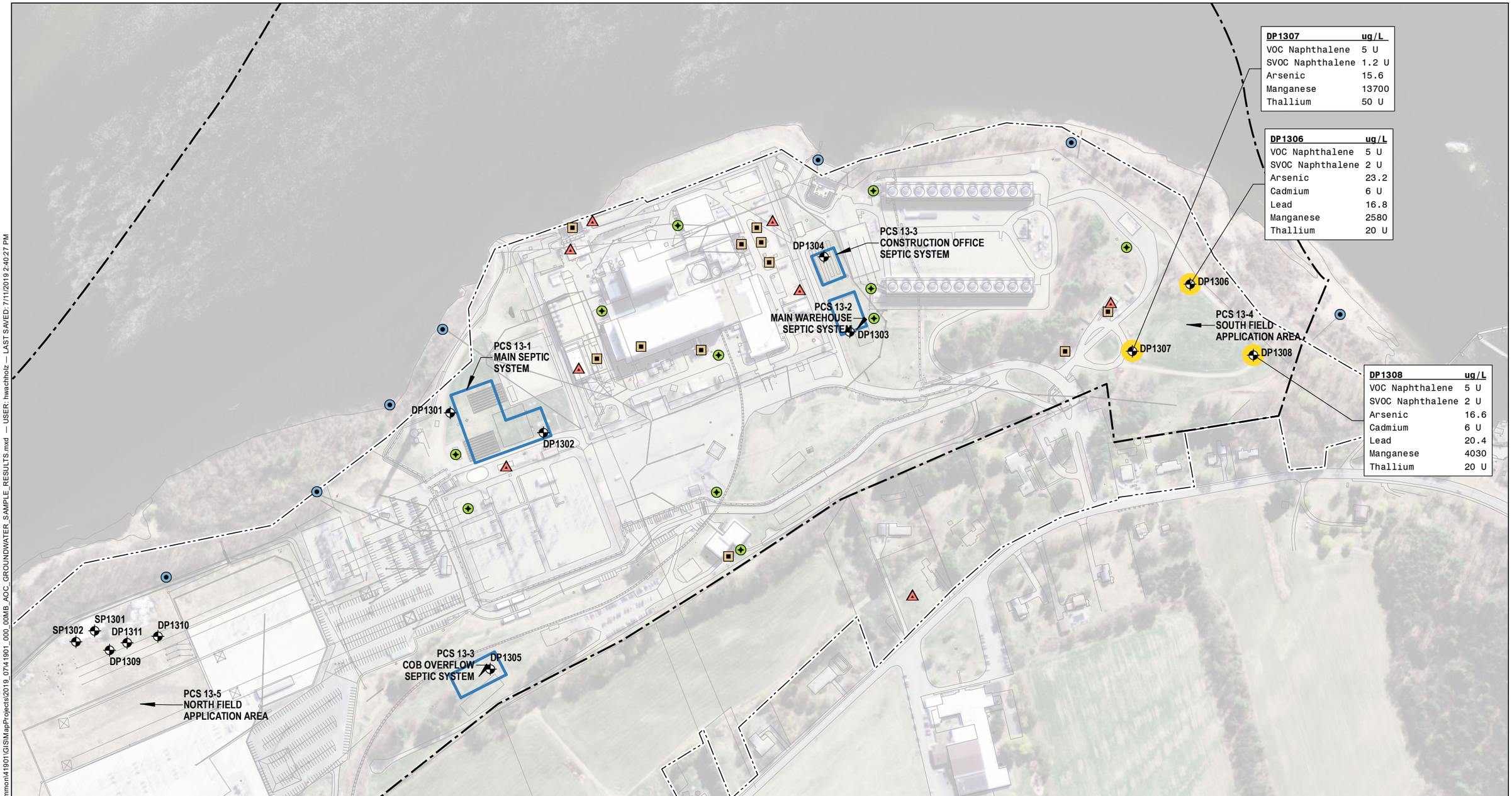
VERMONT YANKEE NUCLEAR POWER STATION
320 GOVERNOR HUNT ROAD
VERNON, VERMONT

AOC 13: SEPTIC SYSTEMS AND APPLICATION AREAS: SOIL ANALYTICAL RESULTS EXCEEDING RESIDENTIAL AND NON-RESIDENTIAL SOIL STANDARDS

JULY 2019

FIGURE 5.13-2

GIS FILE PATH: \\haleyaldrich.com\share\bos_common\41901\GIS\MapProjects\2019_07141901_000_00MB_AOC_SOIL_ANALYTICAL_RESULTS.mxd — USER: hwachholz — LAST SAVED: 7/11/2019 1:25:43 PM



LEGEND

- ACTUAL SAMPLED LOCATION
- GROUNDWATER GRAB DATA FROM OPEN BORINGS EXCEEDING THE VT GES
- SITE BOUNDARY
- EXCLUSION AREA
- AOC 7 - FUEL OIL STORAGE TANK
- AOC 8 - TRANSFORMER (OUTSIDE BUILDINGS)
- AOC 11 - HAZARDOUS MATERIALS/WASTE STORAGE AREA (NON-RAD)
- AOC 14 - STORMWATER OUTFALL
- LIMIT OF AREA OF CONCERN (AOC)

NOTES

1. PCS = POTENTIAL CONTAMINANT SOURCE
2. VT GES = VERMONT GROUNDWATER ENFORCEMENT STANDARDS
3. U = NOT DETECTED, VALUE IS THE LABORATORY REPORTING LIMIT
4. AERIAL IMAGERY SOURCE: ESRI

N

0 300 600
SCALE IN FEET

HALEY ALDRICH

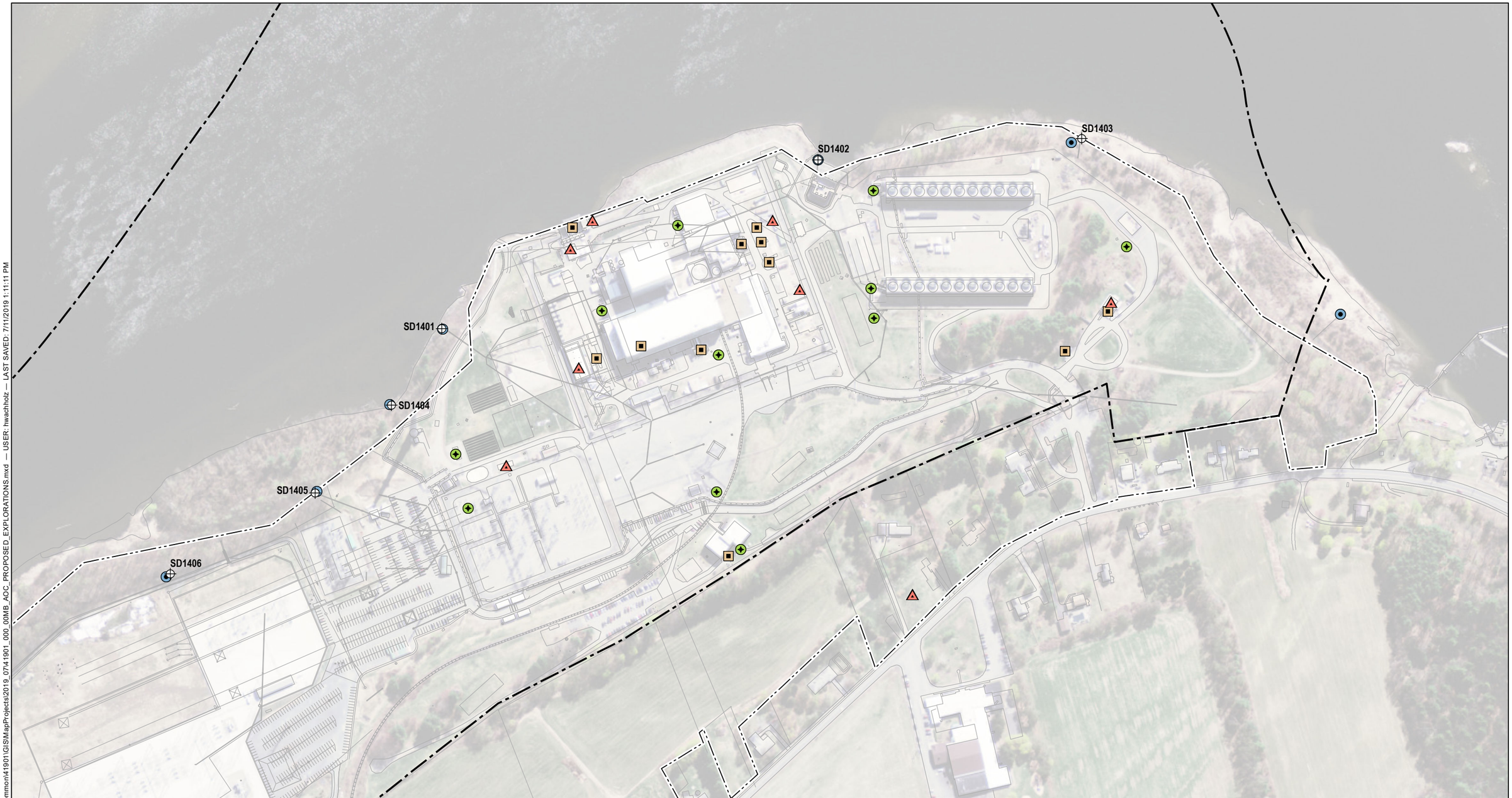
VERMONT YANKEE NUCLEAR POWER STATION
320 GOVERNOR HUNT ROAD
VERNON, VERMONT

AOC 13: SEPTIC SYSTEMS AND APPLICATION AREAS GROUNDWATER ANALYTICAL RESULTS EXCEEDING GROUNDWATER ENFORCEMENT STANDARDS

JULY 2019

FIGURE 5.13-3

GIS FILE PATH: \\haleyaldrich.com\share\bos_common\419011\GIS\MapProjects\2019_07\419011_000_00MB_AOC_GROUNDWATER_SAMPLE_RESULTS.mxd — USER: hwachholz — LAST SAVED: 7/11/2019 2:40:27 PM



LEGEND

- PROPOSED SEDIMENT SAMPLING LOCATION
- SITE BOUNDARY
- EXCLUSION AREA
- AOC 7 - FUEL OIL STORAGE TANK
- AOC 8 - TRANSFORMER (OUTSIDE BUILDINGS)
- AOC 11 - HAZARDOUS MATERIALS/WASTE STORAGE AREA (NON-RAD)
- AOC 14 - STORMWATER OUTFALL

NOTES

1. PCS = POTENTIAL CONTAMINANT SOURCE
2. AERIAL IMAGERY SOURCE: ESRI

N

0 300 600
SCALE IN FEET

HALEY ALDRICH

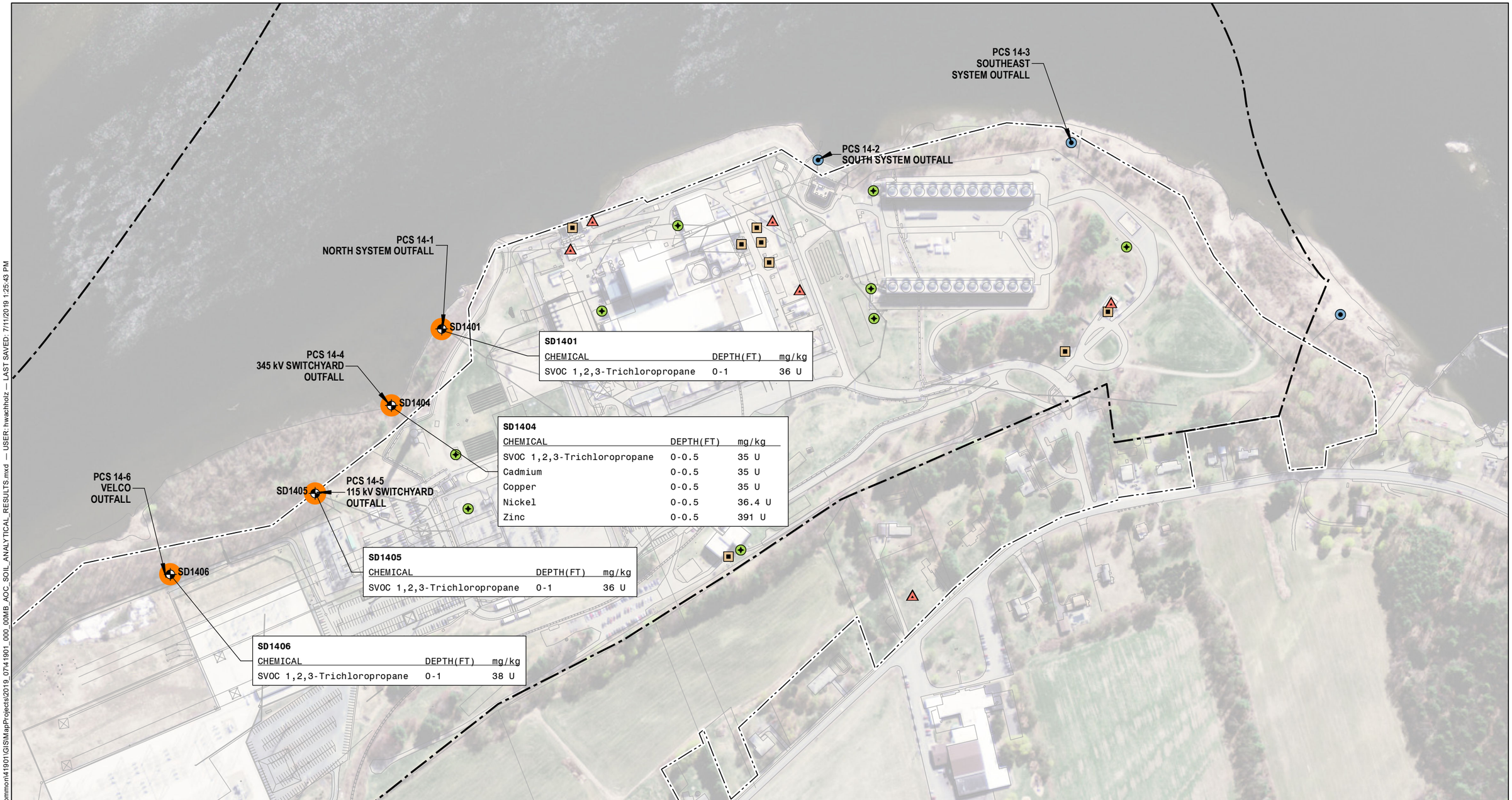
VERMONT YANKEE NUCLEAR POWER STATION
320 GOVERNOR HUNT ROAD
VERNON, VERMONT

AOC 14: STORMWATER OUTFALLS: SAMPLING LOCATIONS

JULY 2019

FIGURE 5.14-1

GIS FILE PATH: \\haleyaldrich.com\share\bos_common\41901\GIS\MapProjects\2019_07\41901_000_00MB_AOC_PROPOSED_EXPLORATIONS.mxd — USER: hwachholz — LAST SAVED: 7/11/2019 1:11:11 PM



SD1401

CHEMICAL	DEPTH(FT)	mg/kg
SVOC 1,2,3-Trichloropropane	0-1	36 U

SD1404

CHEMICAL	DEPTH(FT)	mg/kg
SVOC 1,2,3-Trichloropropane	0-0.5	35 U
Cadmium	0-0.5	35 U
Copper	0-0.5	35 U
Nickel	0-0.5	36.4 U
Zinc	0-0.5	391 U

SD1405

CHEMICAL	DEPTH(FT)	mg/kg
SVOC 1,2,3-Trichloropropane	0-1	36 U

SD1406

CHEMICAL	DEPTH(FT)	mg/kg
SVOC 1,2,3-Trichloropropane	0-1	38 U

LEGEND

- ACTUAL SAMPLED LOCATION
- SOIL ANALYTICAL RESULTS EXCEEDING RESIDENTIAL AND NON-RESIDENTIAL SOIL CRITERIA
- SITE BOUNDARY
- EXCLUSION AREA
- AOC 7 - FUEL OIL STORAGE TANK
- AOC 8 - TRANSFORMER (OUTSIDE BUILDINGS)
- AOC 11 - HAZARDOUS MATERIALS/WASTE STORAGE AREA (NON-RAD)
- AOC 14 - STORMWATER OUTFALL

NOTES

1. U = NOT DETECTED, VALUE IS THE LABORATORY REPORTING LIMIT
2. AERIAL IMAGERY SOURCE: ESRI

N

0 300 600
SCALE IN FEET

HALEY ALDRICH

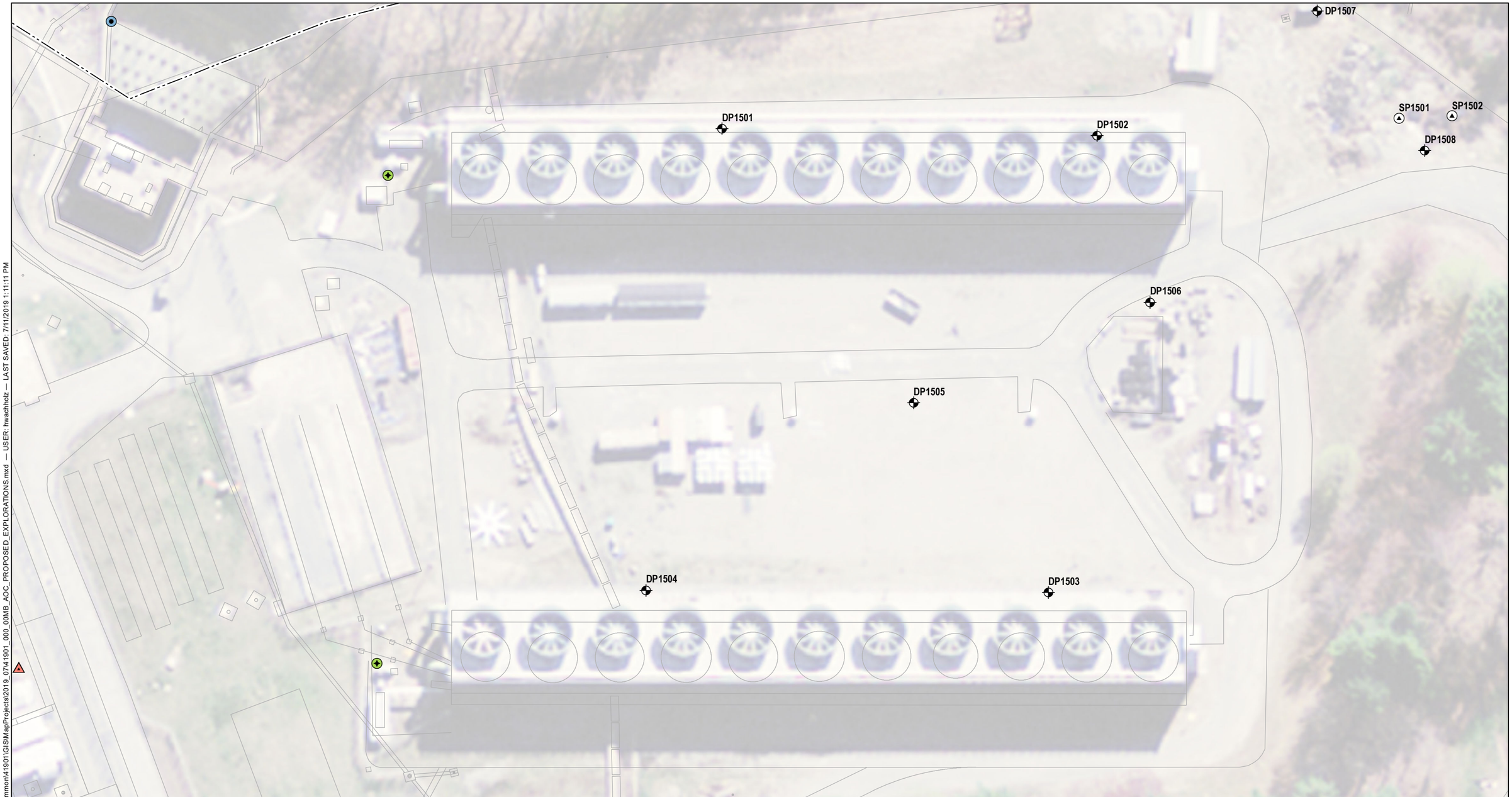
VERMONT YANKEE NUCLEAR POWER STATION
320 GOVERNOR HUNT ROAD
VERNON, VERMONT

AOC 14: STORMWATER OUTFALLS: SEDIMENT ANALYTICAL RESULTS EXCEEDING RESIDENTIAL AND NON-RESIDENTIAL SOIL STANDARDS

JULY 2019

FIGURE 5.14-2

GIS FILE PATH: \\haleyaldrich.com\share\bos_common\41901\GISMapProjects\2019_07\41901_000_00MB_AOC_SOIL_ANALYTICAL_RESULTS.mxd — USER: hwachholz — LAST SAVED: 7/11/2019 1:25:43 PM



LEGEND

- ACTUAL SAMPLED LOCATION
- PROPOSED STOCKPILE SAMPLING LOCATION
- SITE BOUNDARY
- EXCLUSION AREA

NOTES

1. PCS = POTENTIAL CONTAMINANT SOURCE
2. AERIAL IMAGERY SOURCE: ESRI

N

0 60 120
SCALE IN FEET

HALEY ALDRICH

VERMONT YANKEE NUCLEAR POWER STATION
320 GOVERNOR HUNT ROAD
VERNON, VERMONT

AOC 15: COOLING TOWER AREA:
SAMPLING LOCATIONS

JULY 2019

FIGURE 5.15-1

GIS FILE PATH: \\haleyaldrich.com\share\bos_common\41901\GIS\MapProjects\2019_07\41901_000_00MB_AOC_PROPOSED_EXPLORATIONS.mxd — USER: hwachholz — LAST SAVED: 7/11/2019 1:11:11 PM

DP1501

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	0-1	0.0065 U
	25-26.5	0.0041 U
Thallium	0-1	1.2 U
	25-26.5	1.1 U
Vanadium	0-1	19.2
	25-26.5	14.8

DP1507

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	0-1	0.0052 U/0.006 U
	28-29	0.0042 U
Thallium	0-1	1.3 U/1.3 U
	28-29	1.1 U
Vanadium	0-1	24.4/21.6
	28-29	15.1

DP1502

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	0-1	0.0081 U
	26-27	0.0042 U
Thallium	0-1	1.1 U
	26-27	1.1 U
Vanadium	0-1	14.1
	26-27	15

DP1506

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	0-1	0.0047 U
	23-24	0.0054 U
Thallium	0-1	1.1 U
	23-24	1.1 U
Vanadium	0-1	22.7
	23-24	15.3

SP1501

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	0-0.5	0.008 U/0.0095 U
Thallium	0-0.5	1.2 U/1.1 U
Vanadium	0-0.5	17.5/17.5

DP1505

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	0-1	0.0052 U
	14-15	0.0052 U
Thallium	0-1	1.1 U
	14-15	1.1 U
Vanadium	0-1	15.7
	14-15	9.8

DP1508

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	0-1	0.006 U
	26-27	0.0041 U
Thallium	0-1	1.2 U
	26-27	1.1 U
Vanadium	0-1	20.1
	26-27	13.9

DP1504

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	0-1	0.0058 U
	15-16	0.0037 U
Thallium	0-1	1.1 U
	15-16	1.1 U
Vanadium	0-1	18.1
	15-16	14.6

DP1503

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	0-1	0.0061 U
	10-11.5	0.0056 U
Thallium	0-1	1.2 U
	10-11.5	1.1 U
Vanadium	0-1	18.8
	10-11.5	16.8

SP1502

CHEMICAL	DEPTH(FT)	mg/kg
VOC 1,2,3-Trichloropropane	0-0.5	0.0072 U
Thallium	0-0.5	1.1
Vanadium	0-0.5	26.4

LEGEND

- ACTUAL SAMPLED LOCATION
- SOIL ANALYTICAL RESULTS EXCEEDING RESIDENTIAL AND NON-RESIDENTIAL SOIL CRITERIA
- SITE BOUNDARY
- EXCLUSION AREA

NOTES

1. U = NOT DETECTED, VALUE IS THE LABORATORY REPORTING LIMIT
2. / = DUPLICATE RESULT (PRIMARY/SECONDARY)
3. AERIAL IMAGERY SOURCE: ESRI

0 60 120
SCALE IN FEET

HALEY ALDRICH

VERMONT YANKEE NUCLEAR POWER STATION
320 GOVERNOR HUNT ROAD
VERNON, VERMONT

AOC 15: COOLING TOWER AREA:
SOIL ANALYTICAL RESULTS EXCEEDING RESIDENTIAL AND NON-RESIDENTIAL SOIL STANDARDS

JULY 2019

FIGURE 5.15-2

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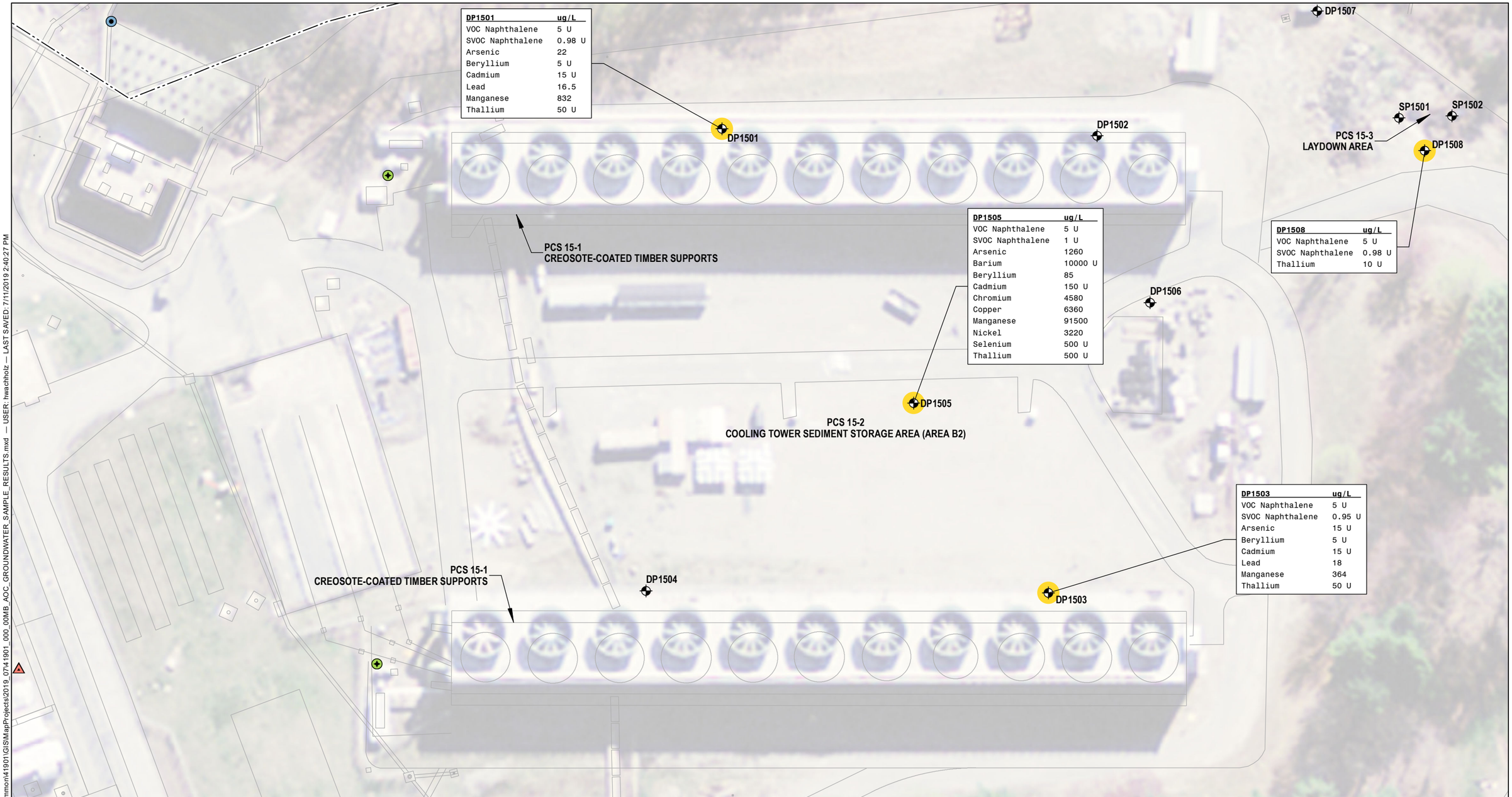


DP1501	ug/L
VOC Naphthalene	5 U
SVOC Naphthalene	0.98 U
Arsenic	22
Beryllium	5 U
Cadmium	15 U
Lead	16.5
Manganese	832
Thallium	50 U

DP1505	ug/L
VOC Naphthalene	5 U
SVOC Naphthalene	1 U
Arsenic	1260
Barium	10000 U
Beryllium	85
Cadmium	150 U
Chromium	4580
Copper	6360
Manganese	91500
Nickel	3220
Selenium	500 U
Thallium	500 U

DP1508	ug/L
VOC Naphthalene	5 U
SVOC Naphthalene	0.98 U
Thallium	10 U

DP1503	ug/L
VOC Naphthalene	5 U
SVOC Naphthalene	0.95 U
Arsenic	15 U
Beryllium	5 U
Cadmium	15 U
Lead	18
Manganese	364
Thallium	50 U

LEGEND

- ACTUAL SAMPLED LOCATION
- GROUNDWATER GRAB DATA FROM OPEN BORINGS EXCEEDING THE VT GES
- SITE BOUNDARY
- EXCLUSION AREA
- AOC 8 - TRANSFORMER (OUTSIDE BUILDINGS)
- AOC 11 - HAZARDOUS MATERIALS/WASTE STORAGE AREA (NON-RAD)
- AOC 14 - STORMWATER OUTFALL

NOTES

1. PCS = POTENTIAL CONTAMINANT SOURCE
2. VT GES = VERMONT GROUNDWATER ENFORCEMENT STANDARDS
3. U = NOT DETECTED, VALUE IS THE LABORATORY REPORTING LIMIT
4. AERIAL IMAGERY SOURCE: ESRI

0 60 120
SCALE IN FEET

HALEY ALDRICH

VERMONT YANKEE NUCLEAR POWER STATION
320 GOVERNOR HUNT ROAD
VERNON, VERMONT

AOC 15: COOLING TOWER AREA GROUNDWATER ANALYTICAL RESULTS EXCEEDING GROUNDWATER ENFORCEMENT STANDARDS

JULY 2019

FIGURE 5.15-3

GIS FILE PATH: \\haleyaldrich.com\share\bos_common\41901\GIS\MapProjects\2019_07\41901_000_00MB_AOC_GROUNDWATER_SAMPLE_RESULTS.mxd — USER: hwachholz — LAST SAVED: 7/11/2019 2:40:27 PM

LEGEND

- ACTUAL SAMPLED LOCATION
- SITE BOUNDARY
- EXCLUSION AREA
- RAILROAD
- AOC 7 - FUEL OIL STORAGE TANK
- AOC 8 - TRANSFORMER (OUTSIDE BUILDINGS)
- AOC 11 - HAZARDOUS MATERIALS/WASTE STORAGE AREA (NON-RAD)
- AOC 14 - STORMWATER OUTFALL

NOTES

1. PCS = POTENTIAL CONTAMINANT SOURCE
2. AERIAL IMAGERY SOURCE: ESRI

N

0 400 800
SCALE IN FEET

HALEY ALDRICH

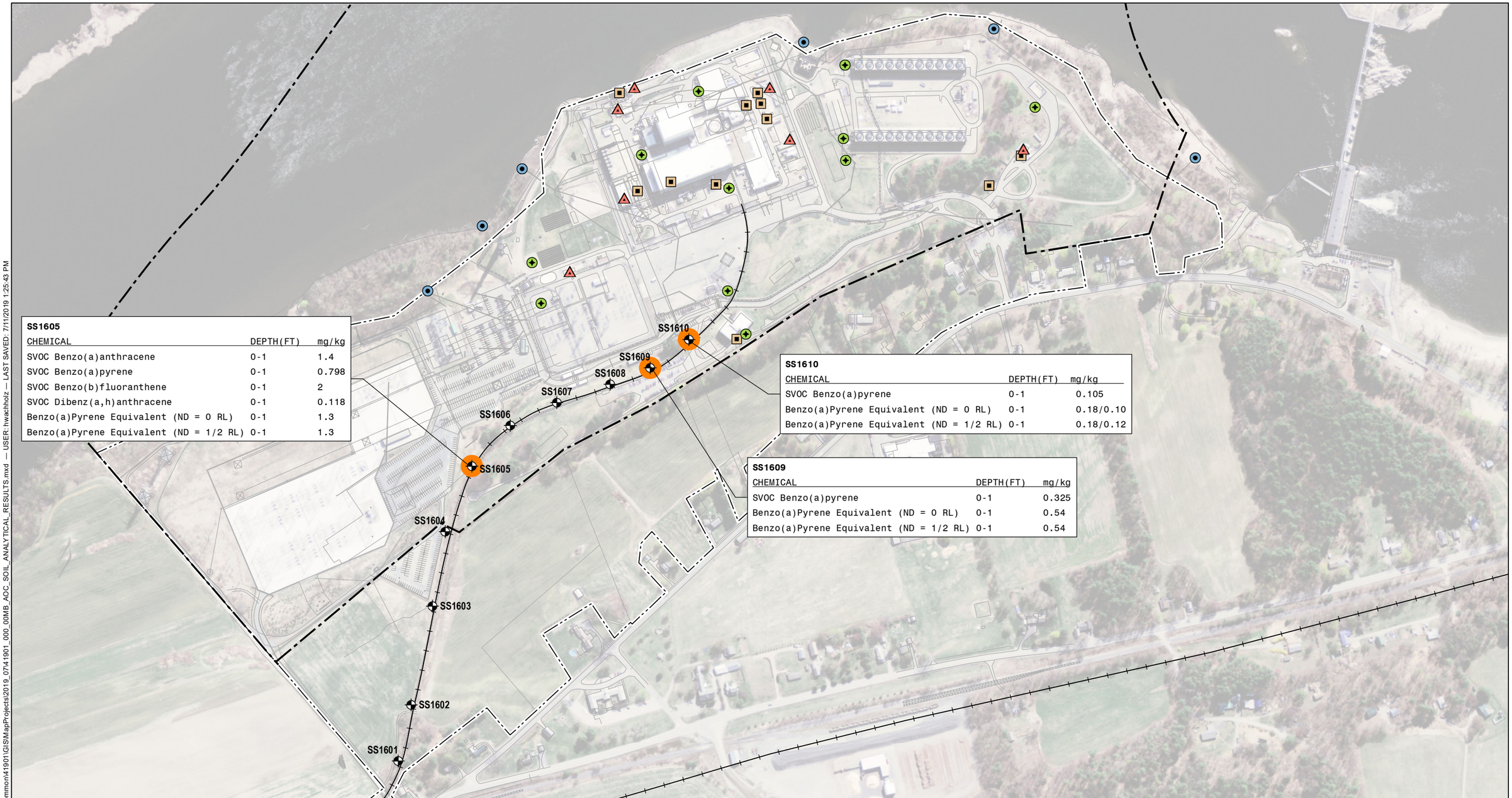
VERMONT YANKEE NUCLEAR POWER STATION
320 GOVERNOR HUNT ROAD
VERNON, VERMONT

AOC 16: RAILROAD LINES: SAMPLING LOCATIONS

JULY 2019

FIGURE 5.16-1

GIS FILE PATH: \\haleyaldrich.com\share\bos_common\41901\GIS\MapProjects\2019_0741901_000_00MB_AOC_PROPOSED_EXPLORATIONS.mxd — USER: hwachholz — LAST SAVED: 7/11/2019 1:11:11 PM



SS1605

CHEMICAL	DEPTH(FT)	mg/kg
SVOC Benzo(a)anthracene	0-1	1.4
SVOC Benzo(a)pyrene	0-1	0.798
SVOC Benzo(b)fluoranthene	0-1	2
SVOC Dibenz(a,h)anthracene	0-1	0.118
Benzo(a)Pyrene Equivalent (ND = 0 RL)	0-1	1.3
Benzo(a)Pyrene Equivalent (ND = 1/2 RL)	0-1	1.3

SS1610

CHEMICAL	DEPTH(FT)	mg/kg
SVOC Benzo(a)pyrene	0-1	0.105
Benzo(a)Pyrene Equivalent (ND = 0 RL)	0-1	0.18/0.10
Benzo(a)Pyrene Equivalent (ND = 1/2 RL)	0-1	0.18/0.12

SS1609

CHEMICAL	DEPTH(FT)	mg/kg
SVOC Benzo(a)pyrene	0-1	0.325
Benzo(a)Pyrene Equivalent (ND = 0 RL)	0-1	0.54
Benzo(a)Pyrene Equivalent (ND = 1/2 RL)	0-1	0.54

LEGEND

- ACTUAL SAMPLED LOCATION
- SOIL ANALYTICAL RESULTS EXCEEDING RESIDENTIAL AND NON-RESIDENTIAL SOIL CRITERIA
- SITE BOUNDARY
- EXCLUSION AREA
- RAILROAD
- AOC 7 - FUEL OIL STORAGE TANK
- AOC 8 - TRANSFORMER (OUTSIDE BUILDINGS)
- AOC 11 - HAZARDOUS MATERIALS/WASTE STORAGE AREA (NON-RAD)
- AOC 14 - STORMWATER OUTFALL

NOTES

1. / = DUPLICATE RESULT (PRIMARY/SECONDARY)
2. AERIAL IMAGERY SOURCE: ESRI

0 400 800
SCALE IN FEET

HALEY ALDRICH

VERMONT YANKEE NUCLEAR POWER STATION
320 GOVERNOR HUNT ROAD
VERNON, VERMONT

AOC 16: RAILROAD LINES:
SOIL ANALYTICAL RESULTS EXCEEDING RESIDENTIAL AND NON-RESIDENTIAL SOIL STANDARDS

JULY 2019

FIGURE 5.16-2

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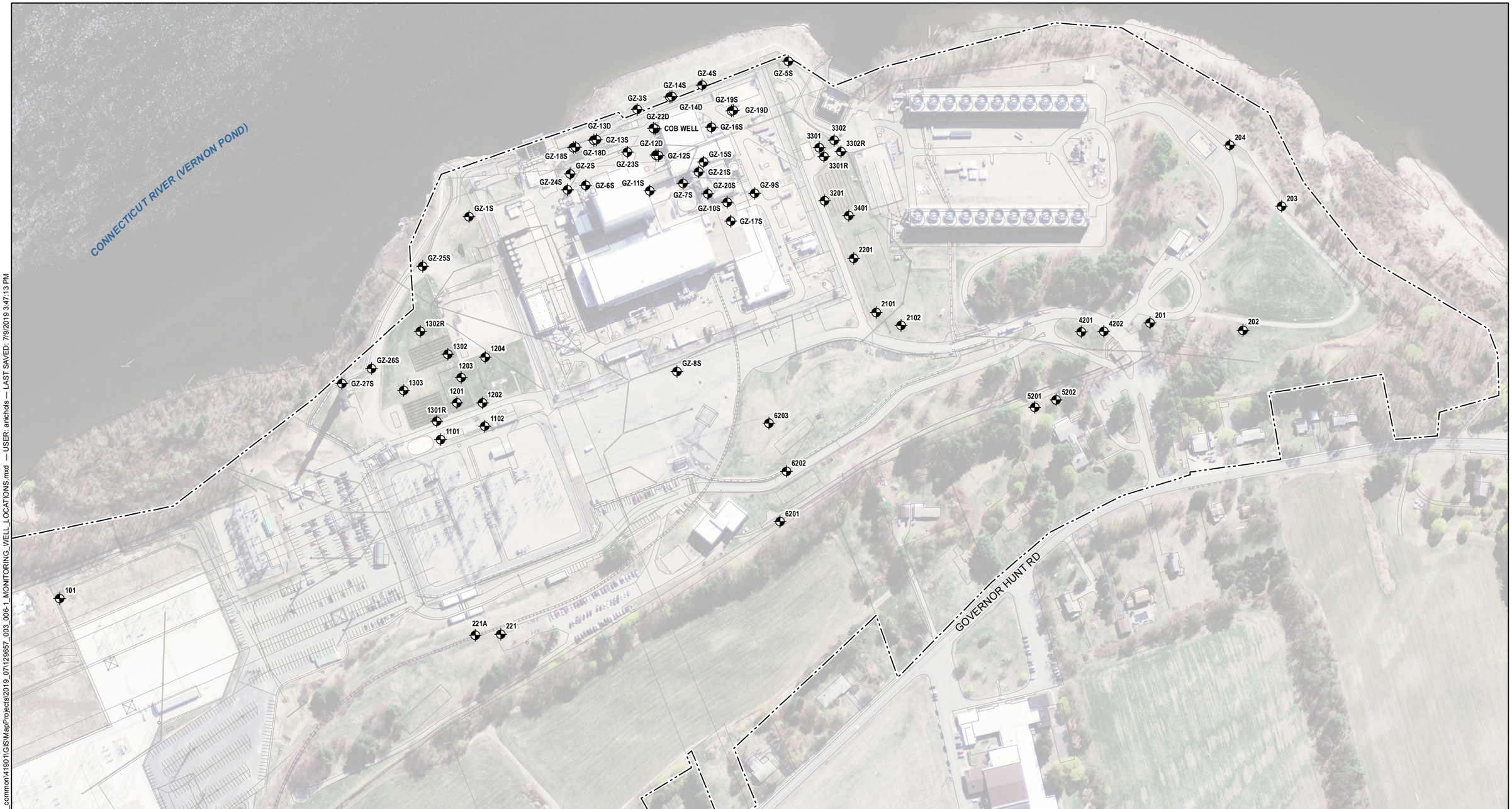


LEGEND

MONITORING WELL

SITE BOUNDARY

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. BASE MAP SOURCE: VERMONT YANKEE NUCLEAR POWER STATION
3. WELL LOCATION DATA SOURCE: PLAN TITLED, "SITE PLAN SHOWING EXPLORATION LOCATIONS, FIGURE 1.2," PREPARED BY GZA GEOENVIRONMENTAL, INC., MAY 2011.
4. AERIAL IMAGERY SOURCE: ESRI

0 250 500
SCALE IN FEET

HALEY ALDRICH

VERMONT YANKEE NUCLEAR POWER STATION
320 GOVERNOR HUNT ROAD
VERNON, VERMONT

MONITORING WELL LOCATIONS

JULY 2019

FIGURE 6-1

GIS FILE PATH: \\haleyaldrich.com\share\bos_common\41901\GIS\MapProjects\2019_07\129657_003_006-1_MONITORING_WELL_LOCATIONS.mxd — USER: anichols — LAST SAVED: 7/9/2019 3:47:13 PM

LEGEND

- MONITORING WELL WITH GROUNDWATER ELEVATION, IN FEET
- MONITORING WELL NOT SAMPLED
- GROUNDWATER ELEVATION CONTOUR, 5-FT INTERVAL
- SITE BOUNDARY

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. BASE MAP SOURCE: VERMONT YANKEE NUCLEAR POWER STATION
3. WELL LOCATION DATA SOURCE: PLAN TITLED, "SITE PLAN SHOWING EXPLORATION LOCATIONS, FIGURE 1.2," PREPARED BY GZA GEOENVIRONMENTAL, INC., MAY 2011.
4. AERIAL IMAGERY SOURCE: ESRI

0 250 500
SCALE IN FEET

HALEY ALDRICH

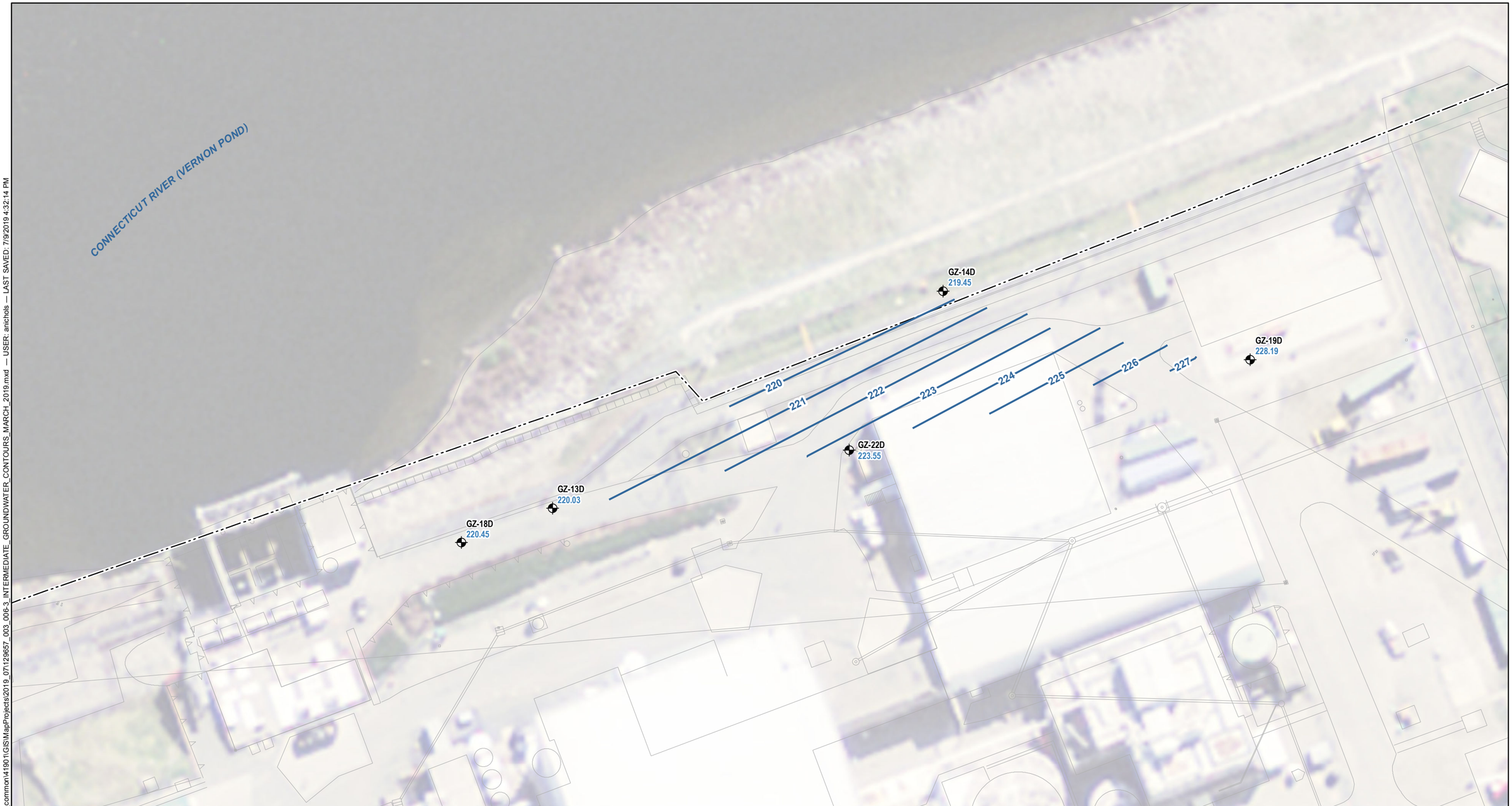
VERMONT YANKEE NUCLEAR POWER STATION
320 GOVERNOR HUNT ROAD
VERNON, VERMONT

SHALLOW GROUNDWATER CONTOURS (MARCH 2019)

JULY 2019

FIGURE 6-2

GIS FILE PATH: \\haleyaldrich.com\share\bos_common\41901\GIS\MapProjects\2019_07\129657_003_006-2_SHALLOW_GROUNDWATER_CONTOURS_MARCH_2019.mxd — USER: anichols — LAST SAVED: 7/10/2019 11:16:12 AM



LEGEND

- MONITORING WELL WITH GROUNDWATER ELEVATION, IN FEET
- GROUNDWATER ELEVATION CONTOUR, 1-FT INTERVAL
- SITE BOUNDARY

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. BASE MAP SOURCE: VERMONT YANKEE NUCLEAR POWER STATION
3. WELL LOCATION DATA SOURCE: PLAN TITLED, "SITE PLAN SHOWING EXPLORATION LOCATIONS, FIGURE 1.2," PREPARED BY GZA GEOENVIRONMENTAL, INC., MAY 2011.
4. AERIAL IMAGERY SOURCE: ESRI

N

0 50 100
SCALE IN FEET

HALEY ALDRICH

VERMONT YANKEE NUCLEAR POWER STATION
320 GOVERNOR HUNT ROAD
VERNON, VERMONT

INTERMEDIATE GROUNDWATER CONTOURS (MARCH 2019)

JULY 2019

FIGURE 6-3

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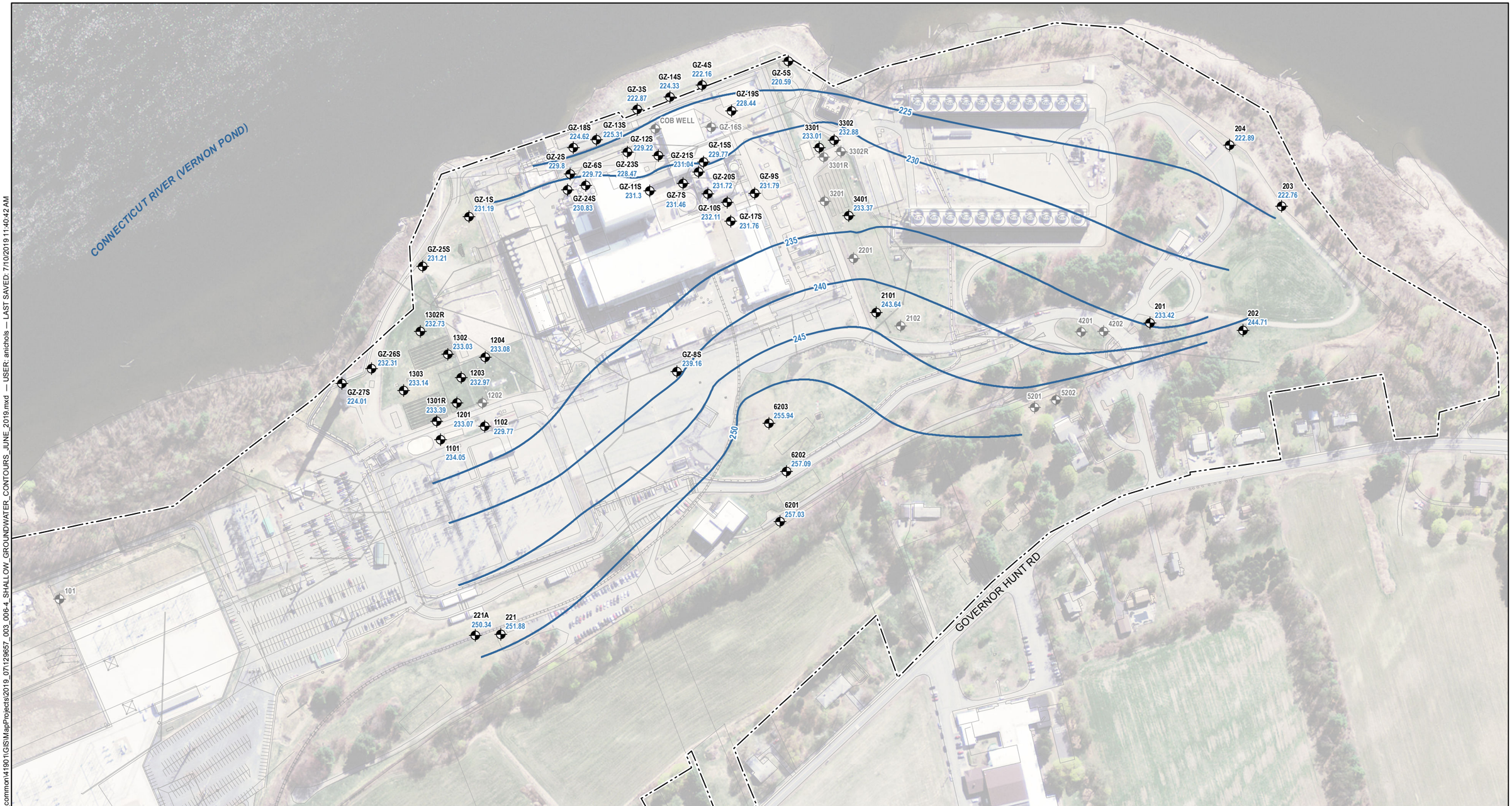


LEGEND

- MONITORING WELL WITH GROUNDWATER ELEVATION, IN FEET
- MONITORING WELL NOT SAMPLED
- GROUNDWATER ELEVATION CONTOUR, 5-FT INTERVAL
- SITE BOUNDARY

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. BASE MAP SOURCE: VERMONT YANKEE NUCLEAR POWER STATION
3. WELL LOCATION DATA SOURCE: PLAN TITLED, "SITE PLAN SHOWING EXPLORATION LOCATIONS, FIGURE 1.2," PREPARED BY GZA GEOENVIRONMENTAL, INC., MAY 2011.
4. AERIAL IMAGERY SOURCE: ESRI

N

0 250 500
SCALE IN FEET

HALEY ALDRICH

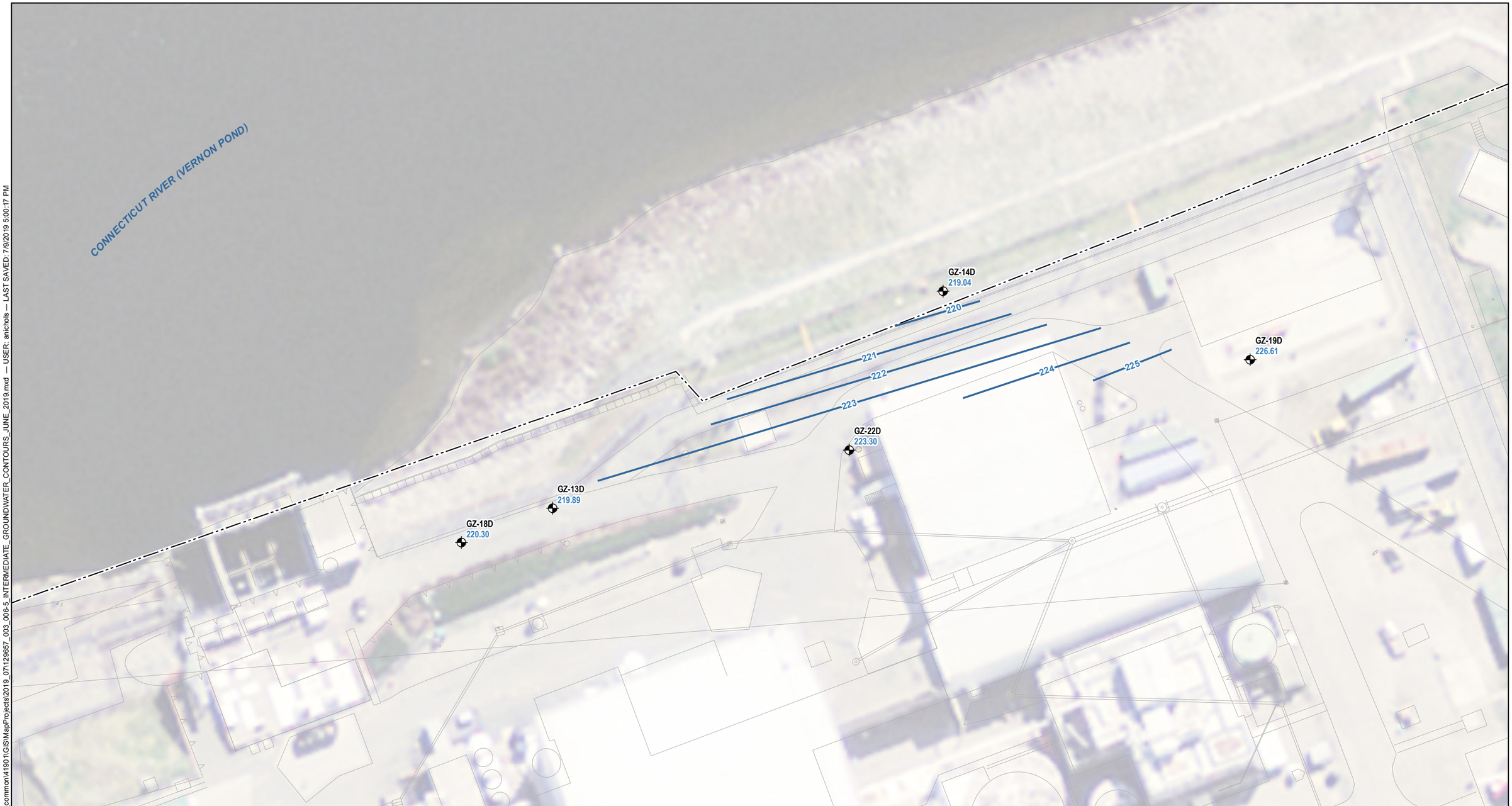
VERMONT YANKEE NUCLEAR POWER STATION
320 GOVERNOR HUNT ROAD
VERNON, VERMONT

SHALLOW GROUNDWATER CONTOURS (JUNE 2019)

JULY 2019

FIGURE 6-4

GIS FILE PATH: \\haleyaldrich.com\share\bos_common\41901\GIS\MapProjects\2019_071129657_003_006-4_SHALLOW_GROUNDWATER_CONTOURS_JUNE_2019.mxd — USER: anichols — LAST SAVED: 7/10/2019 11:40:42 AM



LEGEND

- MONITORING WELL WITH GROUNDWATER ELEVATION, IN FEET
- GROUNDWATER ELEVATION CONTOUR, 1-FT INTERVAL
- SITE BOUNDARY

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. BASE MAP SOURCE: VERMONT YANKEE NUCLEAR POWER STATION
3. WELL LOCATION DATA SOURCE: PLAN TITLED, "SITE PLAN SHOWING EXPLORATION LOCATIONS, FIGURE 1.2," PREPARED BY GZA GEOENVIRONMENTAL, INC., MAY 2011.
4. AERIAL IMAGERY SOURCE: ESRI

N

0 50 100
SCALE IN FEET

HALEY ALDRICH

VERMONT YANKEE NUCLEAR POWER STATION
320 GOVERNOR HUNT ROAD
VERNON, VERMONT

INTERMEDIATE GROUNDWATER CONTOURS (JUNE 2019)

JULY 2019

FIGURE 6-5

GIS FILE PATH: \\haleyaldrich.com\share\bos_common\41901\GIS\MapProjects\2019_071129657_003_006-5_INTERMEDIATE_GROUNDWATER_CONTOURS_JUNE_2019.mxd — USER: anichols — LAST SAVED: 7/8/2019 5:00:17 PM

LEGEND

- SAMPLING LOCATION WITH EXCEEDANCE OF VERMONT GROUNDWATER ENFORCEMENT STANDARDS (VT GES)
- GROUNDWATER DATA FROM MONITORING WELLS
- GROUNDWATER GRAB DATA FROM OPEN BORINGS
- SITE BOUNDARY

NOTES

1. ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE.
2. BASE MAP SOURCE: VERMONT YANKEE NUCLEAR POWER STATION
3. WELL LOCATION DATA SOURCE: PLAN TITLED, "SITE PLAN SHOWING EXPLORATION LOCATIONS, FIGURE 1.2", PREPARED BY GZA GEOENVIRONMENTAL, INC., MAY 2011.
4. SAMPLING RESULTS FROM MAY 2019.
5. AERIAL IMAGERY SOURCE: ESRI

N

0 250 500
SCALE IN FEET

HALEY ALDRICH

VERMONT YANKEE NUCLEAR POWER STATION
320 GOVERNOR HUNT ROAD
VERNON, VERMONT

GROUNDWATER SAMPLING RESULTS EXCEEDING VT GES

JULY 2019

FIGURE 6-6

GIS FILE PATH: \\haleyaldrich.com\share\bos_common\41901\GIS\MapProjects\2019_07\129657_003_006-6_GROUNDWATER_SAMPLING_RESULTS.mxd — USER: anichols — LAST SAVED: 7/9/2019 5:18:20 PM

APPENDIX A

Pertinent Correspondence

APPENDIX A
PERTINENT CORRESPONDENCE

1. 19 February 2019. Email from Nadia Glucksberg to Gerold Noyes. Subject: Vermont Yankee Site Investigation Work Plans and QAPP (Link provided to relevant documents)

2. 21 February 2019. Email from Nadia Glucksberg to Gerold Noyes. Subject: 2018-0927-HAI_Table 401-2 Inv-revised.pdf. (Attachment: subject file0

3. 4 March 2019. Email from Nadia Glucksberg to Gerold Noyes. Subject: SVY-19-009 Investigation Overview. (Attachment: Presentation given on 28 February 2019 to ANR)

4. 4 April 2019. Email from Gerold Noyes to Nadia Glucksberg. Subject: Please see the attached letters reviewing the Haley & Aldrich site investigation workplans for NorthStar Vermont Yankee. (Attachments: ANR and ATC comments on Work Plans)

5. 18 April 2019. Email from Nadia Glucksberg to Gerold Noyes. Subject: 2019 NNDC Vermont Yankee Schedule 4/18/2019.pdf (Attachment: Subject File)

6. 4 May 2019. Email from Nadia Glucksberg to Gerold Noyes. Subject: 2019-0503 VY WP and QAPP submittal letter.pdf (Attachment, Subject file and link to documents)

7. 21 June 2019. Email transmittal of approval letter from Gerold Noyes (VT DEC) to Nadia Glucksberg (Haley & Aldrich). Subject: Vermont Yankee work plan approvals.

Glucksberg, Nadia

From: Glucksberg, Nadia
Sent: Tuesday, February 19, 2019 11:41 AM
To: Noyes, Gerold
Cc: breid@NorthStar.com; Langub, Nelson; Di Carlo, Gregory; CDaniels@Northstar.com; van Noordennen, Miles; Danaher, Elida; Schwer, Chuck; Simoes, Steve; Fekert, Dennis; Walke, Peter; Gonda, Jordan
Subject: Vermont Yankee Site Investigation Work Plans and QAPP.
Attachments: PG LEP Nadia Glucksberg.vcf

Hi Gerold:

As we discussed during our meeting on Feb 12, we have combined the different Investigation Work Plans required by the MOU into one overarching document and are formally submitting them for ANR review/comment. We have also provided the stand alone Quality Assurance Project Plan as a supplemental document to support the program. You will note that other than the addition of the Groundwater Monitoring Work Plan, the other documents have not changed scientifically or at all.

The following link may be accessed by you or your consultants, however if you would rather we upload the documents to a specific site, we are happy to oblige.

https://haleyaldrich.sharefile.com/d-sefabfca5f9d4fbe9

We understand that our goal is to accelerate the schedule to allow us to complete the Field Investigation and Report by July 11. With that, we can be available at your convenience to present our proposed scope of work & sampling rationale and to work through any questions or comments that you may have. Because of the amount of information provided, I would think a day (or ½ day) for our first meeting would be helpful and we can meet either in Montpelier or at VY.

Please feel free to reach out to any of us if you have any questions and we look forward to working with your team. Also, I have cc'd the entire group, but if there are others that should be include/excluded, just let us know.

Nadia

Nadia Glucksberg, PG, LEP
Haley & Aldrich, Inc.
75 Washington Ave, Suite 1A
Portland, ME 04101
Office: 207.482.4623
Cell: 207.632.4016
nglucksberg@haleyaldrich.com

Glucksberg, Nadia

From: Glucksberg, Nadia
Sent: Thursday, February 21, 2019 10:06 AM
To: Noyes, Gerold
Subject: RE: table 4.0-2 request
Attachments: 2017-0927-HAI_Table 4.0-2 AOC Inv-revised.pdf

Hi Gerold

The attached table was published in our Historical Site Characterization Report that was a precursor to the Work Plan. Not required by the MOU, but sets up the AOCs.

That said, the AOC descriptions as well as the Site History and Setting were all republished in the Work Plan that you are currently reviewing, but we can provide the initial summary report if you wish.

Nadia

From: Noyes, Gerold <Gerold.Noyes@vermont.gov>
Sent: Thursday, February 21, 2019 9:51 AM
To: Glucksberg, Nadia <NGlucksberg@haleyaldrich.com>
Subject: table 4.0-2 request

Good morning Nadia,

When you get a chance could you please send a copy of Table 4.0-2, 'Summary of AOC Investigations' ?

Gerold Noyes, PE

VERMONT
Department of Environmental Conservation
Sites Management Section
1 National Life Drive – Davis 1
Montpelier, VT 05620-3704

Gerold.noyes@vermont.gov
(802) 522-5614

TABLE 4.0-2
SUMMARY OF AOC INVESTIGATIONS
HISTORICAL SITE CHARACTERIZATION REPORT
VERMONT YANKEE NUCLEAR POWER STATION

AOC No.	VANR AOC No.	PCS No.	AREAS OF CONCERN (AOCs)[1]	AOC LOCATION/DESCRIPTION	2001 PHASE I & II ESA STATUS[2]	2001 PHASE I & II RECOGNIZED ENVIRONMENTAL CONDITION[2]	2014 HSA AOC STATUS[3]	OTHER INVESTIGATIONS	2017 PHASE I ESA[4]	SUMMARY OF INVESTIGATIONS	FINDINGS/STATUS	ADDITIONAL INVESTIGATION REQUIRED
345 kV Switchyard												
1		1	345 kV Switchyard	345 kV Switchyard	Perimeter curtain drains to outfall north of the North Storm Water System Outfall	Yes, Phase II sampling performed	All equipment is the switchyard is now owned by VELCO, while the land is owned by Entergy. Sorbent pads are visible beneath a transformer in the switchyard.	In 2009, TRC performed a Phase I of the parcel on behalf of VELCO. Phase II activities were performed in March 2009.		A wastewater sample was collected from the switchyard curtain drainage system during the 2001 Phase II and analyzed for PCBs and TPH. In 2009, samples were collected from the 5 dry wells located within the switchyard.	Results of the 2001 Phase II wastewater sample did not contain concentrations of TPH or PCBs above MDLs. Results of the 2009 Phase II samples from the dry wells contained concentrations of TPH exceeding the VT Soil Reuse Criteria of 1,000 mg/kg. These dry wells were identified as RECs.	Yes. Documented releases and impacts.
1		1-1	Auto Transformer	On concrete pad within the 345 kV Switchyard with 17,200-gallon capacity of non-PCB oil.	No staining observed.	Yes, Phase II sampling performed	No staining observed.			As part of the 2001 Phase II, a composite soil sample was collected adjacent to the transformer and analyzed for PCBs.	PCBs were not detected above MDLs in the soil sample.	Yes, to determine if any releases have occurred.
1		1-3	Spare Main Transformer	East of the 345 kV Switchyard; it had a 26,500-gallon capacity of non-PCB oil.	Weathered staining observed in the vicinity of the transformer. No active leak observed. Drains to separator MH-A	Yes, Phase II sampling performed	Transformer oil leaking on to the ground. This transformer was removed from the site in 2007.			As part of the 2001 Phase II, a grab soil sample was collected adjacent to the Main Transformer and analyzed for PCBs.	The PCB-1260 was detected at 200 ug/kg in soil	Yes, additional samples will be required to delineate the PCB impacts to soil.
115 kV Switchyard												
2		2	115 kV Switchyard	115 kV Switchyard	Perimeter curtain drain drains to two outfalls discharging to the CT River north of the 345 kV switchyard outfall. Two half-buried empty rusted drums were observed on the embankment of the river. The drums were removed in May 2001.	Yes, Phase II sampling performed	All equipment in the switchyard is now owned by VELCO, while the land is owned by Entergy. No staining observed.			Four soil samples were collected from the 115 kV Switchyard outfall of the curtain drainage system as part of the 2001 Phase II. Samples were analyzed for TPH and PCBs.	TPH was detected in all four soil samples at concentrations ranging from 87 mg/kg to 250 mg/kg. PCBs were not detected above MDL in any of the samples.	Yes. Documented releases and impacts.
2		2-2	Keene Line Breaker	On concrete pad within the 115 kV Switchyard	No soil staining observed.		No staining observed.				No evidence of a release	Yes, to determine if any releases have occurred.
2		2-3	Bus Line Breaker	On concrete pad within the 115 kV Switchyard	No soil staining observed.		No staining observed.				No evidence of a release	Yes, to determine if any releases have occurred.
2		2-4	Coolidge Line Breaker	On concrete pad within the 115 kV Switchyard	No soil staining observed.		No staining observed.				No evidence of a release	Yes, to determine if any releases have occurred.
N/A	13	N/A	VELCO Substation	VELCO Substation	Not constructed at time of Phase I/II		All equipment in the switchyard is now owned by VELCO, while the land is owned by Entergy. No staining observed.					No. Active substation to remain. Will be address with downgradient explorations performed at other AOCs

TABLE 4.0-2
SUMMARY OF AOC INVESTIGATIONS
HISTORICAL SITE CHARACTERIZATION REPORT
VERMONT YANKEE NUCLEAR POWER STATION

AOC No.	VANR AOC No.	PCS No.	AREAS OF CONCERN (AOCs)[1]	AOC LOCATION/DESCRIPTION	2001 PHASE I & II ESA STATUS[2]	2001 PHASE I & II RECOGNIZED ENVIRONMENTAL CONDITION[2]	2014 HSA AOC STATUS[3]	OTHER INVESTIGATIONS	2017 PHASE I ESA[4]	SUMMARY OF INVESTIGATIONS	FINDINGS/STATUS	ADDITIONAL INVESTIGATION REQUIRED
Former South Warehouse												
3		3	South Warehouse	Former Flammable Materials Cage	Area properly labeled and in good condition; No leaks or damaged containers observed		No staining or damaged containers observed.					Yes, to determine current conditions and if any releases have occurred.
3		3-1, 3-2, 3-6, and 3-7	South Warehouse	Chemicals and batteries were stored and used within the South Warehouse	Area properly labeled and in good condition; No leaks or damaged containers observed		Vehicle maintenance was performed at the site of the South Warehouse during plant construction. Petroleum products related to that activity may be present in the soil or groundwater. Approximately 2,000 gallons of virgin and waste oils are stored in steel 55-gallon drums within a containment berm at the east end of the building. Drums are in good condition, with no evidence of spills or leaks. Lead acid batteries are charged and stored in a locked battery work cage in southwest corner of the building.					Yes, need to determine current conditions.
3		3-3	1,000-gallon Gasoline UST	UST was northeast of the South Warehouse Building	Installed in 1997, UST was used to store fuel for vehicles. It passed an April 2001 leak test and was routinely inspected by the ANR. It also had a Veeder Root interstitial monitoring system. Weekly leak testing was performed.	Yes, Phase II explorations performed	The UST was double-walled and had a Veeder-Root automatic monitoring system. It was converted from gasoline to diesel in September 2001. VT UST Program ID No. 806.			Two soil samples and one GW sample were collected from the Gasoline/Diesel UST vicinity (GD-B1 & GD-B2) during the 2001 Phase II. Samples were analyzed for VOCs and TPH.	Concentrations of VOCs and TPH were not detected above MDLs in soil. In GW, the VOC 1,2,4-Trimethylbenzene was detected at 1.4 ug/L. No other VOCs were detected. TPH was not detected.	Yes, gasoline constituent detected. Determine current conditions.
3		3-4	550-gallon Diesel UST	UST was northeast of the South Warehouse Building	Installed in 1997, UST was used to store fuel for vehicles. It passed an April 2001 leak test and was routinely inspected by the ANR. It also had a Veeder Root interstitial monitoring system. Weekly leak testing was performed.	Yes, Phase II explorations performed	Tank is double-walled and has a Veeder-Root automatic monitoring system. VT UST Program ID No. 806					Yes, to determine if any releases have occurred.
3		3-5	1,000-gallon Portable Diesel AST	Double-walled portable AST located north of the northeast corner of the South Warehouse when not in use.	No discussed		Tank appears to be well maintained and in good condition with no visible evidence of a release.		In use at various locations around the plant according to Normandeau in 2017 Phase I			Yes, to determine if any releases have occurred.
3		3-6 and 16	Former Waste Oil UST	This tank was located in the former CAB, which was replaced by the current CAB.	Former 1,000-gallon UST	Yes, Phase II explorations performed	Drained, cleaned and removed from site. Reportedly no associated contaminated soil.			A soil sample and a groundwater sample was collected in the vicinity of the former UST location during the 2001 Phase II. The soil sample was analyzed for VOCs, TPH, PAHs, PCBs, and total 13 PP metals. The groundwater sample was analyzed for VOCs, TPH, PAHs, PCBs, dissolved 13 PP metals and radiological parameters.	No concentrations of VOCs, TPH, PAHs or PCBs were detected in the soil above MDLs. Metal concentrations were within background ranges. TPH was detected at 0.65 mg/L in the groundwater. No VOCs, PAHs, PCBs or dissolved metals were detected above MDLs in groundwater.	Yes, TPH impacts noted.
Former North Warehouse												
4		4	500-gallon Diesel AST	Double-walled portable AST located under a roof adjacent to the salt shed in the Main Parking Lot.	All ASTs have secondary containment including double-walled construction. No evidence of a release observed.		Tank appears to be well maintained and in good condition with no visible evidence of a release.					No
4		4-2	500-gallon Waste Oil AST	Located in the North Warehouse	All ASTs have secondary containment including double-walled construction. No evidence of a release observed.		Heavy gauge steel tank with secondary containment. Radiologically contaminated waste oil was burned for space heating in the North Warehouse from approx. 1995 to 2011. Unburned particles may have accumulated on the north roof and ground beneath the drip line.	Tank removed in 2016 when the North Warehouse was demolished.			Tank has been removed. Pre and post building demolition investigations were conducted of this area. No evidence of a release was observed. No further action recommended.	No

TABLE 4.0-2
SUMMARY OF AOC INVESTIGATIONS
HISTORICAL SITE CHARACTERIZATION REPORT
VERMONT YANKEE NUCLEAR POWER STATION

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4		4-3	550-gallon Diesel UST (John Deere Diesel Generator Building)	Located adjacent to the John Deere Diesel Generator Building.	Installed in 1997, UST was used to store fuel for vehicles. It passed an April 2001 leak test and was routinely inspected by the ANR. It also had a Veeder Root interstitial monitoring system. Weekly leak testing was performed.	Yes, Phase II explorations performed	Tank is double-walled and has a Veeder-Root automatic monitoring system. VT UST Program ID No. 806	On 2 November 2016, Haley & Aldrich oversaw the removal of this UST. The UST appeared to be in good condition. Soils were screened using a PID. Confirmatory soil samples were collected from excavation sidewalls and beneath fuel pipes. Samples were analyzed for VOCs and TPH (DRO). No visual evidence of a release was observed.		During the 2001 Phase II, two soil samples were collected from the vicinity of the UST. Samples were analyzed for VOCs and TPH. No VOCs were detected above MDLs. TPH was detected at 34 mg/kg in one of the two samples. No VOCs were detected in the confirmatory soil samples collected during tank removal and closure activities. Low levels of diesel range organics (DRO) <17 mg/kg were reported.	Closed. A UST Closure Report was filed with the UST Program of VANR by Haley & Aldrich on 15 November 2016 on behalf of Entergy.	No. UST removed. Confirmatory samples collected and in compliance.
4		4-4	North Warehouse (RCRA Wastes)	Designated area within North Warehouse for chemical storage	Area properly labeled and in good condition; No leaks or damaged containers observed		Various pieces of radiologically contaminated equipment are stored throughout the building, in addition to spent lead-acid batteries, used ethylene glycol, PCB-containing items (such as fluorescent lamp ballasts and small low-voltage capacitors) and waste computer parts. (2) storage cabinets for flammable materials are located on south wall. Material properly labeled and in good condition. No leaks or damaged containers observed. The North Warehouse is a RCRA permitted hazardous waste storage area.	In November 2016, the North Warehouse was demolished. Building materials, surface and subsurface soils were characterized prior to and following building demolition.		Five surface soil samples and seven subsurface soil samples were collected from within and adjacent to the footprint of the North Warehouse. Samples were analyzed for VOCs, SVOCs, PCBs, total & SPLP metals. Select samples were also analyzed for polychlorinated dibenzodioxins/polychlorinated dibenzofurans, pesticides and herbicides. Three samples of the sediment accumulated in draining pipes from the warehouse floor drains were also collected. These samples were analyzed for VOCs, SVOCs, PCBs, total and SPLP metals.	No analytical results exceeded regulatory criteria. Evidence of releases (i.e. staining, odors) were not observed. Details are provided in the August 2017 "Final North Warehouse Soil Characterization Report, Revision 1" prepared by Haley & Aldrich.	No. No evidence of releases.
Turbine Building												
5		5-1	12,000-gallon No. 2 Fuel Oil AST	Located in the vicinity of the former 5,000-gallon House Heating Boiler Fuel UST	All ASTs have secondary containment including double-walled construction. No evidence of a release observed.		Double-walled tank installed in 1995 with Veeder-Root automatic monitoring system. Tank and underground piping cathodically protected. No visible indication of leaks or spills.		Reported as active in the 2017 Phase I by Normandeau.			Yes, to determine if any releases have occurred.
5	1	5-2 and 5-3	Former 5,000-gallon Fuel Oil UST	House Heating Boiler Fuel Oil UST west side of Turbine Building; removed in 1994	TPH and VOCs (BTEX and Chlorinated Solvents PCE and TCE) exceeded the VT PGQS. Free-phase oil was present in 2 of 9 MWs. Groundwater monitoring was in progress and approved by VTDEC (SMS Site No. 99-2617).	Yes, Phase II sampling performed	VTDEC issued a SMAC designation on 16 September 2008 effectively closing the spill although low levels of fuel oil constituents and solvents were still detectable. The 9 MWs associated with this spill were abandoned. The buried fill pipe to the UST runs more than 200 ft. from the fuel oil pump room, under the New Warehouse to the UST. When the UST was removed, the fill pipe failed a pressure test. The fill pipe was blanked off but not removed because of overlying structures. Fuel oil may have leaked to soil and groundwater from the fill pipe in inaccessible areas that were not investigated.	According to the SMAC letter issued by VANR on 16 September 2008, there were several phases of investigation conducted in this area including a 1999 Phase II Environmental Report prepared by McLaren Hart. Several GW monitoring events followed this investigation, conducted on a quarterly, semi-annual and annual basis since 1999.		During the 2001 Phase II, nine groundwater samples were collected from existing MWs in this area. Samples were analyzed for VOCs, TPH, PCBs and radiological parameters.	In 2001, several petroleum related VOCs and chlorinated solvents PCE and TCE were detected in groundwater as well as TPH. No PCBs were detected above MDLs. Groundwater monitoring has been conducted on a regular (quarterly, semi-annual and then annual basis) since 1999. On 16 September 2008, VANR issued a Sites Management Activity Complete (SMAC) designation letter for this area. As part of this SMAC, a Notice to Land Records was recorded on 2 September 2008 to the Vernon Town Offices regarding the residual soil and groundwater contamination in the UST vicinity.	Additional investigation and remediation may be required following Turbine Building demolition. Prior to conducting any subsurface work in this area VNAR must be notified.

TABLE 4.0-2
SUMMARY OF AOC INVESTIGATIONS
HISTORICAL SITE CHARACTERIZATION REPORT
VERMONT YANKEE NUCLEAR POWER STATION

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5		5-4	11,000-gallon Lube Oil AST	Located in lube oil pump room of the Turbine Building	All ASTs have secondary containment including double-walled construction. No evidence of a release observed.		Lube oil tank appears to be well maintained and in good condition, with no visible indication of leaks or spills. The pump room also contained drums and containers of virgin turbine lube oil as well as safety cans of waste oil. Containers appeared to be in good condition.		Empty, no longer in use according to 2017 Phase I by Normandeau		Tank was within secondary containment and inside the building. Area will be visually inspected. If staining is observed, concrete chip samples may be collected for characterization.	Yes, to determine if any releases have occurred.
5		5-5	Two 800-gallon Diesel Generator Day Tanks (ASTs)	Located in the Turbine Building	All ASTs have secondary containment including double-walled construction. No evidence of a release observed.				Empty, no longer in use according to 2017 Phase I by Normandeau		Tanks are in secondary containment and inside the building. Area will be visually inspected. If staining is observed, concrete chip samples may be collected for characterization.	Yes, to determine if any releases have occurred.
5		5-5	Two 275-gallon Diesel Generator Lube Oil ASTs	Located in diesel generator rooms	All ASTs have secondary containment including double-walled construction. No evidence of a release observed.		Tanks appear to be well maintained and in good condition with no visible evidence of a release.		Empty, no longer in use according to 2017 Phase I by Normandeau		Tanks are in secondary containment and inside the building. Area will be visually inspected. If staining is observed, concrete chip samples may be collected for characterization.	Yes, to determine if any releases have occurred.
5		5-6	Turbine Building -West Side	Inside roll-up door in Turbine Building	Area properly labeled and in good condition; No leaks or damaged containers observed		Virgin resin in chemical storage cabinets. Former location of dry cleaning operation.					Yes, evaluation to determine if COCs have been released to environmental media. If a pathway exists, soils immediately adjacent to or below shall be characterized. Sub-floor characterization will be coordinated with the building demolition.
5	4	5-6 and 16	Dry Cleaning Operations - Turbine Building	Located in a truck bay of the Turbine Building from approx. 1982 to 1985, dry cleaning was used to clean protective clothing worn in the Radiologically Controlled Area.	Not Discussed		Used to clean protective clothing warn in the RCA from approx. 1982 to 1985.				Low concentrations of chlorinated solvents were detected in groundwater monitored at the site of the leaking 5,000-gallon fuel oil UST outside the Turbine Building truck bay.	Yes, additional samples will be required to delineate solvent impacts
5		5-7	Turbine Building Machine Shop	Turbine Building	Area properly labeled and in good condition; No leaks or damaged containers observed		(1) flammable materials storage cabinet, (1) non-flammable materials storage cabinet, (1) parts washer, (1) oily rag storage can, (1) cart containing welding/cutting gas cylinders. No visible leaking or damaged containers.					Yes, evaluation to determine if COCs have been released to environmental media. If a pathway exists, soils immediately adjacent to or below shall be characterized. Sub-floor characterization will be coordinated with the building demolition.

TABLE 4.0-2
SUMMARY OF AOC INVESTIGATIONS
HISTORICAL SITE CHARACTERIZATION REPORT
VERMONT YANKEE NUCLEAR POWER STATION

AOC No.	VANR AOC No.	PCS No.	AREAS OF CONCERN (AOCs)[1]	AOC LOCATION/DESCRIPTION	2001 PHASE I & II ESA STATUS[2]	2001 PHASE I & II RECOGNIZED ENVIRONMENTAL CONDITION[2]	2014 HSA AOC STATUS[3]	OTHER INVESTIGATIONS	2017 PHASE I ESA[4]	SUMMARY OF INVESTIGATIONS	FINDINGS/STATUS	ADDITIONAL INVESTIGATION REQUIRED
5	3	5-8	Turbine Building - Chemistry Laboratory	Within the Turbine Building	Area was noted to be properly labeled and in good condition, with no leaks or damaged containers observed. The leaking drain pipe discovered in 1991 was not discussed.		Drain pipe from chemistry lab sink was discovered to be leaking under the floor slab in 1991. Pipe was abandoned in place. Limited subsurface investigation showed radionuclides to be present in soil beneath the floor but no non-rad contaminants. 10 CFR 20.302 permit application made to NRC in 1991 to leave low levels of radionuclides in place. Application approved by NRC March 7, 1996 and published "Finding of No Significant Impact" in Federal Register (61 CFR 8984).					Yes, evaluation to determine if COCs have been released to environmental media. If a pathway exists, soils immediately adjacent to or below shall be characterized. Sub-floor characterization will be coordinated with the building demolition.
5		5-9	T-6-1A Transformer	Located in Turbine Building, in the vicinity of the sample sink on elevation 248 ft. It has 215-gallon capacity of non-PCB oil	Within secondary containment berm, no staining observed.		Surrounded by concrete containment dike. No staining observed.				No evidence of a release	Yes, visual inspection. If staining is observed, concrete chip samples may be collected for characterization.
5		5-9	T-7-1A System Transformer	Located in Turbine Building, near make up deminerlizer system at elevation 248 ft. It has 215-gallon capacity of non-PCB oil	Within secondary containment berm, no staining observed.		Surrounded by concrete containment dike. No staining observed.				No evidence of a release	Yes, visual inspection. If staining is observed, concrete chip samples may be collected for characterization.
5		5-9	T-8-1A Transformer	Located in Control Room. It has 215-gallon capacity of non-PCB oil.	Within secondary containment berm, no staining observed.		Surrounded by concrete containment dike. No staining observed.				No evidence of a release	Yes, visual inspection. If staining is observed, concrete chip samples may be collected for characterization.
5		5-9	T-9-1A Transformer	Located in the switchgear room of the Control Building. It has 215-gallon capacity of non-PCB oil.	Within secondary containment berm, no staining observed.		Surrounded by concrete containment dike. No staining observed.				No evidence of a release	Yes, visual inspection. If staining is observed, concrete chip samples may be collected for characterization.
5		5-9	T-10-1A Transformer	Located in Turbine Building at elevation 232 ft, near the air dryers. It has 367-gallon capacity of non-PCB oil.	Within secondary containment berm, no staining observed.		Surrounded by concrete containment dike. No staining observed.				No evidence of a release	Yes, visual inspection. If staining is observed, concrete chip samples may be collected for characterization.
5		5-9	Generator Neutral Grounding Transformer, near isophase bus area	Located in Turbine Building, near isophase bus area. It has 44-gallon capacity of non-PCB oil.	Within secondary containment berm, no staining observed.		Normally not energized. Low risk of fire. Access to this transformer is poor and as of 1997 it still contained PCB oil; however, OP-2016 Rev. 33 lists it as containing "non PCB oil".				No evidence of a release however; prior to removal and disposal, oil should be tested to determine if it's a PCB oil or non-PCB oil transformer.	Yes, visual inspection. If staining is observed, concrete chip samples may be collected for characterization. Transformer oil will require testing.

TABLE 4.0-2
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5		6-1 and 6-2	Radiological Waste Building and Tanks	Radiological Waste Building and Tanks	Not Discussed		Not Discussed					Yes, to determine current conditions and if any releases have occurred.
5		N/A	New Warehouse	New Warehouse	Not Discussed		(7) flammable materials cabinets and (2) acid cabinets. Ventilation for each cabinet hard-piped to outside of building. No visible leaking or damaged containers.			Acid cabinet removed in 2017.		Yes. Evaluation to determine if COCs have been released to environmental media. If a pathway exists, soils immediately adjacent to or below shall be characterized. Sub-floor characterization will be coordinated with the building demolition.
5		N/A	Instrumentation & Control Chemicals Cabinet	Administration Building 3rd Floor	Area properly labeled and in good condition; No leaks or damaged containers observed		(1) flammable materials storage cabinet, No visible leaking or damaged containers.				Cabinet is located on 3rd floor of building. Any releases from chemicals in storage would not impact site soil or groundwater	No
Radiological Waste Building												
6		6-1 and 16	Parts Washer in Rad Waste Building	Operated from approx. 1982 to 1985 and used to clean tools.	Not Discussed		Unit reportedly used Freon, but may have used other synthetic organic solvents.				Area will be visually inspected. If staining is observed, concrete chip samples will be collected.	Yes
Fuel Oil Storage Tanks												
7		7-1	3,000-gallon No. 2 Fuel Oil UST	Located west of the PSB	Installed in 1998, used to store heating fuel for PSB. Passed June 2001 leak test.		Tank is double-walled and has a Veeder-Root automatic monitoring system. Weekly leak tests performed. Annual inspections performed by Veeder Root vendor. Not regulated by VTANR.		Reported as active in the 2017 Phase I by Normandeau.			Yes, explorations will be conducted to confirm no releases have occurred.
7		7-2	75,000-gallon Main Fuel Oil AST	AST has secondary containment	No staining observed.		Tank was drained, cleaned and lined in 2013. Secondary containment dry with no staining observed. Rainwater accumulated in the secondary containment is sampled and analyzed for radiological constituents and oil prior to draining to the river.		Reported as active in the 2017 Phase I by Normandeau.			Yes, to determine if any releases have occurred.
7		7-3	9,600-gallon Diesel AST	South of New Warehouse, used for Station Black-Out Generator	Not in place at time of Phase I/II		Generator and double-walled steel AST at base of generator installed in 2012. Tank appears to be well maintained and in a good condition with no visible evidence of a release.		Reported as active in the 2017 Phase I by Normandeau.			Yes, to determine if any releases have occurred.
7		7-4	1,000-gallon Gasoline AST	Southeast of Gate No. 1	Not in place at time of Phase I/II		Tank appears to be well maintained and in good condition, with no visible indication of leaks or spills		Reported as active in the 2017 Phase I by Normandeau.			Yes, to determine if any releases have occurred.

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7		7-5	500-gallon Waste Oil AST	Located in the Containment Access Building (CAB)	All ASTs have secondary containment including double-walled construction. No evidence of a release observed.		Prior to 2006, waste oil was burned for space heating. It was discontinued when the old CAB was demolished and replaced with the new CAB.	Tank was removed in 2006 when the old CAB was demolished			Tank was in secondary containment and inside the building. Area will be visually inspected. If staining is observed, concrete chip samples may be collected for characterization.	Yes, to determine if any releases have occurred.
7		7-6	275-gallon fuel oil AST	Located in Shipping & Receiving Building	Building was not constructed in June 2001		Tank used for space heating. Has secondary containment and no visible staining observed.		Active according to the 2017 Phase I by Normandeau			Yes, to determine if any releases have occurred.
Transformers (Outside Various Buildings)												
8		8-1	Vernon Hydro Tie Transformer	Transformer is located with concrete containment northwest of the west cooling tower. It has 788-gallon capacity of non-PCB oil.	No staining observed.	Yes, Phase II sampling performed	No staining observed.			As part of the 2001 Phase II, a composite soil sample was collected adjacent to the transformer and analyzed for PCBs.	PCBs were not detected above MDLs in the soil sample.	Yes, to determine if any releases have occurred.
8		8-2	Construction Office Building Transformer	On a concrete pad, north of COB with 210-gallon capacity of non-PCB oil	No staining observed.		Concrete pad has a 2.5-inch high berm formed of masonry bricks around the perimeter of the pad.				No reported spills or leaks.	Yes, to determine if any releases have occurred.
8		8-3	Administration Building Transformer	East of Administration Building. Transformer has 375-gallon capacity of non-PCB oil	Not Discussed		Situated on a concrete pad in containment basin filled with crushed stone. No staining observed.				No evidence of a release	Yes, to determine if any releases have occurred.
8		8-4	Plant Support Building (PSB) Transformer	On a concrete pad west of PSB with a capacity of 248-gallon capacity non-PCB oil.	No soil staining observed.		No staining observed.				No evidence of a release	Yes, to determine if any releases have occurred.
8	14	8-5	Cooling Towers East Transformer	Located in concrete containment north of east towers with a capacity of 545-gallons of non-PCB oil	No soil staining observed.	Yes, Phase II sampling performed	A sample of transformer oil detected PCBs at 249 ppm in January 2005. The transformer is considered "PCB contaminated". Source of the contamination is unknown but may be residual remaining after change out of oil previously containing PCBs. No staining observed.			As part of the 2001 Phase II, a composite soil sample was collected adjacent to the transformer and analyzed for PCBs.	PCBs were not detected above MDLs in the soil sample.	Yes, to determine if any releases have occurred.
8	14	8-6	Cooling Towers West Transformer	In concrete containment north of west towers. Transformer has capacity of 545-gallons of non-PCB oil	No soil staining observed.	Yes, Phase II sampling performed	A sample of transformer oil detected PCBs at 246 ppm in January 2005. The transformer is considered "PCB contaminated". Source of the contamination is unknown but may be residual remaining after change out of oil previously containing PCBs. No staining observed.			As part of the 2001 Phase II, a composite soil sample was collected adjacent to the transformer and analyzed for PCBs.	PCBs were not detected above MDLs in the soil sample.	Yes, to determine if any releases have occurred.
8	2	8-7	Main Transformer	West side of Turbine Building with 27,400-gallon capacity of non-PCB oil	Within a concrete containment vault that drains to oil/water separator MH-A; PCBs in oil in MH-A; PCBs in storm water to 41 ppm; soil staining in vicinity of the transformer. Active leak indicated by presence of sorbent pads.		In 1996, a minor spill was reported at the Main transformer. On 18 June 2004, there was fire at the Main transformer. Transformer oil and fire fighting foam were spread outside the containment. Minor seepage noted. Containments for Main, Auxiliary and Startup Transformers T-3A and T-3B are all connected and drain to MH-A. The source of PCBs detected in MH-A may have been associated with an explosion and fire in the Auxiliary Transformer in 1973.			As part of the 2001 Phase II, a composite soil sample was collected adjacent to the Main Transformer and analyzed for PCBs.	PCBs were not detected above MDLs in the soil sample.	Yes, to determine if additional releases have occurred and to analyze for additional parameters

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8	5	8-8	Auxiliary Transformer	Located on the west side of the Turbine Building. It has a 4,920-gallon capacity of non-PCB oil.	Transformer is within a concrete containment vault connected to the North Storm Drain system through MH-A. No soil staining was observed.		No staining was observed. During an employee interview it was noted that there was an explosion and fire in the Auxiliary Transformer in 1973. Oil was released to the ground beyond the containment area. No record of the incident could be found. Based on the transformer age, it may have contained PCB-oil.					Yes, to determine if any releases have occurred.
8		8-9 and 8-10	Start-up Transformers T-3A and T-3B	Located on the west side of the Turbine Building. Each have a 3,720-gallon capacity of non-PCB oil.	Transformers are within concrete containment vaults connected to the North Storm Drain system through MH-A. No staining observed.		No staining observed.					Yes, to determine if any releases have occurred.
Intake and Discharge Systems												
9		9-1 and 9-2	Intake and Discharge Structure Hydraulic Gate Operating Systems (2)	Hydraulic gate systems at the intake and discharge structures each contain 210-gallons of non-PCB oil	Not Discussed		Systems contain hydraulic oil in sump tanks contained within moated fiberglass building. Systems were not observed.					Yes, to determine if any releases have occurred.
9		9-3	350-gallon Diesel Fire Pump AST	Located in the intake structure	All ASTs have secondary containment including double-walled construction. No evidence of a release observed.		Tank appears to be well maintained and in good condition with no visible evidence of a release.		Reported as active in the 2017 Phase I by Normandeau.			Yes, to determine if any releases have occurred.
9	6	N/A	1,230-gallon Sulfuric Acid AST	Located in the chemical storage building adjacent to the intake structure	This AST has secondary containment. No evidence of a release observed.		Tank and secondary containment appear to be well maintained and in good condition. During an interview, an employee recalled that the acid tank was overfilled once during the 1970s and acid entered the river. A leak from the tank was reported in 1997.		Empty, no longer in use according to 2017 Phase I by Normandeau		Based on the age of the release and its location in close proximately to the river, it is unlikely impacts to site soils or groundwater remain. As part of the investigations for other potential contamination source at the intake structure, samples will be analyzed for pH.	No
9	7	N/A	5,000-gallon Sodium Hypochlorite AST	Located in the chemical storage building adjacent to the intake structure	This AST has secondary containment. No evidence of a release observed.		Tank and secondary containment appear to be well maintained and in good condition, with no indication of spills or leaks. In 1996, minor leakage from system components that entered the storm drain and river was reported.		Empty, no longer in use according to 2017 Phase I by Normandeau		Based on the age of the release and its location in close proximately to the river, it is unlikely impacts to site soils or groundwater remain.	No
9		N/A	275-gallon Polyethylene Tote of Bulab (water treatment chemical)	Located outside the chemical storage building, within secondary containment spill berm.	Not Discussed		Container appeared to be in good condition. Reportedly there was an incidental spill of Bulab outside the chemical storage building. No staining observed.				No reported spills or leaks.	No
9		N/A	330-gallon Polyethylene Tote of Superchlor (water treatment chemical)	Water treatment chemical located outside the chemical storage building on asphalt adjacent to the intake structure	Not Discussed		Container appeared to be in good condition with no visible indication of leaks or spills.				No reported spills or leaks. The tank was removed in early 2015.	No

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9		N/A	2,900-gallon Sodium Bromide AST	Located in the chemical storage building adjacent to the intake structure	Tank has secondary containment. No visible evidence of a release observed.		Tank and secondary containment appear to be in good condition, with no indication of spills or leaks.		Tank was pumped empty in July 2016 by ENRPO and productd was properly disposed of. It is no longer in use according to 2017 Phase I by Normandeau		No reported spills or leaks.	No
Parking Lots												
10		10-1 through 10-3	Site Parking Lots	Main parking lot, Plant Support parking lot and overflow parking lot	Not Discussed		Not discussed.				Not previously investigated.	Yes, releases from leaking equipment/vehicles may have occurred in parking areas impacting underlying soils
Hazardous Materials Storage												
11		11-1	Hazardous Materials Storage Building	Located northeast of South Warehouse	Area properly labeled and in good condition; No leaks or damaged containers observed		Building has steel walls and floor. Six-inch high steel grate supports plywood floor above steel subfloor. Six-inch gap in plywood around perimeter of floor allows drainage of potential spills and containment within underlying steel subfloor.				Currently only used to store 55-gallon drums of new oil for use in plant equipment.	Yes, need to determine current conditions.
11		11-2	Hazardous Waste Storage Building - Former Location	Located west of Main Septic System leach fields, adjacent to the Grounds Maintenance Building	PP-7503 provides details of VYNPS Hazardous Waste Program		Small containers of spent solvents, oily rags, etc. in storage. Area properly labeled and in good condition; No leaking or damaged containers observed. Regulated under EPA ID VTD 045011533. Entergy Nuclear Management Manual ENN-EV-106 Rev 0 describes the Waste Management Program.				Building relocated in 2015.	Yes, need to determine current conditions.
11		11-3	Hazardous Waste Storage Structure - Current Location	Located at the Shipping and Receiving Warehouse	Not Discussed		Main storage facility for small containers of hazardous wastes including spent solvents, oily rags, and other corrosive, reactive, toxic, or special listed wastes.				Building was relocated from its former location and is adjacent to the shipping and receiving warehouse, and is currently used as a short term storage area for universal and hazardous waste.	Yes, need to determine current conditions.

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Former Edson's Gulf Station and Garage												
12		12-1 through 12-5	Former Edson's Gulf Station	306 Governor Hunt Road (currently VYNPS facilities garage)	Not owned by Entergy at the time of the June 2001 Phase I/II.		Purchased by Entergy in 2007, the property is currently used by VYNPS Maintenance for equipment storage. During May 1, 2014 inspection the following items were observed in the backroom: (1) ~100-gallon poly used oil tank; (2) 55-gallon steel lube oil drums on secondary containment skid; (2) steel nonflammable chemical cabinets; (2) steel flammable material cabinets; (1) 275-gallon steel fuel oil AST; (1) sea-van storage container in the south yard containing equipment; (3) 55-gallon steel drums of virgin lube oil- two on a wooden pallet, one on bare ground on east side of building; ~(6) 55-gallon poly drums containing water; (1) ~ 200-gallon steel portable diesel tank. All containers in good condition; no visible evidence of releases.	Phase I ESA completed Oct 11, 2007 prior to Entergy purchase. State listed site (SMS #1993-1485) due to a release of gasoline from 2 USTs and impacts to groundwater and water supply wells. USTs removed in 1990. Monitoring wells installed during site investigation in 1993. Soil vapor extraction system operated from Dec 1994 to Aug 1999. Two VOCs exceeded VT PGQS in one MW in 2006. Other areas of concern include a petroleum-stained floor drain in north bay of garage that drained to a drywell and an in-ground Hydraulic lift. The floor drain and lift pit have been sealed with concrete. Phase II investigation of these areas completed Nov 30, 2007. Letter from VTDEC dated Jan 20, 2009 designated SMS Site No. 93-1485 as "Site Management Activities Completed" and no additional work regarding the gasoline leak required.		In 2007, ECS performed a Phase I ESA on this parcel. They identified the floor drain, dry well, in-ground hydraulic lift, and existing water supply wells as RECs requiring additional investigation. In 2015, some sampling and investigations were completed at this site. Soil samples collected from the floor drain contained concentrations of TPH (DRO), arsenic, chromium and lead above the Industrial Soil Standards (VT IROCP April 2012).	Impacted soils remain in place on-site. Although the dry well area has been excavated, soil samples in the area were not collected. This is a data gap.	Yes. Not all RECs have been investigated. Floor drain soil samples contained TPH (DRO) and metals (lead, arsenic and chromium) at concentrations exceeding Industrial Soil Standards.
Septic Systems and Application Areas												
13		13-1	Main Septic System	The Main Septic System located north of the protected area has 3 leachfileds, one is split into two to accommodate a duct bank that runs through the area.	Groundwater in monitoring wells (MWs) monitored semiannually	Yes, Phase II sampling performed	Groundwater in MWs in leach field and effluent sampled semiannually. The sample results are in compliance with Vermont Agency of Natural Resources (VANR) Groundwater Protection Rules and VANR Solid Waste Management Rules. Regulated by VTDEC Indirect Discharge Permit (IDP) IDP 9-0036. When the septic tanks are pumped the sludge is sampled, analyzed and spread in the South Field Application Area (see COB Septic System).		System active according to the 2017 Phase I by Normandeau	Soil and groundwater samples were collected from the leach field as part of the 2001 Phase II. Samples were analyzed for VOCs, TPH, total 13 PP metals and radiological parameters. Groundwater samples are collected from MWs in the leach field and effluent is sampled semiannually.	TPH was detected at 73 mg/kg in one of the four soil samples analyzed. No concentrations of VOCs or TPH were detected above MDLs in any of the other soil samples. Metal concentrations were within background ranges. TPH was detected (0.55 mg/L) in one (1101) of nine GW samples collected. No VOCs were detected in GW above MDL. Dissolved zinc was the only metal detected above MDLs. Concentrations ranged from 0.0355 mg/l to 0.144 mg/l. Results of the semiannual effluent sampling are in compliance with VANR Groundwater Protection Rules.	Yes, releases may have occurred to this area since last tested in 2001

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13		13-2	New Warehouse Septic System	South of the Protected Area, this system consists of 2 alternating pressurized leach fields and one tank.	Groundwater in MWs monitored semiannually	Yes, Phase II sampling performed	Groundwater in MWs in leach field and effluent sampled semiannually. The sample results are in compliance with VANR Groundwater Protection Rules and VANR Solid Waste Management Rules. Regulated by VTDEC Indirect Discharge Permit IDP 9-0036. When the septic tanks are pumped the sludge is sampled, analyzed and spread in the South Field Application Area (see COB Septic System).		Septic tank and effluent lift stations were pumped in April 2016, after the system was retired from service. Residual may remain in tanks. System inactive according to the 2017 Phase I by Normandeau.	Soil and groundwater samples were collected from the leach field as part of the 2001 Phase II. Samples were analyzed for VOCs, TPH, 13 PP metals and radiological parameters. Groundwater samples are collected from MWs in the leach field and effluent is sampled semiannually.	VOCs or TPH were not detected above MDLs in soil. Metal concentrations were within background ranges. TPH was detected in GW at 0.84 mg/l (well 3301). No VOCs or dissolved metals were detected above MDLs in the GW. Results of the semiannual effluent sampling are in compliance with VANR Groundwater Protection Rules.	Yes, releases may have occurred to this area since last tested in 2001
13		13-3	Construction Office Building (COB) Septic System and Overflow	COB Septic System consists of 1 pressurized mound leach field and 1 tank west of Gate 3, adjacent to the spray pond. The "COB Overflow" system was not constructed until 2003. It consists of 1 leach field and 1 tank north of the PSB.	Groundwater in MWs monitored semiannually; Total petroleum hydrocarbons (TPH) slightly greater than VT Primary Groundwater Quality Standard (PGQS)	Yes, Phase II sampling performed	Groundwater in MWs in leach field and effluent sampled semiannually. The sample results are in compliance with VANR Groundwater Protection Rules and VANR Solid Waste Management Rules. Regulated by VTDEC Indirect Discharge Permit IDP 9-0036. Slightly elevated chloride levels likely due to nearby Application of road de-icing salt. Sludge from the COB, New Warehouse and Main septic systems is accumulated in the 12,000-gallon COB holding tank before spreading in the South Field Application Area in accordance with VY RP 4615, VTDEC Residuals Management Permit No. F9906, and NRC 10 CFR 20.2002 Septage Spreading Permit.		System was retired from service. Residual may remain in tanks. System inactive according to the 2017 Phase I by Normandeau	Soil and groundwater samples were collected from the leach field as part of the 2001 Phase II. Samples were analyzed for VOCs, TPH, total 13 PP metals and radiological parameters. Groundwater is monitored semiannually.	VOCs or TPH were not detected above MDLs in soil. Metal concentrations were within background ranges. For GW, MTBE and TPH were detected at 1.1 ug/L and 2.0 mg/L, respectively. No concentrations of dissolved metals were detected above MDLs. Results of the semiannual effluent sampling are in compliance with VANR Groundwater Protection Rules.	Yes, releases may have occurred to this area since last tested in 2001
13		13-4	South Field Application Area	Approx. 2 acres in size, septage sludge and cooling tower silt are applied to this area.		Yes, Phase II sampling performed	Septage and soil are analyzed prior to each land application. Groundwater is sampled for radiological constituents quarterly and for non-radiological constituents semi-annually and prior to land applications.			Eight soil samples and seven GW samples were collected and analyzed for VOCs, TPH, 13 PP metals and radiological parameters during the 2001 Phase II investigation. TPH was detected in four samples at concentrations ranging from 39 mg/kg to 230 mg/kg. VOCs were not detected in any of the soil samples at concentrations above the MDLs. Metals were within background concentration ranges. In GW, no VOCs or TPH were detected above MDLs. Soluble zinc was the only metal detected above MDLs. Concentrations ranged from 0.184 mg/L to 0.301 mg/L.	TPH impacts to soil are present. According to the 2014 HSA, the septage sample results comply with IDP permit (ID-9-0036) requirements.	Yes, TPH impacts noted in the 2001 Phase II. Other releases may have occurred to this area since last tested in 2001.
13	12	13-5	North Field Application Area	Approx. 8 acres in size, this area was intended for spreading septage, but not used for that purpose. During the Phase I/II ESA, a rusted 55-gallon drum half buried in fill was observed. Debris consisting of plastic sheeting, rebar, wooden planks, glass, concrete etc. was encountered. Drum was reportedly removed on 2 June 2001.		Yes, Phase II explorations performed	Southern 3/4 of area occupied by new VELCO substation. Area not used for spreading septage. Groundwater not currently sampled from area monitoring wells.		A portion of the North Field Application Area was used for development of the VELCO substation area, leaving approximately 2.9 acres. Although this area was reportedly not used for septage application, soil piles were observed northeast of this area during the 2017 Phase I.	Six soil samples, a sediment sample, a surface water sample and nine GW samples were collected as part of the 2001 Phase I and II ESA. Samples were analyzed for one or more of the following: VOCs, TPH, PAHs, PCBs, 13 PP metals and radiological parameters.	TPH was detected in four of the soil samples at a range of 43 mg/kg to 410 mg/kg. No VOCs were detected and metals were within background ranges for soil. The sediment and surface water samples collected from a drainage ditch near the Sonotube silt storage area did not contain VOCs, TPH, PCBs or PAHs. Metals were within background concentrations. In GW, TPH was detected at 3.0 mg/L in the sample collected from MW 101. No VOCs or dissolved metals were detected above MDLs.	Yes, TPH impacts noted in the 2001 Phase II. Other releases may have occurred to this area since last tested in 2001. Soil piles will require sampling for beneficial reuse on site and/or off-site disposal

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AOC No.	VANR AOC No.	PCS No.	AREAS OF CONCERN (AOCs)[1]	AOC LOCATION/DESCRIPTION	2001 PHASE I & II ESA STATUS[2]	2001 PHASE I & II RECOGNIZED ENVIRONMENTAL CONDITION[2]	2014 HSA AOC STATUS[3]	OTHER INVESTIGATIONS	2017 PHASE I ESA[4]	SUMMARY OF INVESTIGATIONS	FINDINGS/STATUS	ADDITIONAL INVESTIGATION REQUIRED
13		N/A	Gatehouse Septic	Consists of 1 leach field and 1 septic tank east of Gatehouse No. 1	Groundwater in MWs monitored semiannually		Groundwater in MWs in leach field sampled semiannually. The sample results are in compliance with VANR Groundwater Protection Rules. Regulated by VTDEC Indirect Discharge Permit IDP 9-0036.		System inactive according to the 2017 Phase I by Normandeau. Tank was pumped for the final time on 27 July 2015, after the system was retired.	Groundwater is monitored semiannually.	Results are in compliance with VANR Groundwater Protection Rules.	No. Based on use and lack of potential chemical release to system, no further investigation warranted.
13		N/A	Plant Support Building (PSB) Septic System	Consists of two alternating pressurized leach fields and one 3,000-gallon tank, south of the PSB.	Groundwater in MWs monitored semiannually		Groundwater in MWs in leach field and effluent sampled semiannually. The sample results are in compliance with VANR Groundwater Protection Rules and VANR Solid Waste Management Rules. Regulated by VTDEC Indirect Discharge Permit IDP 9-0036. Slightly elevated chloride levels likely due to nearby application of road de-icing salt.		System active according to the 2017 Phase I by Normandeau			No. Based on use and lack of potential chemical release to system, no further investigation warranted.
13		N/A	Governor Hunt House Septic	Consists of 1 leach field and 1 septic tank east of the building	Groundwater in MWs monitored semiannually		Groundwater in MWs in leach field sampled semiannually. The sample results are in compliance with VANR Groundwater Protection Rules. Regulated by VTDEC Indirect Discharge Permit IDP 9-0036.		System active according to the 2017 Phase I by Normandeau	Groundwater is monitored semiannually.	Results are in compliance with VANR Groundwater Protection Rules.	No. Based on use and lack of potential chemical release to system, no further investigation warranted.
Storm Water Outfalls												
14	8	14-1	North System Outfall (S/N 006)	Outfall is east of plant stack.	Drains portions inside and outside the Protected Area. Dissolved PCBs detected in MH-A oil/water separator of this system. Source is drainage from the Main Transformer containment vault.	Yes, Phase II sampling performed	No staining observed. Waste water from the Turbine Building was released to the North Storm Drain in 1983.			Two wastewater samples were collected from the North Outfall area as part of the 2001 Phase II. Samples were analyzed for one or more of the following: VOCs, TPH, PAHs, PCB, 13 PP metals, and radiological parameters.	TPH was detected at 1.2 mg/L in one of the two samples collected. VOCs, PAHs, and PCBs were not detected above MDLs. Total zinc was the only metal detected (0.0755 mg/L).	Yes, need to determine current conditions.
14	9	14-2	South System Outfall (S/N 007)	Outfall is inside the Cooling Water Discharge.	Drains portions inside and outside the Protected Area. Oil/water separator (MH-C) had no oil on 8 May 2001. Oil/water separator (MH-B) connected to sump in containment for 75,000-gallon Main Fuel Oil AST	Yes, Phase II sampling performed	No staining observed. During an interview an employee recalled that a valve on the turbine lube oil pipeline was misaligned during an outage in the late 1970s. Oil was pumped through the oil tank vent to the roof of the Turbine Building. It flowed to a downspout, through the storm water drain and to the river at the discharge structure. In 1976, the condensate storage tank overflowed approximately 83,000 gallons that drained to the river (Reportable Occurrence No. RO-76-22/1T).			Two wastewater samples were collected from the South Outfall area as part of the 2001 Phase II. Samples were analyzed for one or more of the following: VOCs, TPH, PAHs, PCB, 13 PP metals, and radiological parameters.	TPH was detected at 11 mg/L in one of the two samples collected. VOCs, PAHs, and PCBs were not detected above MDLs. Low levels of total copper (0.0057 mg/L) and total zinc (0.0307mg/L) were detected.	Yes, need to determine current conditions.
14		14-3	Southeast System Outfall (S/N 008)	Outfall south of the East Cooling Tower	System consists of one catch basin draining to outfall south of the East Cooling Tower.		No staining observed.					Yes, need to determine current conditions.

TABLE 4.0-2
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14		14-4	345 kV Switchyard Outfall (S/N 010)	Outfall north of the North Storm Water System Outfall	Perimeter curtain drain drains to outfall		No staining observed.					Yes, need to determine current conditions.
14		14-5	115 kV Switchyard Outfall (S/N 011)	Outfall discharges to the CT River north of the 345 kV Switchyard outfall	Perimeter curtain drain drains to outfalls		No staining observed.					Yes, need to determine current conditions.
14		14-6	Combined VELCO/VY Outfall (S/N 012)	Collects storm water from VELCO substation and VY parking lots and fields and discharges to the CT River north of the 115 kV Switchyard outfall	System drains storm water from VELCO substation and VY parking areas and fields							Yes, need to determine current conditions.
Cooling Tower Area												
15		15-1	Creosote-coated Wooden Pilings beneath Cooling Towers	Pilings beneath Cooling Towers	Not Discussed						Not previously investigated.	Yes, chemicals may have leached impacting soils in contact with piles and groundwater quality
15	11	15-2	Area "B-2"	Located between East and West Cooling Towers	Temporary storage of sediment collected from the cooling towers.	Yes, Phase II sampling performed	Sediment from cooling towers no longer stored here; two flammable liquids cabinets containing small containers of oils.			Soil samples were collected during the 2001 Phase II investigation. Samples were analyzed for VOCs, TPH, total 13 PP metals and radiological parameters.	Waste oil reportedly spread on the ground in this area during early plant operations3. TPH in both soil samples collected from this area at 67 mg/kg and 100 mg/kg during the Phase II investigation. VOCs were not detected and metal concentrations were within background ranges.	Yes, TPH impacted soil present.
15	10	15-3	Laydown Area southeast of Cooling Towers	Area southeast of Cooling Towers	Not Discussed		Several soil and asphalt piles were observed as well as discarded fuel shipping boxes. According to a former employee, it was reported that cable unused during plant construction was buried in this area.		Soil and debris piles were observed during Normandeau's site visit as part of the 2017 Phase I.			Yes, area will be investigated for potential releases impacting soil and groundwater. Soil and debris piles will be sampled for potential beneficial reuse on-site or off-site disposal.
15		N/A	190-gallon B5B Portable Diesel Fire Pump Tank	Portable diesel fire pump fuel tank south of the 345 kV Switchyard.	Not Discussed		Emergency pump to augment plant fire protection system pumps. Tank appears to be in good condition. No visible indication of leaks or spills.		Active and located between the cooling towers according to the 2017 Normandeau Phase I. Stored in a newly constructed shed.		Portable fire pump with tank. No reported spills or leaks. Storage area will be inspected for visible evidence of a release. If staining is observed, concrete chip samples may be collected for characterization.	No
Site Groundwater												
16		16	Site Groundwater Quality	General Site Groundwater Quality	Not Discussed	Some Impacts to various areas noted during 2001 Phase II	Not discussed in general. AOC specific.				Current site groundwater quality (in regards to non-radiological compounds) is unknown although, quarterly analytical results from the potable water wells are available.	Yes, current groundwater conditions are unknown.

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Water Supply Wells (bedrock)												
N/A		N/A	West/Main Well	West of 345 kV Switchyard and north of the PSB parking lot	Source ID#283, depth 555 ft. tested quarterly for coliform bacteria and other chemical parameters as required by VANR in their required monitoring schedule, issued annually.	Yes, Phase II sampling performed	The only water supply well currently in use, supplying potable water to all buildings except the PSB and Power Upright Building (PUB).		Well is active according to the 2017 Phase I by Normandeau	A drinking water sample was collected from this well as part of the 2001 Phase II. The sample was analyzed for VOCs, TPH, total 13 PP metals and radiological parameters.	No concentrations of TPH or VOCs were detected in the 2001 Phase II sample. Total metals detected included copper (0.108 mg/l), total lead (0.103 mg/l) and total zinc (0.0372 mg/l). Required quarterly total coliform sample results are in compliance with requirements of permit WSID #8332.	No
N/A		N/A	NEOB Well	North of PSB	Source ID#6642, depth 500 ft. Tested quarterly for coliform bacteria.	Yes, Phase II sampling performed	Supplies potable water to PSB and PUB.		Well is active according to the 2017 Phase I by Normandeau. It only provides waster to the PSB as the PUB has been removed.	A drinking water sample was collected from this well as part of the 2001 Phase II. The sample was analyzed for VOCs, TPH, total 13 PP metals and radiological parameters.	No concentrations of TPH or VOCs were detected in the 2001 Phase II sample. The only metal detected was total copper (0.0187 mg/l). Required quarterly total coliform sample results are in compliance with requirements of permit WSID #8332.	No
N/A		N/A	COB Well	North of COB	Source ID#214, depth 362 ft. Activated carbon filtration system to remove chlorinated solvents; tested quarterly for coliform bacteria, chlorinated solvents and other chemical parameters as required by VANR in their required monitoring schedule, issued annually.	Yes, Phase II sampling performed	Permanently abandoned on 4 February 2013.		Abandoned; grouted in place according to the 2017 Phase I by Normandeau	A drinking water sample was collected from this well as part of the 2001 Phase II. The sample was analyzed for VOCs, TPH, total 13 PP metals and radiological parameters.	Concentrations of VOCs 1,1-DCA (1.7 ug/l) and 1,1-DCE (2.3 ug/l) were detected in the sample collected as part of the 2001 Phase II. No TPH was detected. Total metals detected included copper (0.0320 mg/l), total lead (0.0146 mg/l) and zinc (0.0118 mg/l). According to the 2014 HSA, the well has been permanently abandoned.	No. Well has been permanently abandoned.
N/A		N/A	Southwest Well	Southwest of Turbine Building	Source ID#253, depth 500 ft. Tested Quarterly for coliform bacteria		No longer used as a source of potable water however, still used for process water. Permanently disconnected from potable water system.		Non potable use confirmed in Normandeau 2017 Phase I		Used for process water	No. Well not used for potable water. Will require proper abandonment if no longer in use.
Small Satellite Chemical & Flammable Material Storage Areas												
N/A		N/A	Pipe Storage Building	Clean Workshop	Area properly labeled and in good condition; No leaks or damaged containers observed		(2) flammable materials cabinets, paint storage, insulation shop. Area properly labeled and in good condition; No leaking or damaged containers observed.				No evidence of a release. Building was removed in 2015.	No
N/A		N/A	Former Environmental Laboratory Facility (ELF)	North of discharge structure	Area properly labeled and in good condition; No leaks or damaged containers observed		Building has been removed. Formerly contained small quantities of chemicals (acids, etc.) used to prepare samples for shipping and petroleum products (fuels) for use in boats used for sampling in the river.				No evidence of a release	No
N/A		N/A	Grounds Maintenance Building	West of Main Septic System leach fields	Area properly labeled and in good condition; No leaks or damaged containers observed		Storage of lawn mowers, snow plows, string trimmers, etc. No leaking or damaged containers observed.				No evidence of a release. Building was removed in 2015.	No
N/A		N/A	15,000-gallon Nitrogen AST	Located east of the Reactor Building	No evidence of a release observed.		Tank appears to be well maintained and in good condition, with no visible indication of leaks or spills		Empty, no longer in use according to 2017 Phase I by Normandeau		No reported releases. Not likely to impact site soil or groundwater	No
N/A		N/A	150-gallon ethylene glycol AST	Located on the roof of the AOG Building	All ASTs have secondary containment including double-walled construction. No evidence of a release observed.		No tank found on the roof. Ethylene glycol is filled directly into AOG chillers on a large skid on the upper level of the building. Equipment is well maintained and in good condition with no indication of leaks or spills.		Empty, no longer in use according to 2017 Phase I by Normandeau		Tank not found during 2014 HSA. Located on upper level of building. Releases would not impact site soil or groundwater.	No

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N/A		N/A	Cooling Tower Fan Gearboxes	11 per tower (22 total) 12.5-gallon capacity each of non-PCB oil	Not Discussed		Gearboxes do not have oil containment devices. Gearboxes not observed.				Oil was drained from gear boxes in 2015. Only residual oil remains.	No
N/A		N/A	Containment Access Building (CAB)	CAB, east of AOG Building	Area properly labeled and in good condition; No leaks or damaged containers observed		Original CAB was a Quonset hut structure that existed from approximately 1985 to 2006. The current CAB was constructed within the footprint of the old CAB to provide a ceiling sufficiently high to accommodate the transporter for the spent fuel dry storage casks and the shield cask. No chemicals or flammable materials are stored in the CAB currently. Waste oil was formerly burned in the CAB, but that practice has been discontinued.				No evidence of a release	No
Compressed Gas Storage Areas												
N/A		N/A	East of South Warehouse	East of South Warehouse	Area properly labeled and in good condition; No leaks or damaged containers observed		Area properly labeled and in good condition; No leaking or damaged containers observed.				Releases of compressed gases are not likely to impact site soil or groundwater	No
N/A		N/A	North of South Warehouse	North of South Warehouse	Area properly labeled and in good condition; No leaks or damaged containers observed		Area properly labeled and in good condition; No leaking or damaged containers observed.				Releases of compressed gases are not likely to impact site soil or groundwater	No
N/A		N/A	Inside Southwest corner of Turbine Building	Inside Southwest corner of Turbine Building	Area properly labeled and in good condition; No leaks or damaged containers observed		Air compressors and associated compressor oil. No leaking or damaged containers observed.				Releases of compressed gases are not likely to impact site soil or groundwater	No
N/A		N/A	West of Turbine Building	West of Turbine Building	Area properly labeled and in good condition; No leaks or damaged containers observed		Compressed gas no longer stored at this location.				Releases of compressed gases are not likely to impact site soil or groundwater	No
N/A		N/A	Northeast of Switchgear Rooms & North of Control Room	Northeast of Switchgear Rooms & North of Control Room	Area properly labeled and in good condition; No leaks or damaged containers observed		Storage of argon and other instrument gases, as well as carbon dioxide for fire suppression. Area properly labeled and in good condition; No leaking or damaged containers observed.				Releases of compressed gases are not likely to impact site soil or groundwater	No
N/A		N/A	Hydrogen Skid	South of Cooling Towers	Not constructed at time of Phase I/II		Area properly labeled and in good condition; tanks appear to be well maintained, with no evidence of leaks.			Hydrogen was removed from site in 2015. Pad used for equipment storage.	Releases of compressed gases are not likely to impact site soil or groundwater	No
Other Areas Identified												
N/A		N/A	Road Salt & Sand Storage Shed	Salt and sand stored under roof, on a concrete slab. Area located north of 345 kV Switchyard.	Not Discussed		An interview with a former employee revealed this area was formerly used for storage of lawn maintenance equipment.				No visible evidence of a release	No
N/A		N/A	Soil Piles	Soil piles located northeast of VELCO Substation	Not Discussed		Storage of silt vacuumed from west cooling tower wet well, soil removed during construction of ISFSI, etc.				According to the HSA, the soil was removed during ISFSI construction	No
N/A		N/A	Area "B-5"	Located west of the 115 kV switchyard	Radiological activity in soil reported in file 10CFR50.75(g)	Yes, Phase II sampling performed	No evidence of impacted soil; likely removed during construction of the VELCO switchyard.			Soil samples were collected during the 2001 Phase II investigation. Samples were analyzed for VOCs, TPH, total 13 PP metals and radiological parameters.	No VOCs or TPH were detected in soil at concentrations above the MDLs. Metal concentrations were within background ranges.	No

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N/A		N/A	Sonotube Area	Located south of the North Field Application Area	Used for the storage of dredged sediments from area of circulating water intake.		Removed from site during construction of the VELCO Switchyard. Soil was sampled, analyzed and confirmed clean.				No longer present. No evidence of a release.	No
N/A		N/A	Main Plant Ventilation Stack	Interim off-gas system used in 1973. Off-gas was passed through carbon in buried pipes west of the stack. System abandoned in place.	Not Discussed		42,000 pounds of activated carbon remains in buried pipes. Soil at the base of the stack has been amended by the addition of several tons of salt to increase conductivity and improve grounding of the lightning protection system.				Carbon contained in buried pipes. Removal to be addressed as part of the demolition activities.	No
N/A		N/A	Concrete Batch Plant (south of cooling towers)	Used during plant construction. Area was used for construction demobilization and construction material staging.	Not Discussed		No evidence of the batch plant remained in 2014. Construction materials staged in this area was reportedly liquidated within approx. 2 years of plant start-up.				Plant no longer present. No evidence of a release.	No
N/A		N/A	Area of Lead (is/was used)	Lead-based paint widely used during plant construction, and lead blankets and blocks used for shielding in parts of the Protected Area.	Not Discussed		Use of lead-based paint was not controlled prior to 1978. It was widely used during plant construction. Lead blankets and blocks used for shielding in parts of the Protected Area.				Hazardous building materials will be identified, characterized, remediated/removed and properly disposed of prior to demolition in accordance with specific Work Plans.	Will be addressed separately.
N/A		N/A	Areas where asbestos is/was used	Asbestos is present in pipe insulation on-site. Baffles in the cooling towers are comprised of asbestos containing material (ACM).	Not Discussed		A 1999 inventory of asbestos insulation at VYNPS identified 79,410 cubic feet of asbestos.				Hazardous building materials will be identified, characterized, remediated/removed and properly disposed of prior to demolition in accordance with specific Work Plans.	Will be addressed separately.
N/A		N/A	Areas where Mercury is/was used	Mercury is used in switches, gauges, and fluorescent bulbs throughout the plant.	Not Discussed		Various spills have been reported and cleaned up.				Spills were reportedly cleaned up. Spills requiring additional investigation have not been noted.	No
N/A		N/A	Former Wood Burning Area	Located northwest of the 345 kV Switchyard, between the two railroad spurs	Although there was no evidence of current use, ash was observed in the grass.	Yes, Phase II sampling performed	No evidence of impacted soil; likely removed during construction of the VELCO switchyard. Area is no longer identifiable.			Two soil samples and a groundwater sample were collected in this area as part of the 2001 Phase II. Samples were analyzed for VOCs, TPH, PAHs, PCBs and 13 PP metals. Additionally, groundwater was analyzed for radiological parameters.	With the exception of Naphthalene (130 ug/kg) no VOCs, PAHs, TPH or PCBs were detected above MDLs in soil. Metal concentrations were within background ranges. In GW, no VOCs, TPH, PAHs, PCBs or dissolved metals were detected above MDLs.	Yes. Since area is part of active VELCO substation area, this AOC will be address in downgradient explorations performed while investigating other AOCs

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Other Near-by Properties												
N/A		N/A	Former Evelyn Edson Residence	298 Governor Hunt Road	Not owned by Entergy at the time of the June 2001 Phase I/II.		May 1, 2014 inspection: site is occupied by the Town of Vernon and used as their emergency response center. Two 120-gallon propane tanks (fabricated in 2012) on concrete pads at southeast exterior corner of house. (1) 275-gallon fuel oil tank in basement. Suspected asbestos floor tiles in south room in basement. No visible indications of spills or leaks.	Phase I ESA completed November 6, 2009 prior to purchase by Entergy. No Recognized Environmental Conditions (RECs) identified.				No.
N/A		N/A	Former Lagro Property/White House ("Double Wide")	394-396 Governor Hunt Road, VYNPS Environmental Facility	Not owned by Entergy at the time of the June 2001 Phase I/II.		May 1, 2014 inspection: the "Double Wide" is used by the VYNPS Environmental Program and Radiological Environmental Monitoring Program (REMP) for offices and environmental sample processing. One 275-gallon fuel oil AST is in the basement. One pad-mounted transformer is on north side of driveway. No visible indications of spills or leaks.	Phase I ESA completed May 19, 2008 prior to purchase by Entergy. Two residences (394 and 396) formerly existed on the property; only the house at 394 Governor Hunt Road ("Double Wide") remains. Two vehicles burned at the site in approximately 1996-1998. A 275-gallon kerosene UST was removed from the trailer at 396 Governor Hunt Road in October 1999. No UST closure report is available. No other issues indicating a risk to soil or groundwater identified.			No RECs identified	No.
N/A		N/A	Former Zaluzny Residence	422 Governor Hunt Road	Not owned by Entergy at the time of the June 2001 Phase I/II.		May 1, 2014 inspection identified portable light towers and generators stored in the garage by VYNPS Maintenance. One 275-gallon fuel oil AST in basement. No visible indications of spills or leaks.	Phase I ESA completed February 16, 2012 prior to purchase by Entergy; 2,000-gallon fuel oil UST removed from south side of residence January 30, 2012; tank did not leak; no Recognized Environmental Conditions.			No RECs identified	No.
N/A		N/A	Land between Plant Fence & Entergy Fence on east side of Governor Hunt Road	Behind properties on east side of Governor Hunt Road	Not discussed		Leased to local farmer for hay fields				No RECs identified	No.

Notes:
1. Areas of concern (AOCs) compiled from several sources including the 2014 HAS by RCSC, 2001 Phase I and II ESA by ECS, 2017 Phase I by Normandeau Assoc. and H&A
2. Source: "Phase I and II Environmental Site Assessment" prepared on 4 June 2001 by Environmental Compliance Services, Inc.
3. Source: "Non-Radiological Historical Site Assessment" prepared September 2017 by Radiation safety & Control Services
4. Source: "Phase I Environmental Site Assessment Report" prepared 9 August 2017 by Normandeau Associates.
5. Source: "Final North Warehouse Soil Characterization Report, Revision 1" prepared on 8 August 2017 by Haley & Aldrich, Inc.
6. Results of radiological analyses are not discussed in this report or included in this AOC table.
7. MDLs: Analytical Laboratory Method Detection Limits

Glucksberg, Nadia

From: Glucksberg, Nadia
Sent: Monday, March 4, 2019 5:05 PM
To: Noyes, Gerold
Cc: Daniels, Corey; Langub, Nelson; Reid, Billy; van Noordennen, Miles; Danaher, Elida
Subject: SVY-19-009 Site Investigation Overview Presentation
Attachments: SVY-19-009 Investigation Overview-F1.pdf

Gerold

As promised attached is the revised presentation that we gave last week. We have edited the names of the different reports for consistency and included an overview/road map of the work plans on slide No. 7.

Thanks again for your time and we look forward to seeing your team on March 15th.

Nadia

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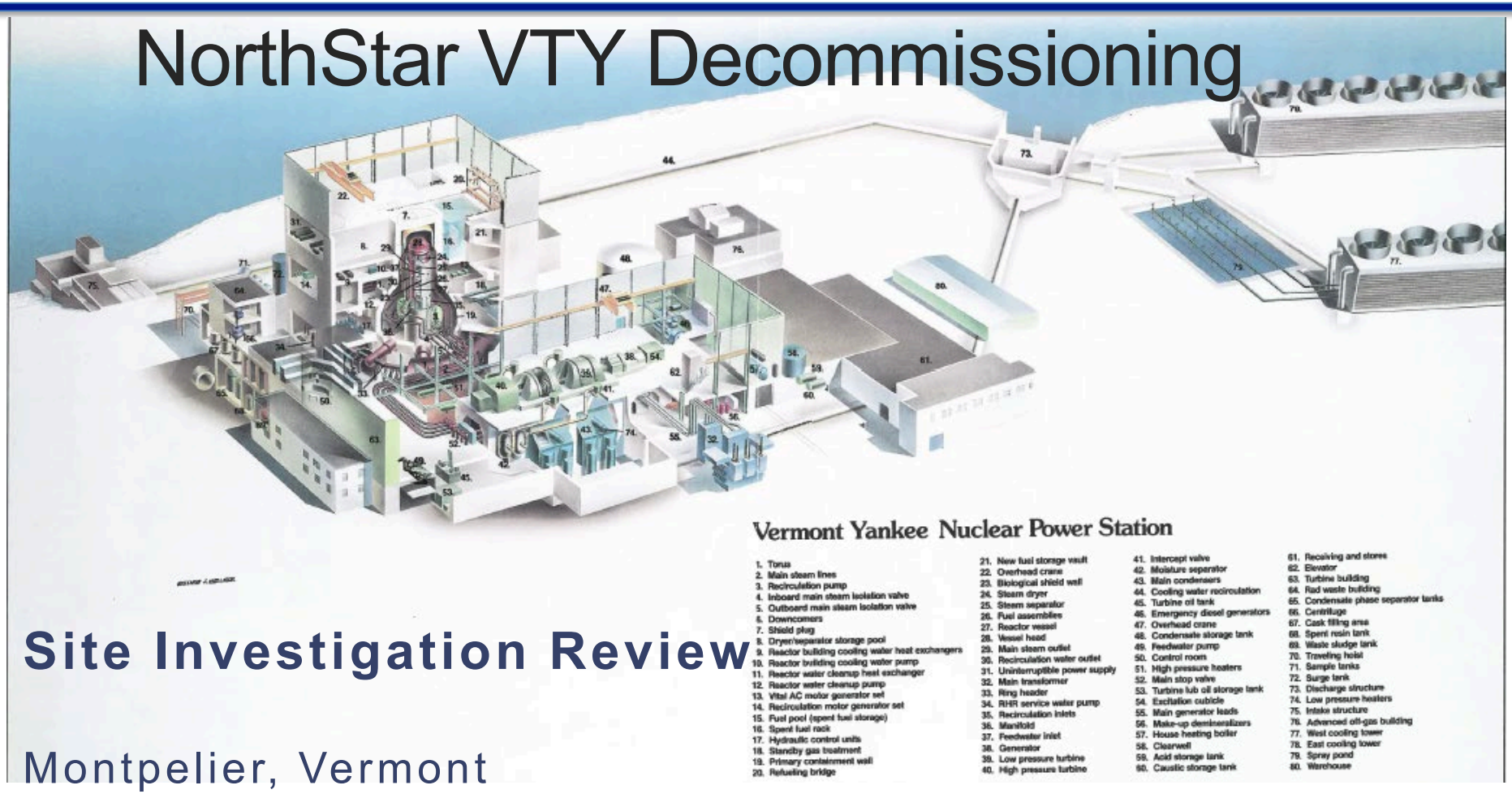
NorthStar Nuclear Decommissioning Company, LLC

NorthStar VTY Decommissioning



Site Investigation Review

Montpelier, Vermont
February 28, 2019
SVY-19-001

Agenda

NorthStar

Introductions

Site Background

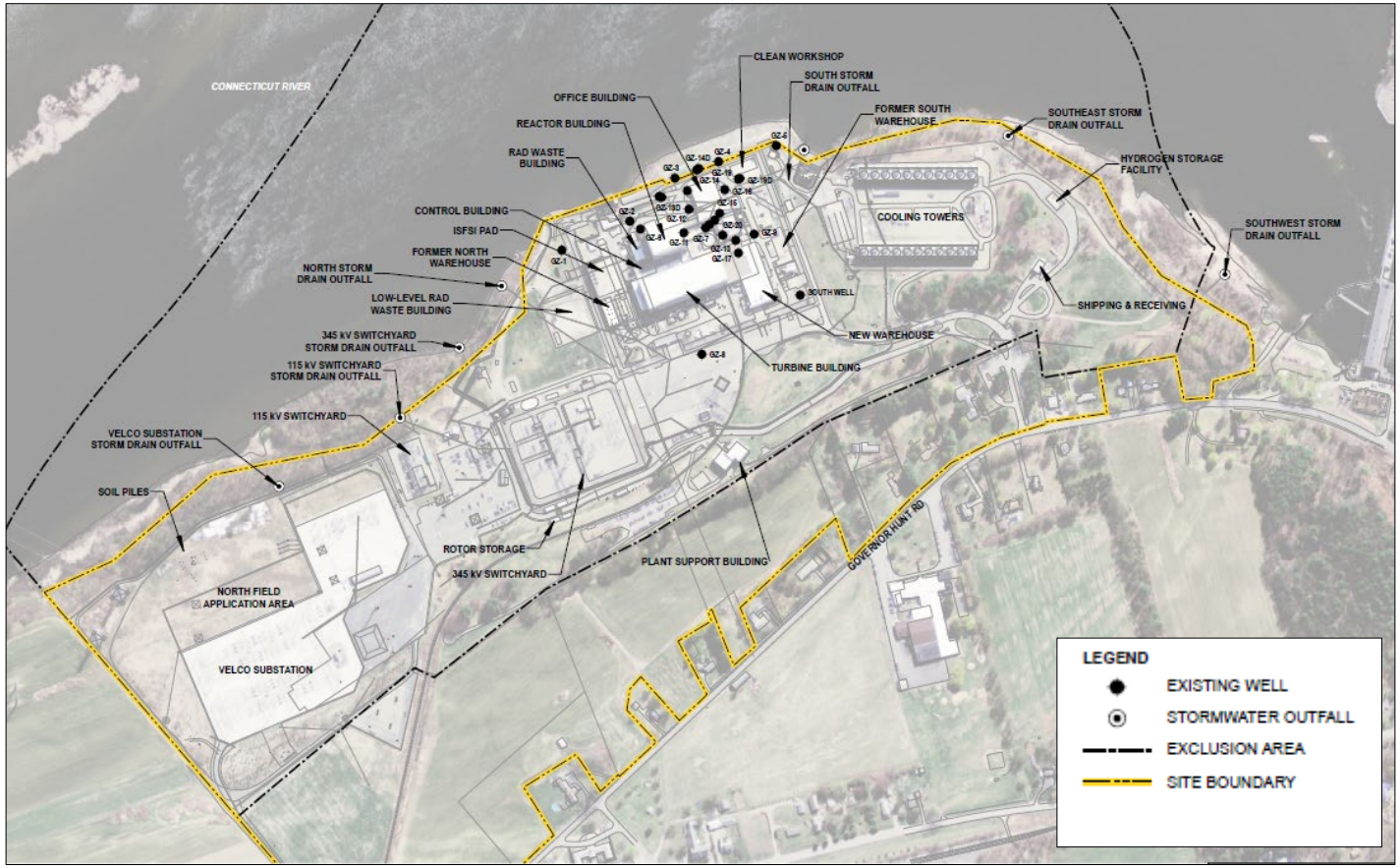
Previous Investigations

Areas of Concern and Proposed Investigations

Coordinated Work Plans

Schedule

Current Site Conditions



NorthStar

Project Goals and Schedule

Target Zero Safety

Streamlined Programs, Work Authorization and Implementation

NNDC Decommissioning Starting 2019 w/ License Transfer

- Optimize RPV/RPVI removal & disposition
- Large Component Removal 2019 - 2020
- Building D&D 2020 – 2026

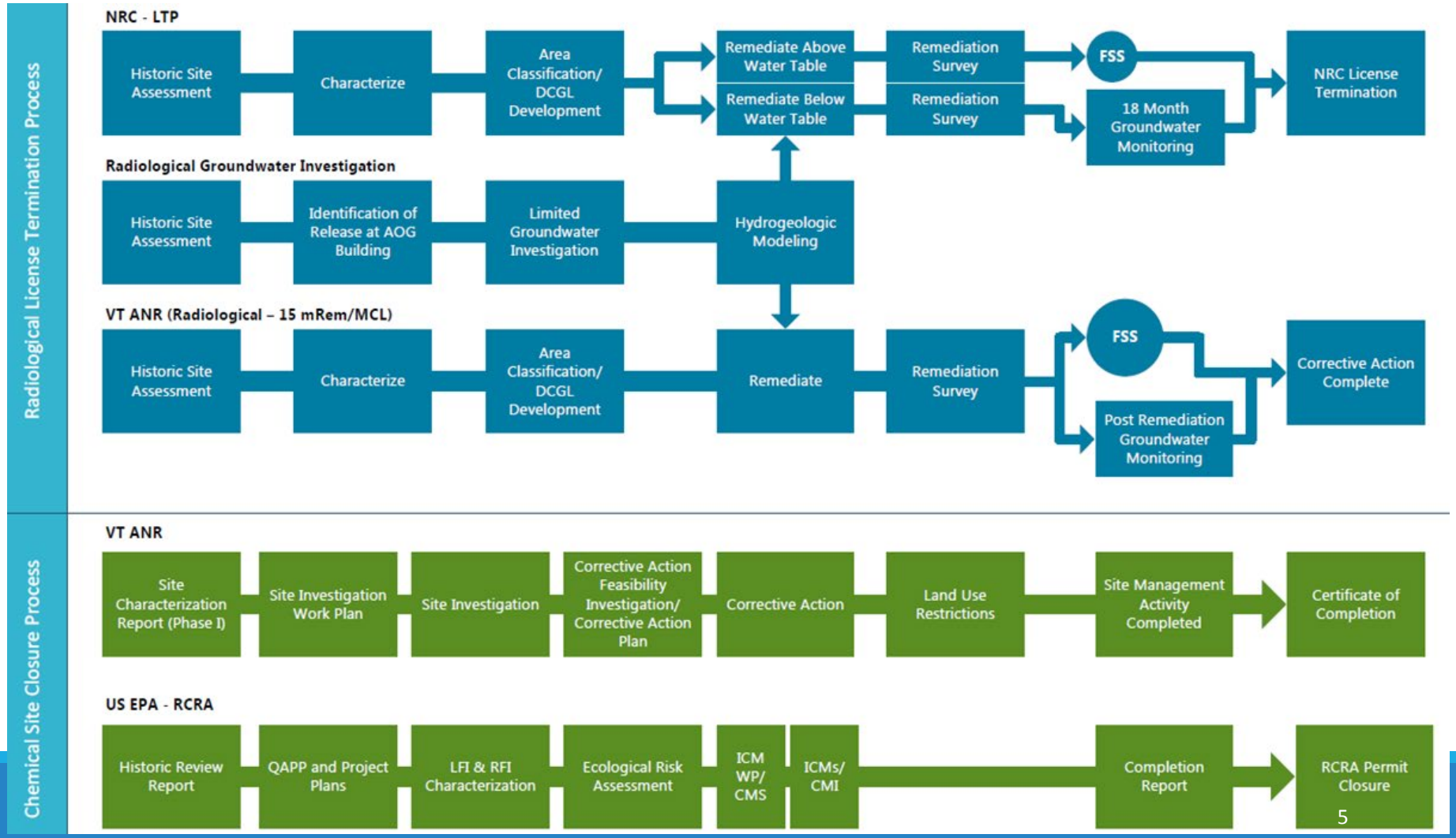
Site Remediation During Decommissioning Phases

- Compliance with I-Rule
- Compliance with the MOU

Partial Site Release by 2026

Project driven w/dedicated decommissioning staff

Programs Overview/Overlap



MOU Milestones

January 11th - Site Transfer

February 12th - ANR kickoff meeting

- Working meeting requested to go over scope of work and proposed site investigations

March 11th - (60 days from transaction) Initial draft work plans due to ANR

- Submitted to ANR on ***February 19, 2019***

~~May 10th~~ April 19th - (60 days from submittal) Receive comments from ANR on work plans

~~June 10th~~ May 19th - (30 days from receiving comments) Submit final work plans

ANR Final approval

- Field activities to start immediately upon approval

July 11th – (6 months from transaction) Site Investigation Report Due

Coordinated Documents

*Limited Non-Radiological Site Sampling Plan, Rev F

- *Appendix A: Below-Grade Structure Survey Work Plan
- *Appendix B: Borrow Materials Import Plan
- *Appendix C: Groundwater Monitoring Plan
- *Appendix D: Concrete Reuse Plan

Quality Assurance Project Plan, Rev E

Limited Building Characterization Completion Report, Rev C

Waste Acceptance Grouping Identification Plan, Rev E

** Denotes MOU required work plans*

Limited Non-Radiological Site Sampling Plan

Work plan developed to be iterative and to evaluate if releases occurred,

- Follow up investigations to be completed as warranted
- Will work with ANR, as data are available, to refine the CSM and continue to move forward in the Site Closure Process
- Remediate localized soils as access allows

Treats groundwater as its own AOC

- With separate Groundwater Monitoring Plan

Coordination with D&D work schedule

Prepared to complete field activities immediately after ANR approval with dedicated staff that knows the site and understands the project goals

Coordinated Approach

Historical Site Characterization Report is the first step to introduce the Site Conceptual Model and includes a summary table (Table 4.0-2) linking previous work and identifying data gaps

- Phase I and II Investigations
- Historical Site Assessments
- ANR comments

Complementing Work Plans appended to the Limited Non-Radiological Site Sampling Plan

- Imported Fill Management Plan
- Building Materials Characterization
- Below Grade Structures Management Plan
- Groundwater Monitoring Plan

Areas of Concern

Challenges

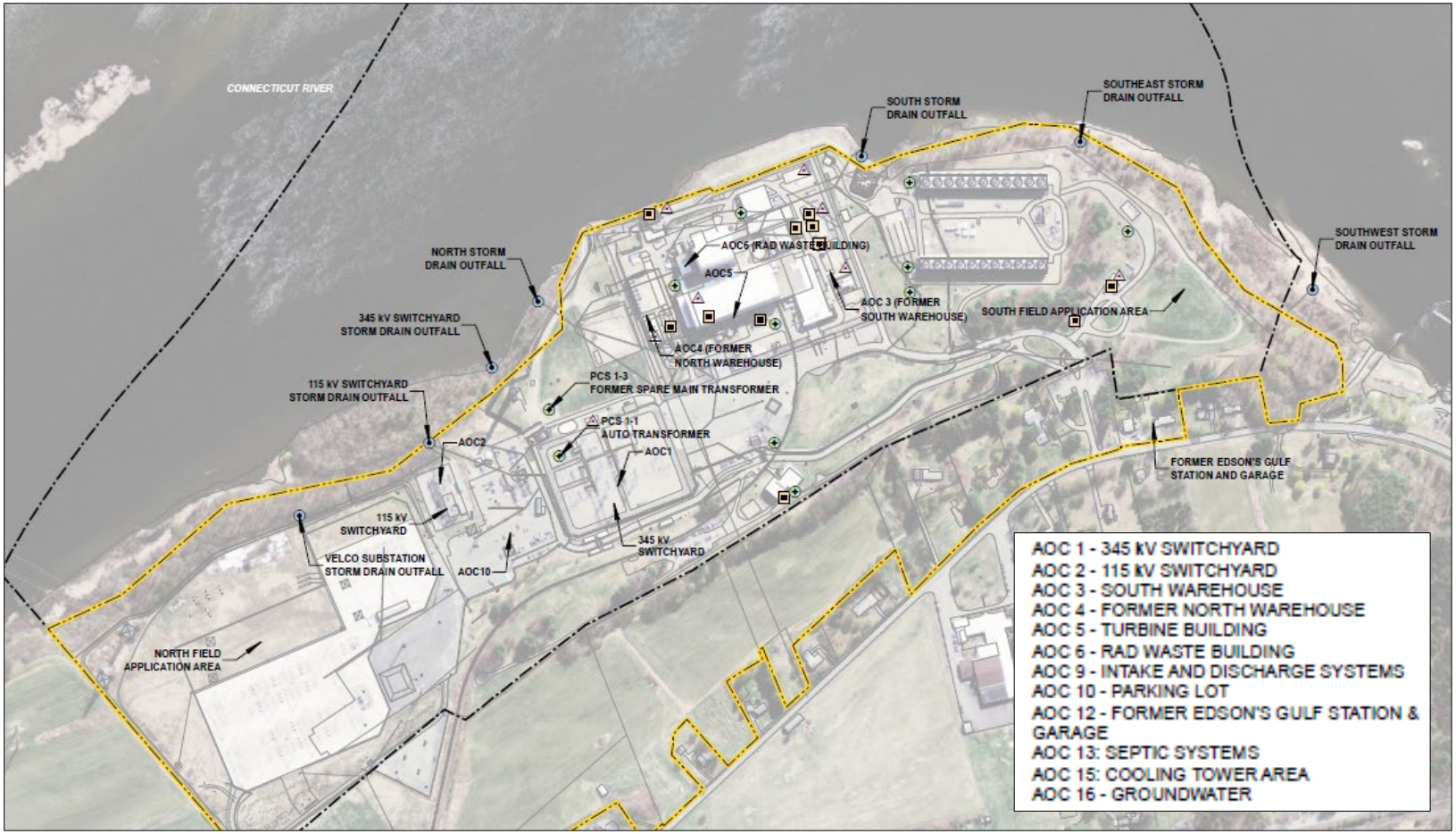
- Each report identified similar issues, but with different names/identification
- Limited access to date to collect samples

Resolution

- Group AOCs geographically or by type of potential source(s)
  - USTs, Transformers
- Incorporate ANR's comments on locations and analyses
- Coordinate work with D&D efforts

Areas of Concern (AOCs)	
AOC 1	345 kV Switchyard
AOC 2	115 kV Switchyard
AOC 3	Former South Warehouse
AOC 4	Former North Warehouse
AOC 5	Turbine Building
AOC 6	Radiological Waste Building
AOC 7	Fuel Storage Tanks
AOC 8	Transformers
AOC 9	Intake and Discharge Systems
AOC 10	Parking Lots
AOC 11	Hazardous Materials Storage
AOC 12	Former Edson's Gulf Station and Garage
AOC 13	Septic Systems
AOC 14	Storm Water Outfalls
AOC 15	Cooling Tower Area
AOC 16	Site Groundwater

16 Areas of Concern



Integrated Documents

MOU required Work Plans (appended to the Limited Non-Radiological Site Sampling Plan)

Waste Acceptance Grouping Identification Plan

- Radiological and chemical waste profile requirements and sample frequency
- Soils handling and documentation

Quality Assurance Project Plan

- Provide procedures
- Laboratory Detection/Reporting Limits
- QA/QC requirements
- Project Structure

Generic Voluntary Corrective Action Plan

- Impacted soils will most likely be remediated via excavation and off site disposal
- Work plan sets expectations for soil management and post excavation sampling
- Each area will first be delineated, documented to determine the drivers for the remedial action
- Designed to streamline the approval process

Investigation Approach

Iterative steps to characterize impacts

- Identify if impacts are present
- Delineate extent of impacts (vertical and horizontal)
- Identify if remediation is warranted
- Soils – Excavate for off site disposal
  - Confirm extent with bottom and sidewall samples
  - Documentation
- Groundwater – evaluated per I-Rule Standards
- Sediments – evaluate per risk assessment

Summary of AOCs and Proposed Investigations

AOC 1 – 345 kV Switchyard

Main Site Switchyard

- Includes the Auto Transformer and the Former Spare Main Transformer
- Previous report of oil leak at the Auto Transformer in 2003 – soils contaminated with TPH above VT Reuse Criteria (No PCBs detected)
- Stained soils noted at the Former Spare Main Transformer location
- COCs include: PCBs, PAHs, metals, herbicides

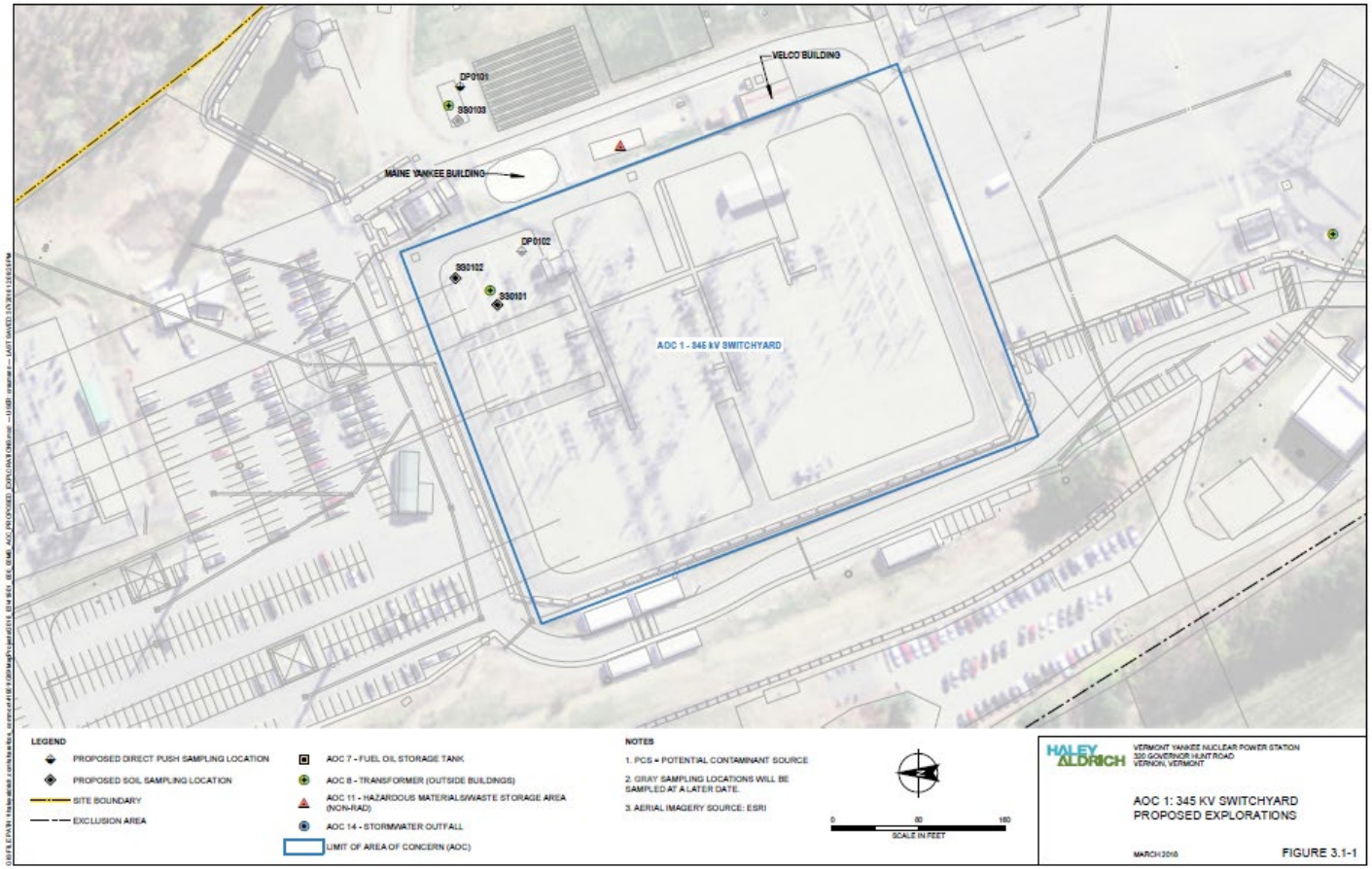
Initial Proposed Investigation

- Surface Soil Samples at Auto Transformer
- Subsurface Samples at Former Spare Main Transformer

Additional Proposed Investigations

- Subsurface Samples at Auto Transformer
- Surface Soil Samples at Former Spare Main Transformer
- Additional investigations if yard is dismantled

AOC 1 – 345 kV Switchyard



AOC 2 – 115 kV Switchyard

- Switchyard containing 99 kV Distributor Transformer and Keene Line, Bus Line, and Coolidge Line Breakers
- COCs include: PCBs, PAHs, metals, herbicides

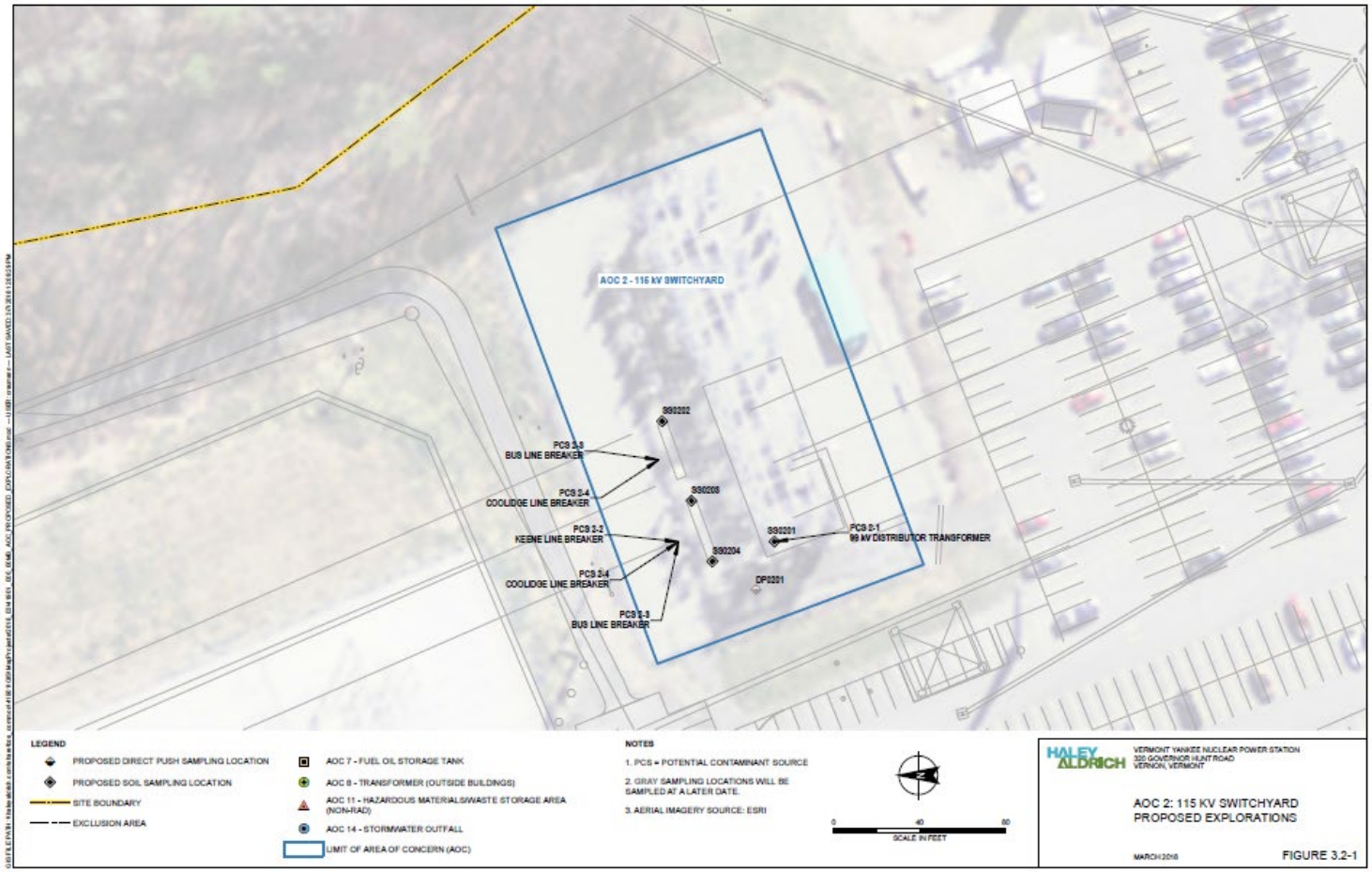
Initial Proposed Investigation

- Surface Soil Samples at the Transformer and Breaker locations

Additional Proposed Investigations

- Subsurface Samples at Transformer location

AOC 2 – 115 kV Switchyard



AOC 3 – Former South Warehouse

- Warehouse used for materials storage (virgin and waste oils, lead-acid batteries, other misc. materials)
- Area previously used for vehicle maintenance activities
- Several existing ASTs and former USTs
- COCs include: VOCs, SVOCs, metals, PCBs

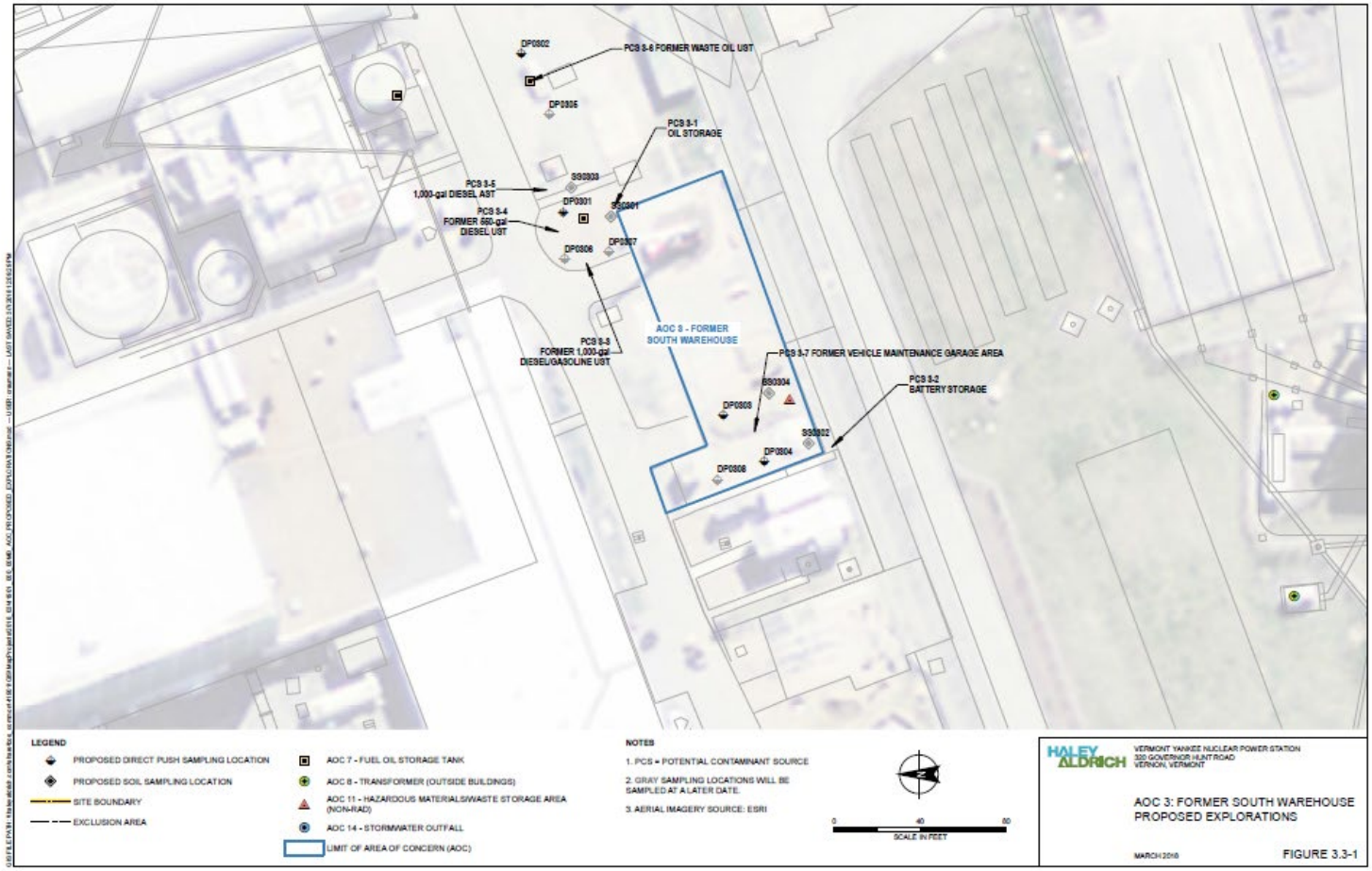
Initial Proposed Investigation

- Subsurface Samples from areas of existing ASTs and former USTs

Additional Proposed Investigations

- Subsurface Samples from former storage areas
- Surface Soil Samples from AST locations following asphalt/concrete removal

AOC 3 – Former South Warehouse



AOC 4 – Former North Warehouse

- Warehouse used for radiological and RCRA hazardous waste storage
- Contained furnace to burn used lubricant and fuel oils from AST
- Former diesel UST
- Lead and silver in paint on the structure
- COCs included: VOCs, SVOCs, metal, PCBs, dioxin

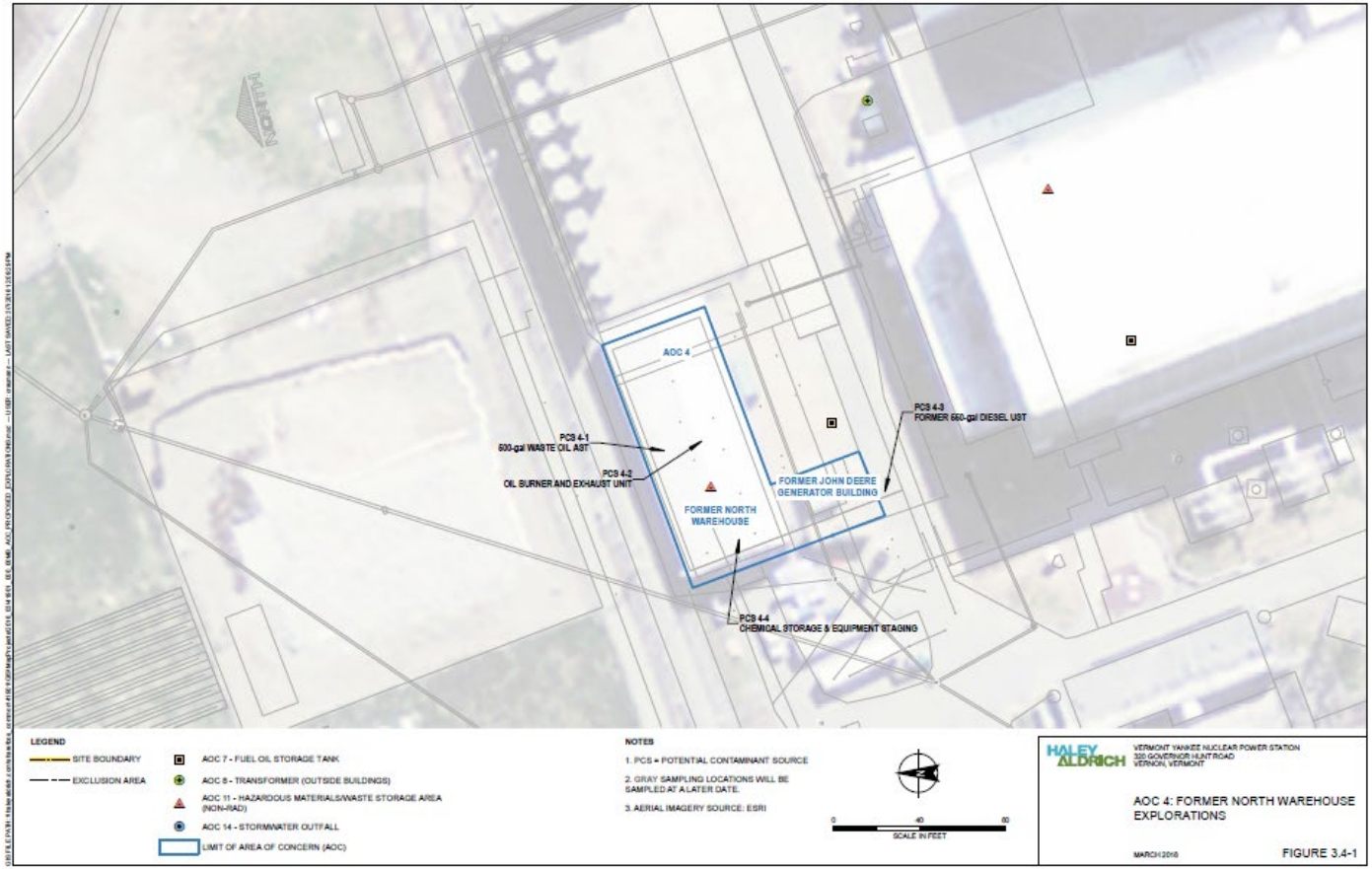
Initial Investigation Activities

- Building and components have been demolished/removed. Soil sampling completed with no results above Criteria
- UST removed, with ANR approval
- ANR approved investigation report.

Additional Proposed Investigations

- No further action required

AOC 4 – Former North Warehouse



AOC 5 – Turbine Building

- Previous leaks from UST reported, required LNAPL removal and monitoring
  - Site Management Activities Completed (SMAC) issued from VT ANR
- Chlorinated solvents detected in groundwater during UST investigation
- COCs include: VOCs, SVOCs, PCBs, metals. Current fuel oil AST, former fuel oil UST, former dry cleaning operations, interior transformers

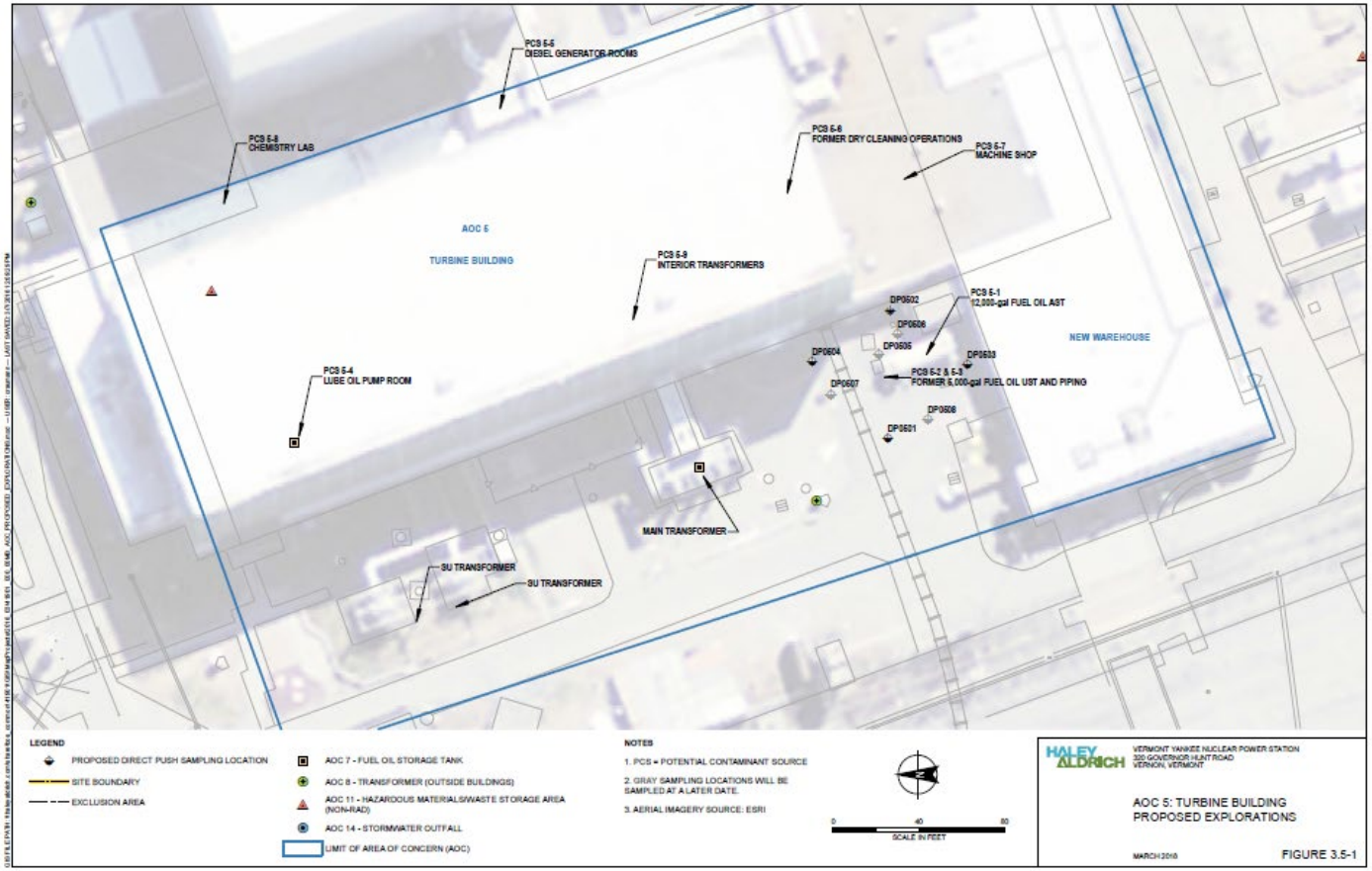
Initial Proposed Investigation

- Subsurface Samples from areas around the fuel oil tanks

Additional Proposed Investigations

- Subsurface Samples from additional areas around the fuel oil tanks and piping

AOC 5 – Turbine Building



AOC 6 – Radiological Waste Building and Tanks

- Building used for storage of radiological wastes being prepared for disposal off-site
- COCs include: VOCs, SVOCs, metals

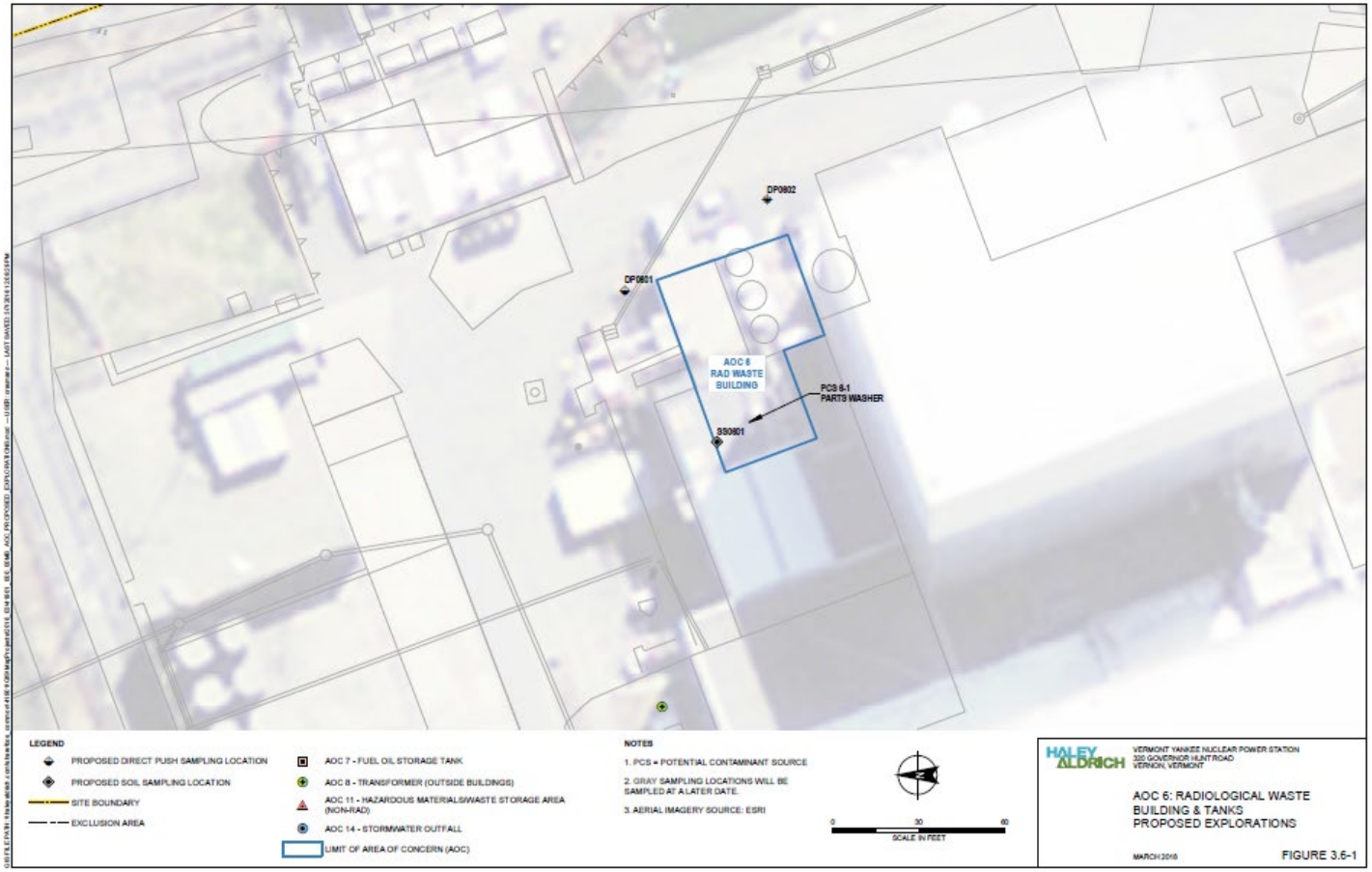
Initial Proposed Investigation

- Subsurface Samples from areas surrounding the building and tanks

Additional Proposed Investigations

- Dependent on initial investigation results

AOC 6 – Radiological Waste Building and Tanks



AOC 7 – Fuel Storage Tanks

- Six additional fuel storage tanks not associated with other AOCs
- Materials include fuel oil, diesel, gasoline, and waste oil
- No reported leaks/issues
- COCs include: VOCs, SVOCs, metals

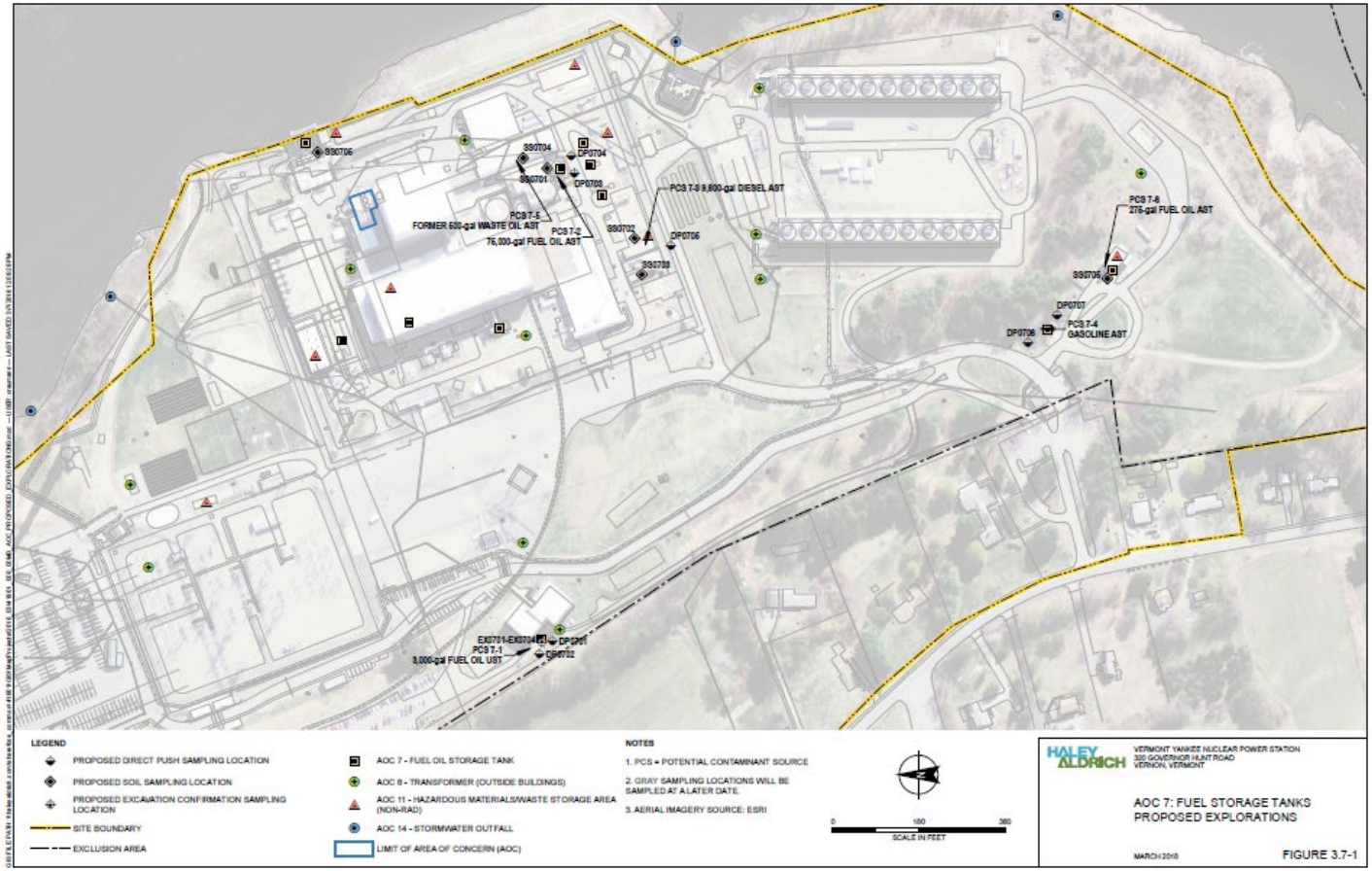
Initial Proposed Investigation

- Surface Soil Samples from each tank location
- Subsurface Samples from each tank location

Additional Proposed Investigations

- Dependent on initial investigation results

AOC 7 – Fuel Storage Tanks



AOC 8 – Transformers

- Ten additional transformers not associated with other AOCs
- Reported spill and fire in 2014 at the Main Transformer
- Previous report of explosion and fire at the Auxiliary Transformer
- COCs include: PCBs, dioxins, PFOAs (for fire suppressants)

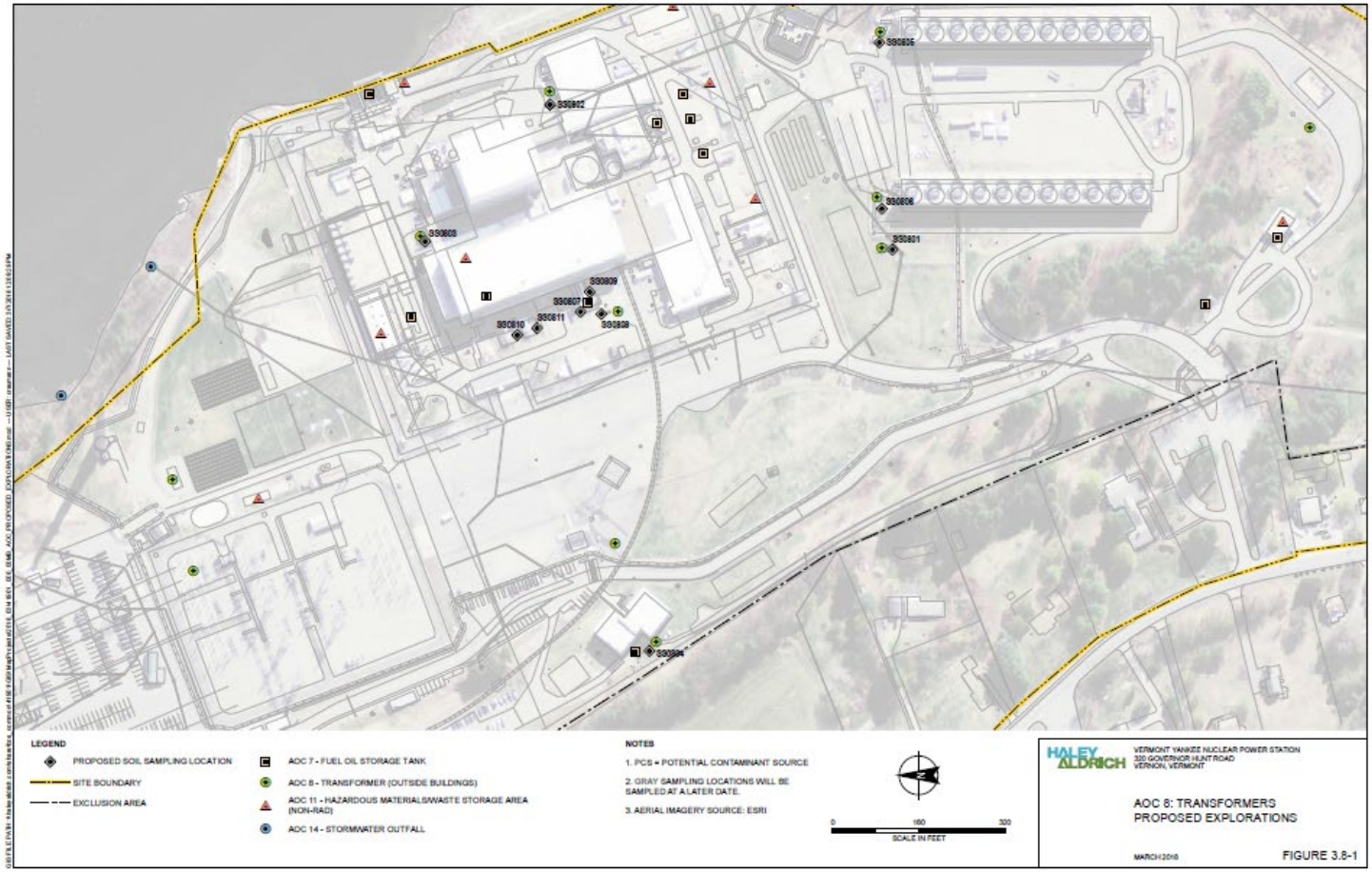
Initial Proposed Investigation

- Surface Soil Samples from each transformer location
- Subsurface Samples from each transformer location

Additional Proposed Investigations

- Dependent on initial investigation results

AOC 8 – Transformers



AOC 9 – Intake and Discharge Systems

- Both systems contained hydraulic gates to control flow with associated sump tanks
- Fuel oil AST within the Intake Building Structure
- No reports of spills/issues – components have been removed
- COCs include: SVOCs, sodium hypochlorite (bleach) and metals/PCBs associated with the coatings/paint

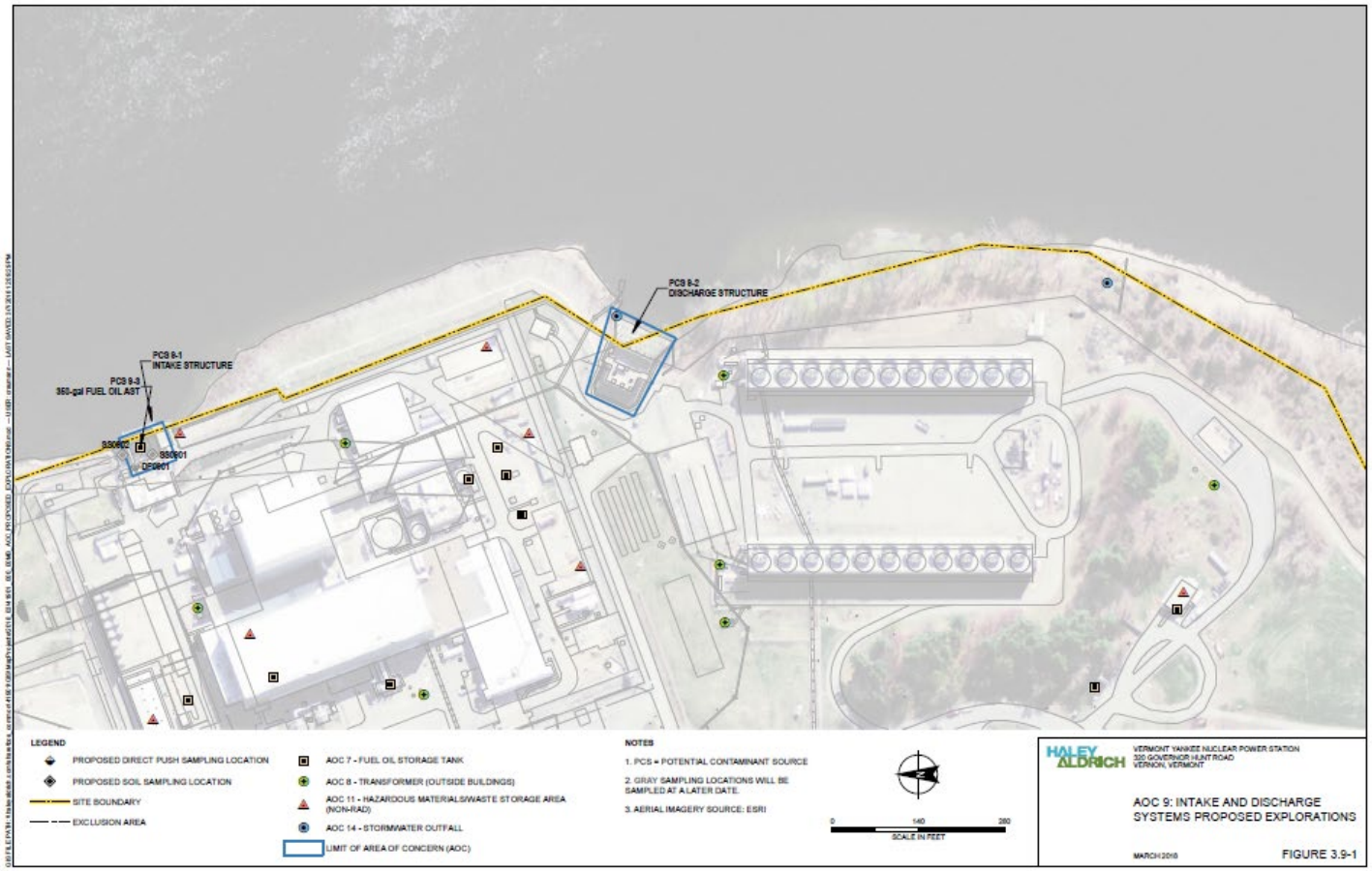
Initial Proposed Investigation

- Visual inspection following AST removal

Additional Proposed Investigations

- Surface Soil Sample at the AST location
- Subsurface Samples at the AST location following removal of tank and building

AOC 9 – Intake and Discharge Systems



AOC 10 – Parking Lots

- Three general parking areas onsite – Main Parking Lot, Plant Support Building Parking Lot, and Overflow Parking Lot
- Main and PSB Parking Lots paved, Overflow Lot gravel
- COCs include PAHs, TPH

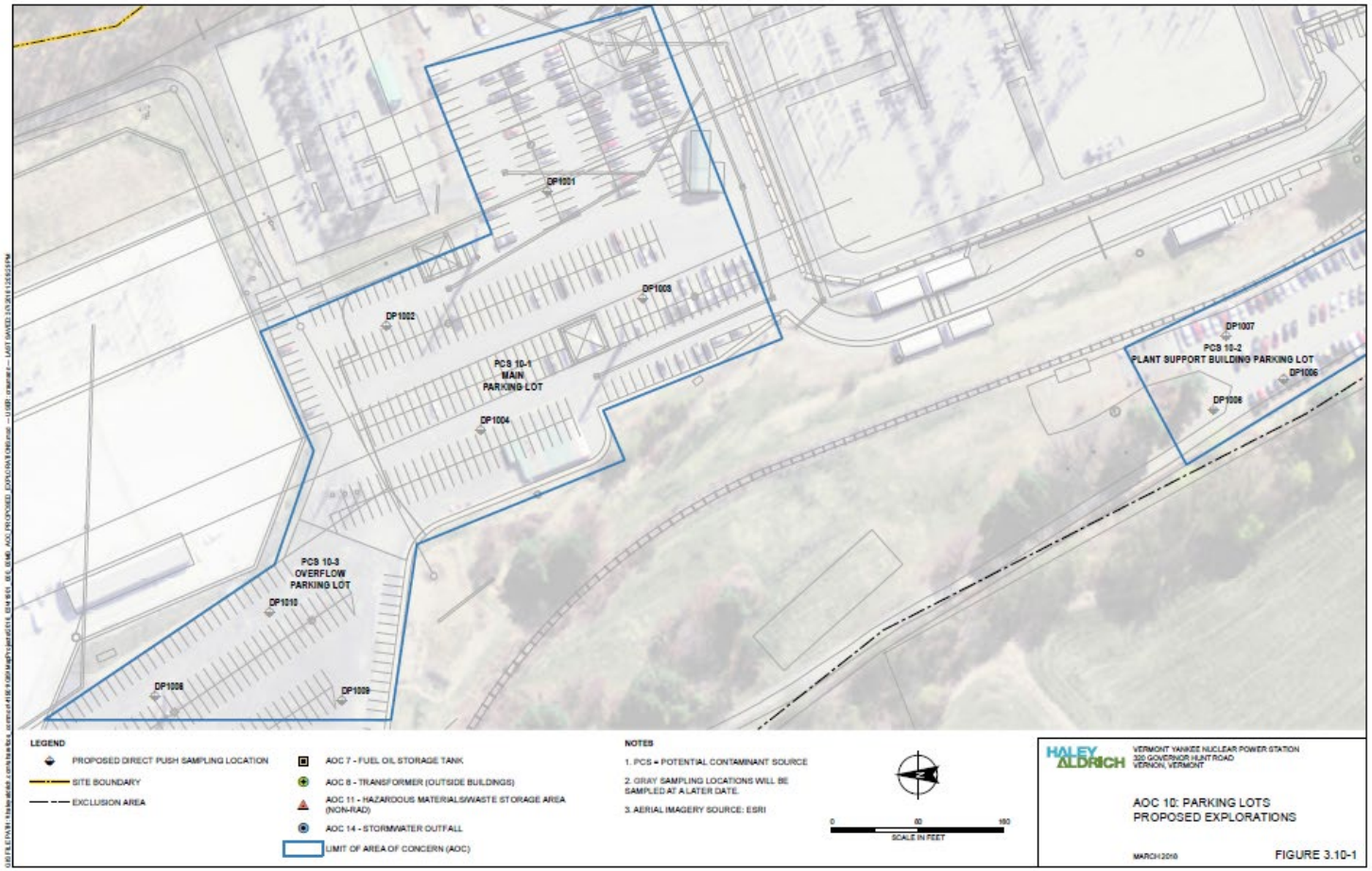
Initial Proposed Investigation

- Lots still in use – no current proposed activities

Additional Proposed Investigations

Subsurface Samples throughout the lots following termination of use

AOC 10 – Parking Lots



AOC 11 – Hazardous Materials Storage

NorthStar

- Short-term storage areas for universal and hazardous waste materials
- Located in small modular metal structures and an area within the site warehouse
- COCs include: VOCs, SVOCs, metals, PCBs

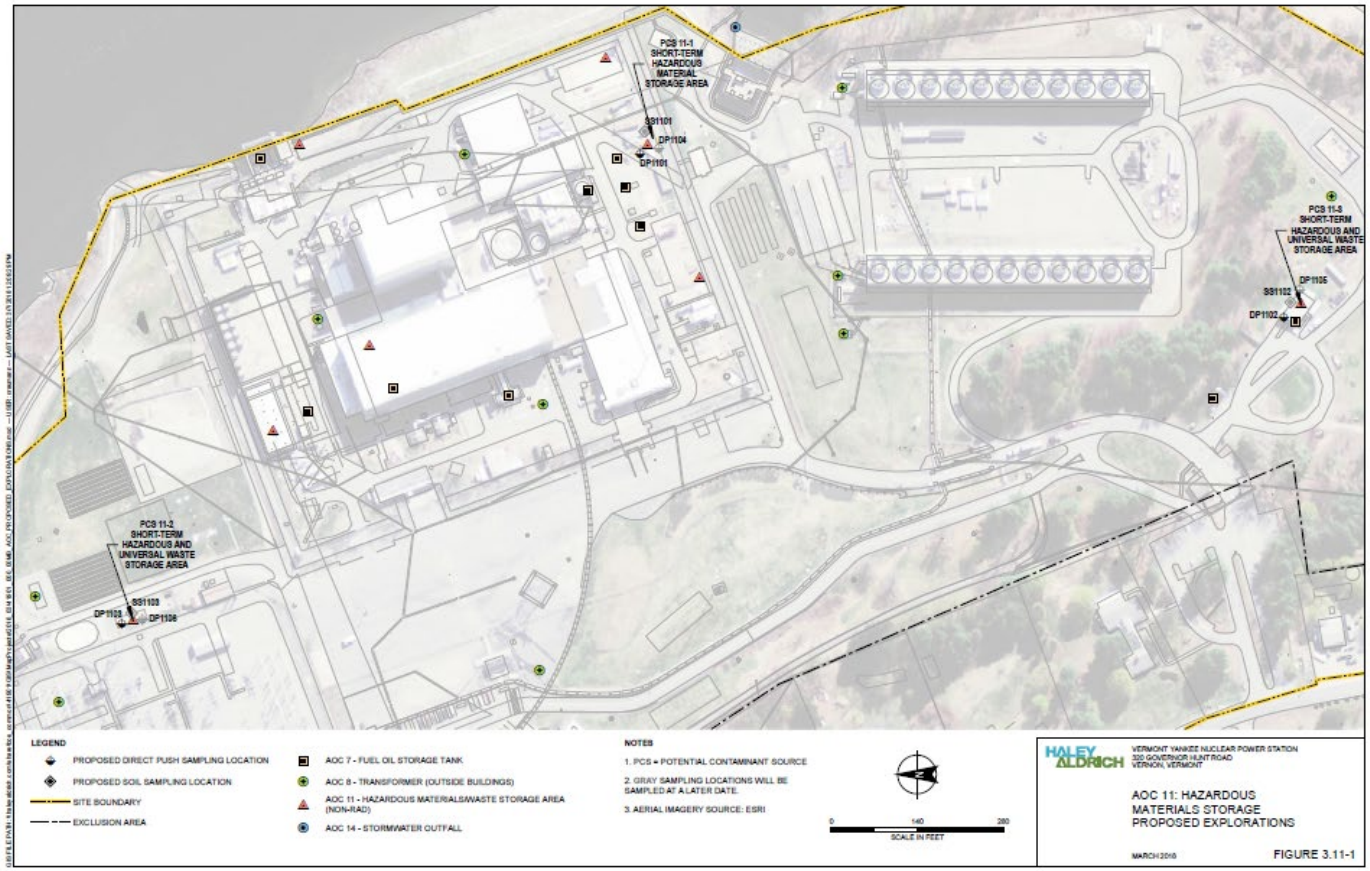
Initial Proposed Investigation

- Subsurface Samples at each location

Additional Proposed Investigations

- Surface Soil Samples at each location
- Subsurface Samples at additional locations surrounding the storage areas

AOC 11 – Hazardous Materials Storage



AOC 12 – Former Edson's Gulf Station and Garage

NorthStar

- Gasoline filling and automobile repair facility
- USTs removed and found to be leaking – investigation and remediation completed with SMAC designation in 2009
- Fuel oil AST still present
- COCs include: VOCs, SVOCs, metals, PCBs

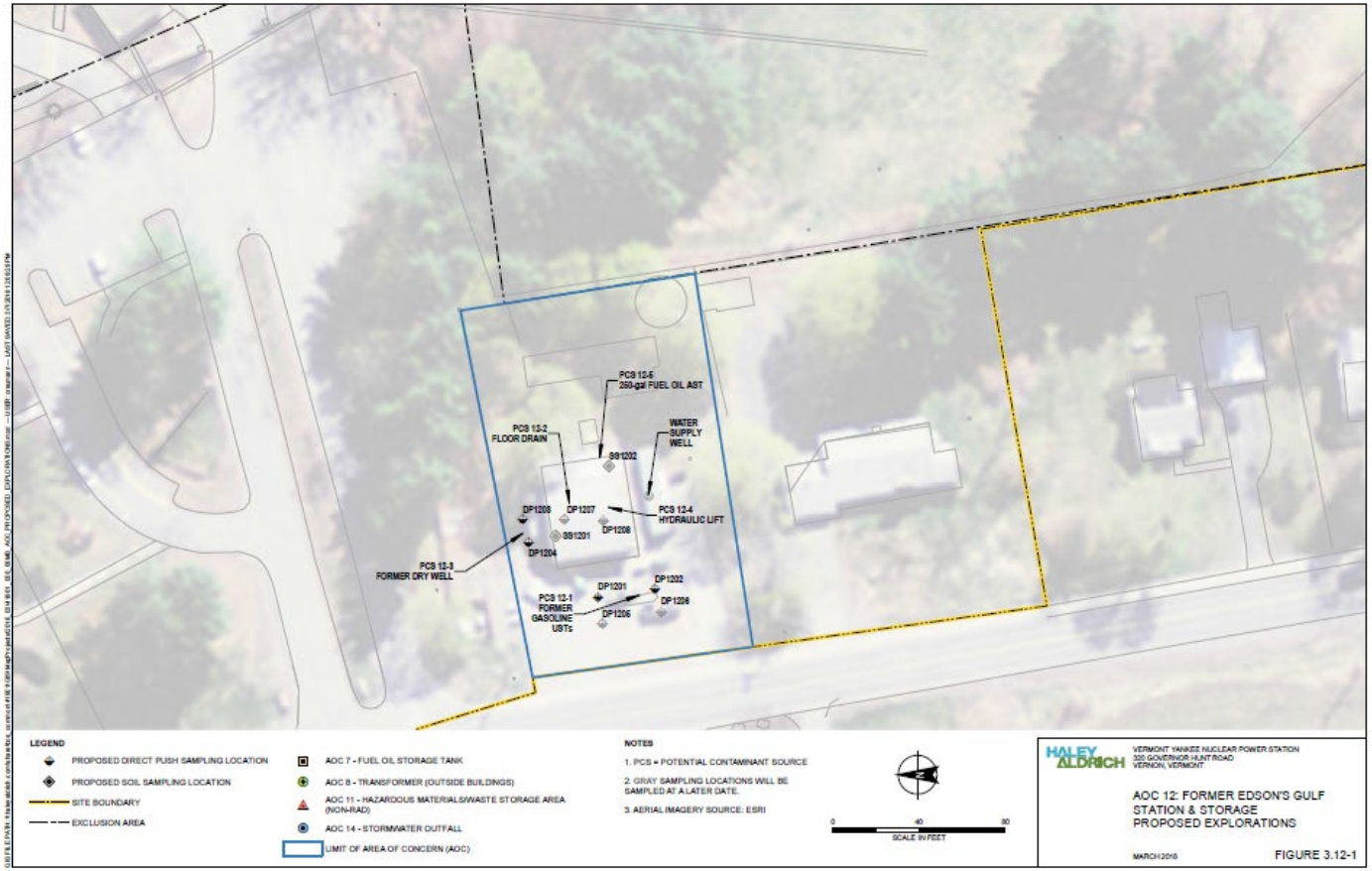
Initial Proposed Investigation

- Subsurface Samples by the former USTs and dry well

Additional Proposed Investigations

- Subsurface Samples by the former hydraulic lift and floor drain
- Surface Soil Samples if building is removed

AOC 12 – Former Edson's Gulf Station and Garage



AOC 13 – Septic Systems and Application Areas

- Six septic systems and two application areas onsite
- South Application Field contains low level radiological materials
- North Application Field never used for septic, but drums and debris observed
- COCs include: SVOCs and metals

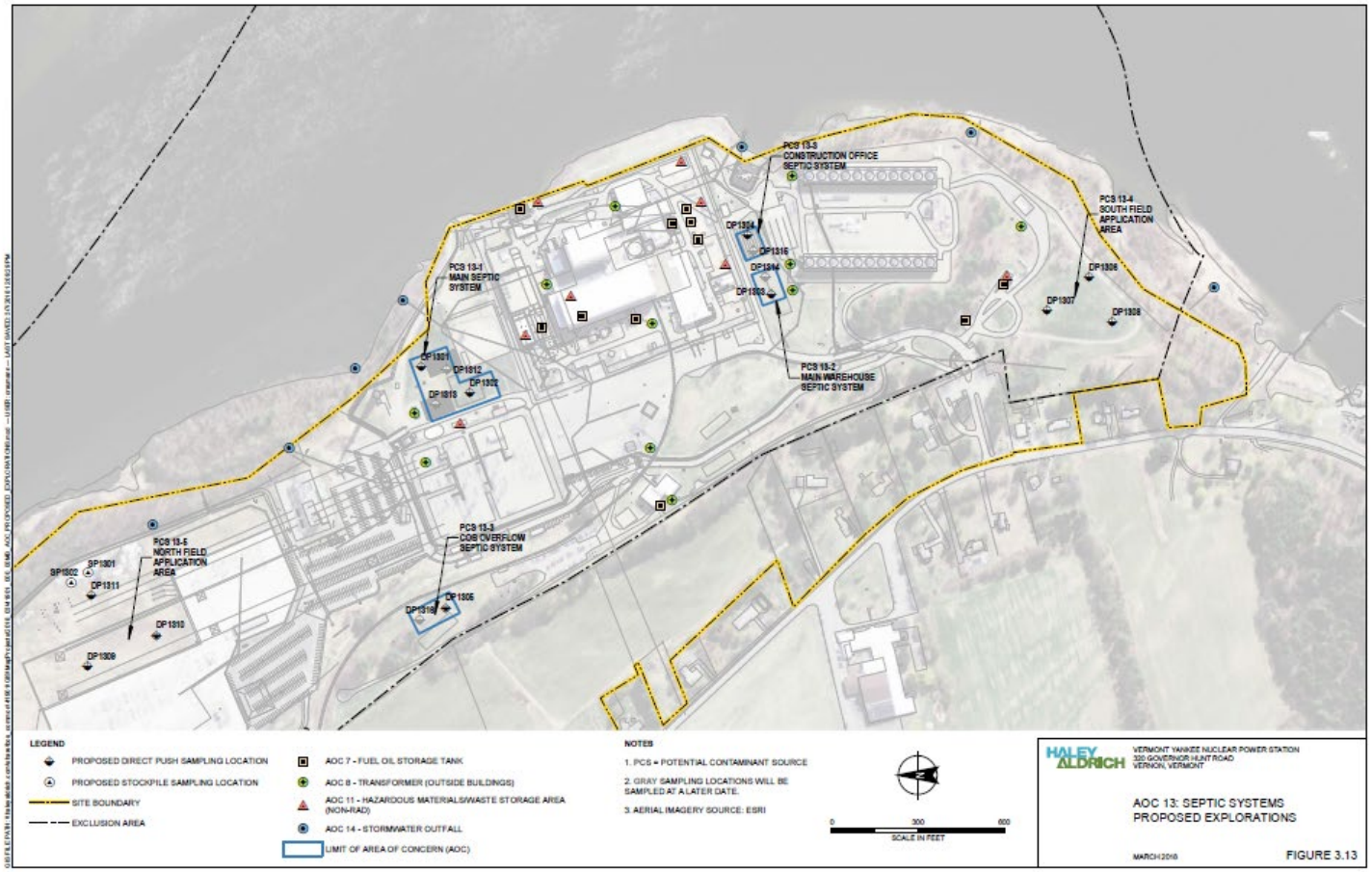
Initial Proposed Investigation

- Subsurface Samples throughout each septic and application area

Additional Proposed Investigations

- Subsurface Samples at additional locations within the septic and application areas

AOC 13 – Septic Systems and Application Areas



AOC 14 – Storm Water Outfalls

- Six main outfalls along the Connecticut River
- Oil/water separators in storm water systems
- No reported issues with systems or outfalls
- COCs include: metals and PCBs

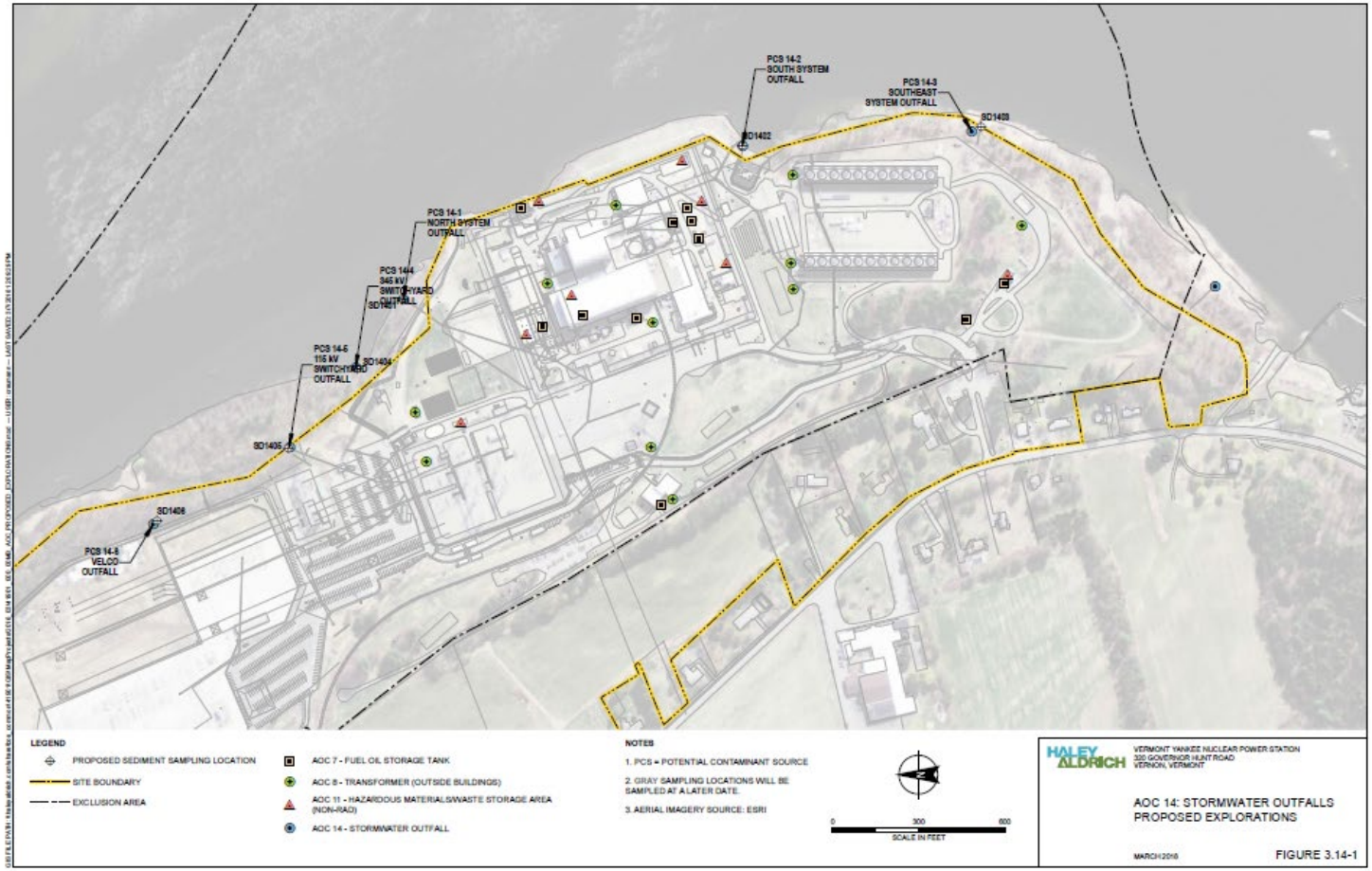
Initial Proposed Investigation

- Sediment Samples at each accessible outfall location

Additional Proposed Investigations

- Dependent on initial investigation activities

AOC 14 – Storm Water Outfalls



AOC 15 – Cooling Tower Area

- Supported by creosote-coated timbers reportedly
- Sediment storage area between the towers
- Equipment and materials laydown area SE of the towers
- COCs include: PAHs, metals, ACM, and PCBs

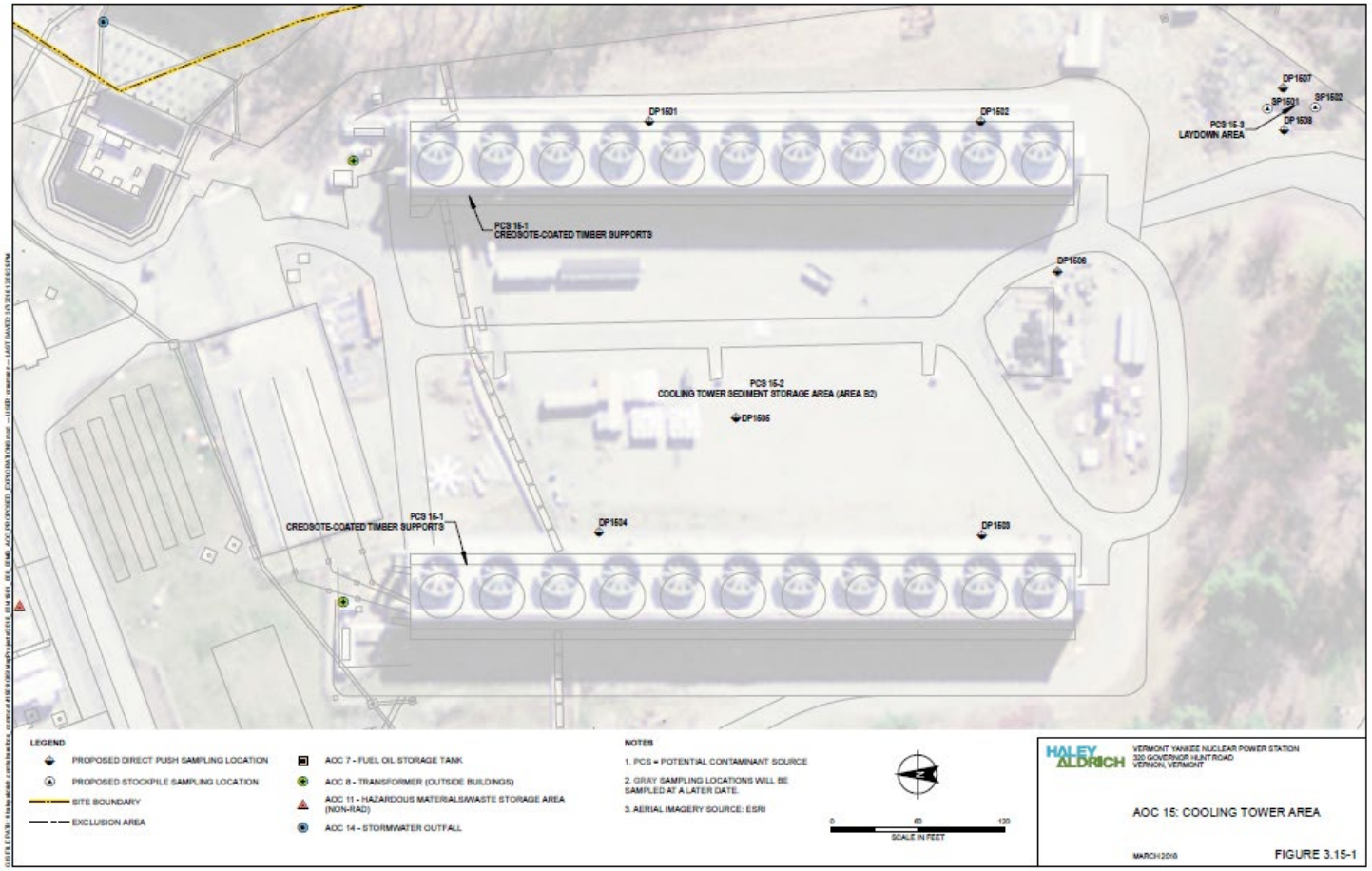
Initial Proposed Investigation

- Subsurface Samples from each of the areas
- Stockpile Samples from the sediment storage area

Additional Proposed Investigations

- Dependent on initial investigation activities

AOC 15 – Cooling Tower Area



AOC 16 – Groundwater

- Groundwater in overburden and bedrock, flows to the river, first encountered 15 to 10 feet below grade
- Robust groundwater modeling completed for the release associated with the AOG. Groundwater characterized for radiological constituents, but not for chemical parameters
- 31 wells to be samples quarterly per the groundwater monitoring program
- COCs include: VOCs, SVOCs, metals (PFOAs, PCBs where warranted)

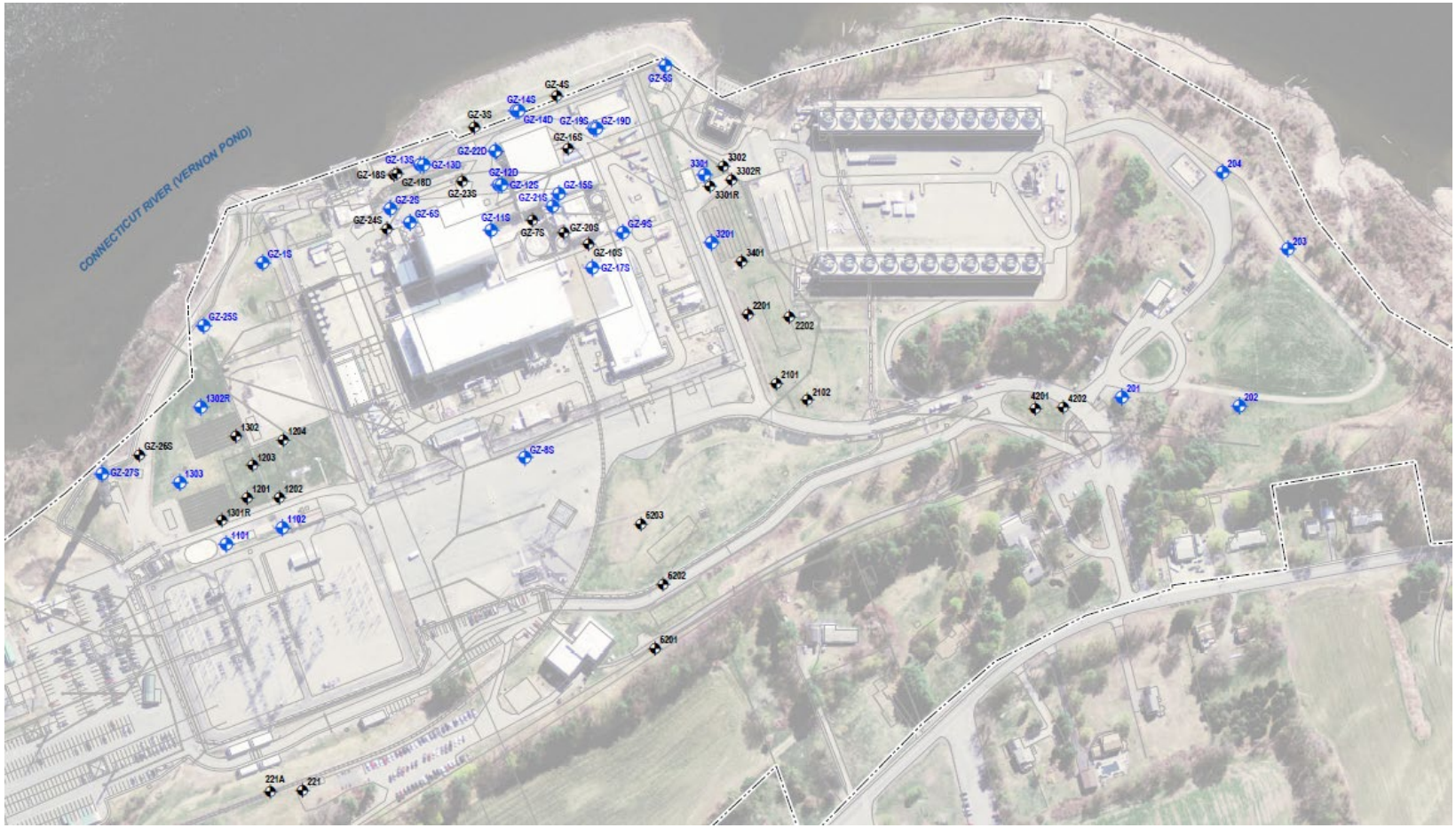
Initial Proposed Investigation

- Collect groundwater samples from selected wells
- Grab samples from piezometers at identified AOCs

Additional Proposed Investigations

- Collect samples to understand seasonal variation
- Bound impacted areas (vertically and horizontally)
- Refine groundwater conceptual site model as needed

AOC 16 – Groundwater



Groundwater Monitoring Plan

- Quarterly monitoring of Site wells
  - Well condition survey (condition of some wells and construction details not known)
  - Plan for quarterly samples for VOCs, SVOCs, and Metals.
  - PCBs and Petroleum will be collected for one round from wells located near current and former oil storage areas (i.e. USTs, ASTs, transformers, etc.)
  - PFOAs and dioxins will be collected for one round from wells near the main and auxiliary transformers
- Characterization work plan: collect grab samples from AOCs and from where soil/groundwater impacts are confirmed, additional wells will be added
- 4 quarters of clean samples, specific parameters/analyses may be discontinued
- If no contaminants exceed the GWPC criteria, and no sources identified up gradient, sampling of that well may be discontinued

Building Characterization Work Plan

Developed to understand:

- IH concerns with paints and coatings
- Off-Site disposal disposition
  - Hazardous Materials
  - Lead Based Paint
  - PCBs/EPA Toxic Substance Control Act compliance
  - Asbestos Containing Material

Initial characterization effort completed in 2017

- Coatings, paint, roofing materials, and caulks tested
- Total and TCLP Metals and PCBs
- Limited areas of impacted materials
  - All types of paint tested
  - 10 types of cables tested for PCBs
- All buildings and structures tested
  - Facilitates removal of minor structures (sheds, shacks, support buildings) when needed

As soils are exposed, survey (and possibly sample) soils to document conditions

NorthStar

Building Characterization Results

- A total of 126 samples have been collected to-date from building materials (paints/coatings, siding, caulking, concrete, roofing)
- No PCBs detected above US EPA TSCA thresholds
- Lead-based paint discovered in several buildings
- Lead and mercury detected above RCRA Hazardous Waste criteria in 15 total samples
- ACM detected in one caulking sample

Borrow Materials Import Plan

NNDC will require fill to be placed on site to backfill deeper basements

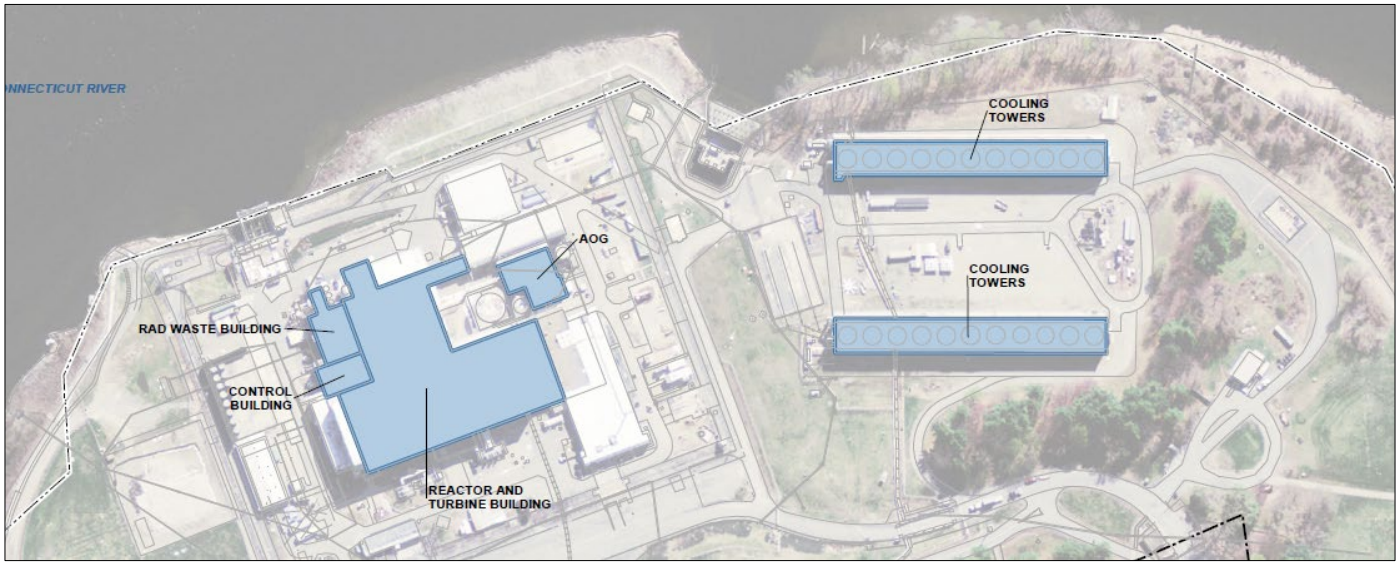
Borrow pit/fill sources will be reviewed prior to acceptance, supported by laboratory testing to confirm that the soil meets ANR criteria

- Borrow pits will provide virgin sands and gravels
- Samples will be collected at a frequency of approximately 1 per 1,000 cubic yards
- Source materials will be free of debris
- Locally sourced to minimize truck traffic

Below Grade Structure Survey Work Plan

Deeper Basement Structures to remain on site below 4 feet bgs

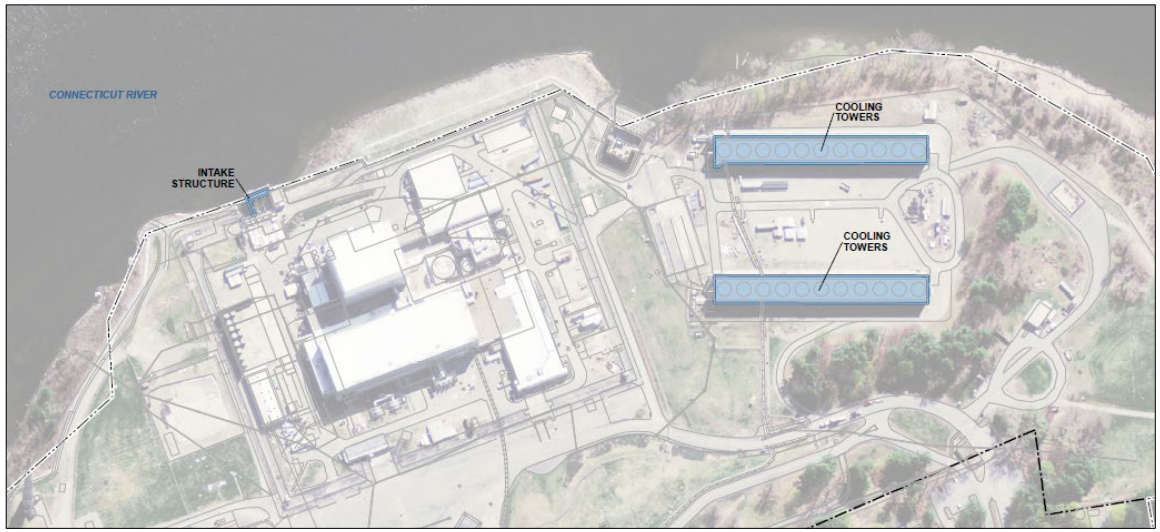
- Turbine Building
- Reactor Building
- Radwaste Building
- Service/Admin Building
- Advance Off Gas Building
- Cooling Towers
- Intake and Discharge Structures
- Tunnels and Piping



Concrete Reuse Plan

Per the MOU, concrete from the cooling towers and the intake structures may be reused

- Samples for metals if not coated
- If coated/painted, metals, TCLP metals and PCBs
- Visual survey for stained areas
  - Then sample for SVOCs and PCBs as warranted



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Glucksberg, Nadia

From: Noyes, Gerold <Gerold.Noyes@vermont.gov>
Sent: Thursday, April 4, 2019 1:27 PM
To: Glucksberg, Nadia
Cc: Daniels, Corey; Langub, Nelson; Fekert, Dennis; Gonda, Jordan; Simoes, Steve; Irwin, William; Kinnick, Christopher; Tom Broido
Subject: Please see the attached letters reviewing the Haley & Aldrich site investigation workplans for NorthStar Vermont Yankee
Attachments: 2019-0404.DEC.workplan.comments.let.pdf; 280EM00400 VY BuildingChar Report Review.pdf; 280EM00400 VY QAPP Report Review.pdf; 280EM00400 VY SIWP Report Review.pdf

Good afternoon Nadia,

Attached please find the DEC review letter for the previously submitted H&A Non-Radiological Sampling, Building Characterization, and Quality Assurance Project Plans. Additional comments were provided by ATC Group Services under contract to the DEC. ATC comments are provided in three accompanying letters prepared by the individual reviewer.

The Vermont Department of Health is reviewing the Building Characterization Plan since it also covers lead and asbestos sampling for abatement and industrial hygiene, which come under DOH jurisdiction.

Please e-mail or call me with any questions, if I can't answer them I will forward them to the correct person.

Regards,

Gerold Noyes, PE

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AGENCY OF NATURAL RESOURCES

April 4, 2019
E-mail

NADIA GLUCKSBERG
HALEY & ALDRICH, INC.
75 WASHINGTON AVE, SUITE 1A
PORTLAND, ME 04101
NGlucksberg@haleyaldrich.com

RE: Vermont Yankee DEC work plan comments

Dear Ms. Glucksberg:

The Vermont Department of Environmental Conservation Waste Management and Prevention Division (WMPD) has reviewed the site investigation plans submitted by Haley & Aldrich, Inc. (H&A) on behalf of NorthStar. Additional comments were provided by ATC Group Services, Inc. under contract to the DEC. ATC comments are provided in three accompanying review letters prepared by the individual reviewer. Unless otherwise addressed in this letter, the ATC comments should also be addressed in the H&A response.

The DEC and ATC reviewed the following documents (background documents were provided to ATC as necessary to provide project history and context):

Limited Non-Radiological Site Sampling Plan, Rev. F, Vermont Yankee Nuclear Power Station, Vernon, Vermont, Haley & Aldrich, 13 February 2019.

Limited Building Characterization Completion Report, Rev. C, Haley & Aldrich, February 2019.

Quality Assurance Project Plan, Rev. E, Characterization of Environmental Media Decontamination and Decommissioning Support, Vermont Yankee Nuclear Power Station, Vernon, Vermont, Haley & Aldrich, February 2019.

Limited Non-Radiological Site Sampling Plan

§3.5 The use of cutting oil containing PCBs in the machine shop should be considered and sampled appropriately, if staining exists or it cannot be documented that non-PCB cutting oil was used.

§3.8 Was the firefighting foam used by the Vernon fire department or by plant personnel. If the foam was stored at the plant, where? If the foam was in a fire suppression system, then where was it and were there other locations with suppression systems? Was there a fire fighting training location on site and

over

was foam used? flammable liquids? PFAS testing should cover these locations if necessary, not just at the 2014 Main Transformer spill and fire.

§3.12 Is there a report available from the 2015 DB Environmental Consulting floor drain investigation available? Please provide.

§3.15 See global comment regarding 'typical background ranges'.

Table 3.0-2 These soil screening values should be updated with the values listed in the 2019 Investigation and Remediation of Contaminated Properties Rule (available July 2019).

Table 3.12-2-AOC 12, DP1201 and DP1202 Include also borings at the former pump island for Edson's Gulf Station and Garage.

Table 3.13-2-AOC 13, SP1301 and SP1302 what is this stockpile? VOC samples should not be composited.

Appendix A Below-Grade Structure Survey Workplan

§2.2 Any floor drains, sumps, drainage structures, etc. and associated outfall pipes, drywells, etc. in these below-grade structures should be identified and assessed for contamination. They should be sampled if necessary. If water drains from or is pumped from these below grade structures it should be sampled and the disposal location (leachfield, drywell, infiltration gallery, etc.) of this water should be identified and sampled.

§2.3 Will samples be taken of coatings on the outside (i.e. soil side) of sub-surface structures? If so how? Will any samples of soil or groundwater be taken from below or adjacent to left-in-place structures?

Appendix B Borrow Materials Import Plan

The WMPD does not have any comments to the Borrow Materials Import Plan, that are in addition to those in the ATC review letter

Appendix C Groundwater Monitoring Plan

§3.3.2 Metals samples should not be filtered, and total metals should be reported.

Table 2 GZ-8S, Add TPH down gradient of parking lot.

Table 2 GZ-22D, What was the depth of the COB well? Does GZ-22D reach that depth or the depth of water bearing fracture(s) in the COB well?

Table 2 Well ID 201 & 202, MW-201 & -202 are too far away from Edson's to prove that there was no release.

Appendix D Concrete Reuse Plan

The WMPD does not have any comments to the Concrete Reuse Plan, that are in addition to those in the ATC review letter.

Limited Building Characterization Completion Report

We concur with all ATC comments related to building characterization for non-radiological contaminants including PCBs and metals (total/TCLP). In addition to those comments, the WMPD has the following additional comments:

Executive Summary, Page i, Waste Control Specialists bullet: The word "materials" at the end of the first sentence should be replaced with "waste".

Executive Summary, Page i, In State Disposal bullet: The statement in the first sentence that "…universal waste that does not have any radiological contamination… may be disposed at… Casella Waste Systems" is incorrect. Universal wastes are subject to regulation under Subchapter 9 of the VHWMR and must disposed at a "destination facility" (defined in VHWMR § 7-911).

Section 3. (Scope of Work), second bullet (Building Materials): This section should be revised to be consistent with Section 4.5 (Sampling Activities/Siding) by stating that siding materials are also characterized for TCLP metals in addition to asbestos containing materials and PCBs

Section 4.3 (Concrete): Concrete samples should be taken in the vicinity of caulk-filled expansion joints and analyzed for PCBs (e.g., basement floor of reactor building). In addition, the bottom surfaces of concrete floor trenches in the reactor building basement should be sampled for metals and PCBs.

Section 6 (Sample Results): The number of paint (and other) samples found to contain lead and mercury in concentrations exceeding TCLP limits is concerning. A more thorough investigation for lead and mercury (focusing on the types/colors of paints found to contain these contaminants) should be completed (unless North Star chooses to ship all such material for disposal as hazardous waste to a RCRA Subtitle C permitted facility.

Quality Assurance Project Plan

§4.3.2.2, VOC samples should not be composited or aerated by homogenizing.

§8.2.1, Please check the RPD formula; as written the RPD will always be 50%

Global Comments

Soil screening values should be updated with the values listed in the 2019 Investigation and Remediation of Contaminated Properties Rule. In addition the most current soil vapor intrusion screening values, groundwater, drinking water and surface water standards should be used. The 2019 rule will be submitted to the Secretary of State on April 8 and the public comment period will be announced shortly thereafter; the rule is anticipated to be adopted in July 2019.

Drainage structures such as floor drains, sumps, and curtain drains with their associated outfalls, drywells, pump stations, daylight, oil/water separators, and leachfield connections should be investigated for each building, parking lot or other structure.

There are references to the 2012 Investigation and Remediation of Contaminated Properties Procedure. This has been superseded by the 2017 Investigation and Remediation of Contaminated Properties Rule, which will be superseded in July 2019 by the revised Investigation and Remediation of Contaminated Properties Rule.

If results are to be reported as 'below background' these background levels should be stated and referenced. If a site-specific background contamination study is be performed this study should follow Appendix B of the Investigation and Remediation of Contaminated Properties Rule (2017, unchanged in 2019).

Please feel free to contact me if you have any questions.

Sincerely,

Gerold Noyes, P.E.
Environmental Engineer
Sites Management Section

ATC Review letters attached:

Vermont Yankee Nuclear Power Station Non-Radiological Site Sampling Plan, Rev. F Document Review
Vermont Yankee Nuclear Power Station Building Characterization Document Reviews
Vermont Yankee Nuclear Power Station Quality Assurance Project Plan, Rev. E Document Review

CC: Corey Daniels, NorthStar
Nelson Langub, NorthStar
Dennis Fekert, VT DEC Solid Waste Program
Jordan Gonda, VT ANR DEC Attorney
Steve Simoes, VT DEC Hazardous Waste Program
Bill Irwin, ScD, VT DOH, Radiological Sciences Chief
Christopher Kinnick, VT DOH, Asbestos and Lead Program Interim Chief
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March 22, 2019

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Department of Environmental Conservation
Sites Management Section
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Transmitted via electronic mail to: Gerold.noyes@vermont.gov

RE: Vermont Yankee Nuclear Power Station
Non-Radiological Site Sampling Plan, Rev. F Document Review

Dear Mr. Noyes,

The Vermont DEC has retained ATC Group Services, LLC (ATC) to provide expertise and consultation on the remediation and restoration of the Vermont Yankee Nuclear Power Station (VYNPS) in Vernon, Vermont (Contract #37779). The following letter report is provided in response to your request for ATC to perform document reviews related to the above referenced project.

Scope of Work

This report documents the ATC review of the following documents:

- Limited Non-Radiological Site Sampling Plan, Rev. F, Vermont Yankee Nuclear Power Station, Vernon, Vermont, Haley & Aldrich, 13 February 2019.
- The following documents were also reviewed to support comments provided in the above Site Sampling Plan.
    - Phase I ESA, VT Yankee Nuclear Power Station, Normandeau, August 9, 2017
    - NR Historical Site Assessment, VT Yankee Nuclear Power Station, H&A, Sept 2014
    - Site Assessment Study, Entergy VT Yankee, October 2014
    - Draft Voluntary Corrective Action Plan, Rev C VT Yankee, H&A, Nov 2017
    - Draft Historical SC Report, Rev D, VT Yankee Nuclear Power Station, November 8, 2017

Comments:

Page 5: Commented [JH1]

Table of Contents, Figure 1-2, What are the source(s) of the soil piles on the northern portion of the property depicted on Figure 1-2? Are these the two soil piles observed during the 3/15/19 site visit? During the 3/15/19 site visit two soil piles appeared to be located more along the northwestern corner of the property. It was explained that the recent soil pile covered in black poly sheeting was generated from the ongoing railroad track work and the other larger vegetated pile was generated during construction of the ISFSI pad. It was explained that the larger pile had been tested for site COCs and no exceedances of regulatory standards were reported. Will the smaller soil pile from the railroad excavation be tested for

site COCs and how will both of these soil piles be managed in the future? Please verify the above regarding the soil piles.

Page 1: Commented [JH2]

Section 1.1, Do these AOCs that were SMAC'd in accordance with outdated IROCCP need to be reevaluated in accordance with more recent IRule requirements?

Page 2: Inserted

t

Page 3: Commented [JH3]

Section 1.3.1, Per IRule (35-302), a CSM is supposed to be included in Sampling Plan/Work Plan. Although some components are included in this Sampling Plan, a CSM is not included.

Page 3: Commented [JH4]

Section 1.3.1, Is ECCA requirement waived prior to proceeding to Corrective Action Plan?

Page 5: Commented [JH5]

Section 2.1, How will shallow soil samples be collected for lab testing if all soil from 0-5 feet bgs removed using vacuum methods? Will hand tools be used to collect shallow soil samples?

Page 6: Commented [JH6]

Section 3.0, Why aren't shallow soils along the railroad tracks listed as an AOC? COCs on RR tracks can include VOCs, SVOCs, herbicides, metals.

Page 6: Commented [JH7]

Section 3.1, This TPH Soil Reuse Criteria is outdated. The IRule uses TPH DRO of 440 mg/kg. Will the results of the 2009 TRC excavation be evaluated with respect to the IRule criteria?

Page 6: Commented [JH8]

Section 3.1, We cannot locate PCS 1-2 on Figure 3.1-1. There is a PCS 1-1 and PCS 1-3.

Page 7: Commented [JH9]

Section 3.1.1, Do these investigation/remediation results need to be re-evaluated in context of IRule? 1,000 mg/kg criteria is no longer applicable. TPH DRO is now 440 mg/kg.

Page 7: Commented [JH10]

Section 3.1.2, What is the sample collection depth interval for surface soil samples? What is the subsurface soil sample collection depth interval? This same question applies to subsequent AOC sections.

Page 7: Commented [JH11]

3.1.2, Table 3.1-2 indicates that only PAHs and PCBs will be analyzed. Table does not include VOCs, TPH or metals as stated in this section of the text. Please clarify.

Page 7: Commented [JH12]

3.1.2, What do you mean by "not all samples will be submitted for analyses"?

Page 7: Commented [JH13]

3.1.2, Please define "impacted", does this imply samples that exceed a SSV in Table 3.0-2 will trigger groundwater sampling? This same question applies to subsequent AOC sections.

Page 7: Commented [JH14]

What criteria determines the sample collection depth of the deeper subsurface soil sample? Will it be based on visual staining, olfactory, field screening, water table, or other? This same question applies to subsequent AOC sections?

Page 7: Commented [JH15]

Section 3.2.1, In AOC 1, where the concern are leaks from transformers, COCs recommended for laboratory testing also included VOC, TPH, and metals in addition to PAHs and PCBs. Why aren't these COCs also included in AOC 2 where transformer oils are suspected?

Page 8: Commented [JH16]

In Section 3.3, Has this portable AST always been staged at the same location when not fueling vehicles. Says "in the vicinity" is one soil sample sufficient?

Page 8: Commented [JH17]

Section 3.3, Were DEC UST Closure Site Assessments completed for each UST system (UST, piping, and dispensers)? If not, will need to contact UST Program to determine if formal UST "Post" Closure Assessments required in addition to proposed soil sampling.

Page 8: Commented [JH18]

Section 3.3.1, Has this effort to obtain tank closure assessment documentation been completed yet?

Page 8: Commented [JH19]

Section 3.3.1, See comments in above sections pertaining to types of analysis not matching what is listed in associated Sampling Rationale Tables.

Page 9: Commented [JH20]

Section 3.4.1, Were discharge points of floor drains identified and investigated? Previous report indicates that sediments located in the piping had detectable concentrations of COCs, but suggested if release had occurred to subsurface soils the concentrations would be below SSVs.

Page 11: Commented [JH21]

Section 3.5, Any underground feed lines (from tank to boiler) should be assessed as well for releases.

Page 11: Commented [JH22]

Section 3.5, Will OWS and floor drain piping be removed or plugged? Subsurface assessment and possible testing of soils should be conducted at the OWS or upon removal of OWS.

Page 11: Commented [JH23]

3.5, See above. Same question/comment applies to this OWS/floor drains as made above.

Page 11: Commented [JH24]

Section 3.5.1, Same comment from previous section, what criteria will be used to determine which samples will be submitted for analyses? Visual, olfactory, field screening methods?

Page 12: Commented [JH25]

Section 3.5.1, How will H&A's subslab evaluation be conveyed to VTDEC? If H&A's evaluation determines that characterization below the slab is warranted how will this work proceed? Will a supplemental Sampling Plan/Work Plan be submitted or another approval process be implemented?

Page 12: Commented [JH26]

Section 3.5.1, Assessment protocols should exists for all slab removals (including those in subsequent sections of this Sampling Plan) such as visual inspections, field screening, etc.

Page 12: Commented [JH27]

PFAS has been discovered at several drycleaner sites and should be considered as a test parameter at PCS5-6.

Page 12: Commented [JH28]

Section 3.6, Sampling rationale indicates that soil sampling/testing will be conducted only if "evidence of contamination is observed" or if a pathway exists. What criteria is being used to determine if release has occurred? Visual, olfactory, field screening methods?

Page 12: Commented [JH29]

Section 3.6.1, See comment/question from above about what criteria is being used to make release determination warranting lab sampling.

Page 12: Commented [JH30]

PCBs not listed in the table 3.6-1

Page 12: Commented [JH31]

Section 3.7, Soils borings should be installed at the dispenser and AST fill pipe areas, preferable immediately downgradient of each feature and at any noticeable surface stained areas.

Page 12: Commented [JH32]

Section 3.7, Based on the 3/15/19 site visit this AST is currently located inside the building on a slab foundation and within double containment. Soil boring(s) are recommended along exterior of building at fill and vent pipes.

Page 13: Commented [JH33]

Section 3.7.1, Are there plans to removal all the UST systems? UST removal should follow VTDEC UST Closure guidelines.

Page 13: Commented [JH34]

Section 3.7.1, All subsurface tank piping and dispensers should be assessed for releases. Piping and dispensers are considered part of the tank system.

Page 13: Commented [JH35]

Similar question/comment to above sections. How is field determination made that there is impact? Is determination based on visual, olfactory, field screening? VTDEC allows use of portable PID to collect soil headspace samples for assisting in determination of petroleum fuel hydrocarbons (i.e., heating oil , diesel, and gasoline) impacted soil and groundwater.

Page 13: Commented [JH36]

Section 3.8, Be cognizant of TSCA
requirements.

Page 13: Commented [JH37]

Section 3.8, Why do some transformer PCSs have TPH included in analyses and some don't. We recommend any PCS with transformer include TPH DRO, VOCs, metals testing to compare to IRule SSVs.

Page 14: Commented [JH38]

Section 3.9, Table 3.0-4 indicates 4 samples will be collected but Table 3.9-1 indicates 3 samples. Please clarify.

Page 14: Commented [JH39]

Section 3.10, We recommend adding one additional soil boring immediately downgradient of the salt shed building and collect grab sample to evaluate groundwater impact from salt storage activity. Also, this soil boring could also evaluate if any impact from potential OHM releases at attached car port where tractor and miscellaneous motorized equipment is stored. I also recommend two additional soil borings and a grab groundwater sample at the two "dog pound" buildings just north of the Main Parking Lot. There were empty drums located in this area and a herbicide applicator. Also, complete historical use of these buildings and area is not known. Furthermore, there is no groundwater data from this area of the site or are there any existing monitoring wells.

Page 15: Commented [JH40]

Section 3.11, During the 3/15/19 site visit there was discussion if the pipe storage building (located north of PCS 11-1) may have also stored haz waste. If this can be confirmed, sampling for appropriate COCs should be conducted.

Page 16: Commented [JH41]

Section 3.12, Please confirm that all hydraulic oil was purged from the piston and associated lines prior to decommissioning. If not, this needs to be done.

Page 16: Commented [JH42]

Section 3.12.1, Unless previously completed as part of the SMAC, I recommend 1-2 soil borings and grab groundwater samples at downgradient end of lot (east side) extending to GW table. There are no samples proposed for this area. Also, please verify what appears to have been 3 former structures located east of the garage building. The outline of these structures show up on Figure 3.12-1, but were not present during the 3/15/19 site visit. Any idea what these structures were used for and why they were removed?

Page 16: Commented [JH43]

Section 3.13 It is not clear if groundwater sampling will be completed at each of the three septic systems of concern either with grab sampling or from existing monitoring wells. There are some monitoring wells listed in the Groundwater Monitoring Plan to evaluate leach fields however, they don't appear to be in close proximity to the leach fields. There appears to be existing monitoring wells closer to the leach fields that are not being proposed for testing. Please clarify.

Page 17: Commented [JH44]

Section 13.1, We are not able to verify that monitoring wells exist in the North Application Field by viewing Figure 3.13.-1 or the Monitoring Well Location Plan (Figure 2) in the H&A Groundwater Monitoring Plan. I recommend that groundwater monitoring wells or grab groundwater samples be collect from this area of the site, which could also be expanded and serve as upgradient/background locations. There appear to be adjacent offsite agricultural fields. Also, Table 1 of the Non-Rad HAS, RSCS, September 2014, indicated buried debris 3-16 feet. Please confirm if the buried debris was tested and removed and properly disposed of.

Page 18: Commented [JH45]

Section 3.15, Make sure soil samples are collected close enough to the creosote cooling tower supports (within a few feet) to evaluate leaching to shallow soils and groundwater.

Page 19: Commented [JH46]

3.16, unless grab groundwater samples will be collected downgradient of the cooling tower area and at the north end of the property we recommend monitoring wells be installed in these areas. There is little to no groundwater data in these areas of the property.

Page 48: Commented [JH47]

Table 3.0-4, See comments in text and rationale tables pertaining to inconsistent TPH testing at transformer locations. Also, please make sure number of samples in cited in Rationale tables matches number of samples in this summary table. Some discrepancy observed.

Page 51: Commented [JH48]

Table 2 in the Groundwater Monitoring Plan (Appendix C) does not include any PFAS/PFOA testing. Please clarify if PFAS/PFOA testing will be conducted on any of the existing monitoring wells.

Page 53: Commented [JH49]

Table 3.1-2, See comments in text section 3.1 pertaining to AOC1.

Page 54: Commented [JH50]

Table 3.1-2, Text section 3.1.2 states that testing for VOCs, TPH, and TAL metals will be included as well. Please clarify which testing analysis.

Page 54: Commented [JH51]

Table 3.1-2, See comment above about other analysis. TPH should also be considered analysis because of potential of dieletric fluid spills. Irule has TPH SSV. This comment applies to all transformer PCS.

Page 7: Commented [JH52]

Table 3.5-2, See comments in section 3.5.

Page 11: Commented [JH53]

Table 3.7-1, See comments/questions in Section 3.7.

Page 19: Commented [JH54]

Table 3.9-2, Table 3.0-4 indicates 4 samples to be collected; however, this table indicates 3 samples, please clarify.

Page 37: Commented [JH55]

Table 3.15-2, Recommend that groundwater grab samples be collected at DP1501, DP1502, DP1507 since there are no existing monitoring wells or groundwater data in this area of the site.

Page 1: Commented [JH56]

Appendix A-Below Grade Structure Survey WP, Building materials should also be sampled and analyzed for asbestos.

Page 10: Commented [JH57]

Appendix B-Borrow Materials Import Plan, VTDEC generally requires discrete samples vs composite samples. Will need approval from VTDEC for composite samples. Sample for VOC analysis should not be composited. Please provide specifics on sample collection procedures (sample collection depth, etc).

Please provide rationale for selected parameters? Should other parameters such as PCBs be included? VTDEC should approve if 1 sample per 1,000 CY is adequate.

Page 2: Commented [JH58]

Appendix C-Groundwater Monitoring Plan, 1.3 Recommend adding PFAS testing to a few existing monitoring wells in the area of the former dry cleaner and where AFFF was used on transformers. We also recommend VOC and PFAS testing of the three bedrock supply wells (West Well, NEOB Well, Southwest Well). The West Well and NEOB Well were last sampled (for VOCs) in 2001. We understand 2 PFAS grab GW samples are proposed in the transformer AOC where AFFF was used but think more PFAS sampling is warranted. Also, recommend PFAS testing in any location where AFFF was stored.

Page 2: Commented [JH59]

Appendix C-Groundwater Monitoring Plan, 1.3 Please provide description on how grab sample will be collected.

Page 2: Commented [JH60]

Appendix C-Groundwater Monitoring Plan, 1.3 See previous note regarding adding groundwater sampling downgradient of cooling towers (AOC 15) and in northern end of site (North Field Application Area) where no soil or groundwater data exists.

Page 2: Commented [JH61]

Appendix C-Groundwater Monitoring Plan, Appendix C, Please elaborate on what is meant by if "impacts" are identified. Is an impact a result of a VGES exceedance?

Page 5: Commented [JH62]

Appendix C-Groundwater Monitoring Plan, 3.3.2 PFAS not listed in attached Table 2. We recommend adding a few wells in the former dry cleaner area and in a few wells downgradient ,of the transformer fires where AFFF was used as well as any areas where AFFF was stored onsite.

Page 13: Commented [JH63]

Appendix D- Concrete Reuse Plan, Concrete Characterization. Concrete and any paints or coating should also be sampled and analyzed for asbestos.

Also, regarding the H&A Draft Voluntary Corrective Action Plan (CAP), Rev C, November 2017, this document does not follow the IRule CAP or ECCA requirements. Will the VTDEC waive IRule requirements for these two documents?

Please contact us with any questions related to the comments above.

Sincerely,

ATC GROUP SERVICES, LLC.

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March 21, 2019

Mr. Gerold Noyes, PE
Department of Environmental Conservation
Sites Management Section
1 National Life Drive – Davis 1
Montpelier, VT 05602-3704

Transmitted via electronic mail to: Gerold.noyes@vermont.gov

RE: Vermont Yankee Nuclear Power Station
Quality Assurance Project Plan, Rev. E Document Review

Dear Gerold,

The Vermont DEC has retained ATC Group Services, LLC (ATC) to provide expertise and consultation on the remediation and restoration of the Vermont Yankee Nuclear Power Station (VYNPS) in Vernon, Vermont (Contract #37779). The following letter report is provided in response to your request for ATC to perform document reviews related to the above referenced project.

Scope of Work

This report documents the ATC review of the following document:

- Quality Assurance Project Plan, Rev. E, Characterization of Environmental Media Decontamination and Decommissioning Support, Vermont Yankee Nuclear Power Station, Vernon, Vermont, Haley&Aldrich, February 2019.

QAPP, Rev. E

1. Overall comment: ATC identified references to both the current Investigation and Remediation of Contaminated Properties Rule (IRule; July 2017) and the former Investigation and Remediation of Contaminated Properties Procedure (IROCPP; April 2012). Due to the similar names of the two documents, ATC recommends adding the "IRule" to the list of Acronyms and revising the appropriate references in the QAPP to clearly distinguish between the two.

2. Section 1, Target Parameter List: Suggestion to specify the extraction method that will be used for PCB analysis of non-aqueous samples (Page 1-5).

3. Section 1: PFAS compounds are listed on the Target Parameter List, but not included on Table 1 showing MDL and RL values.

4. Section 3, Precision: Please provide rationale or reference for the proposed acceptance criteria of 100% RPD for field duplicates in non-aqueous samples and 35% RPD in aqueous samples above EPA Region 1 criteria of 50% and 30%, respectively.

5. Section 3.2 Accuracy, Field Accuracy Objectives: It is unclear how many equipment blank samples are proposed when sampling with non-dedicated or non-disposable equipment. As described, one equipment blank will be collected for each type or non-dedicated sampling equipment used for the sampling effort (Page 3-2). Does this mean, for example, that one equipment blank sample will be collected from each non-dedicated and non-disposable item (i.e. water level meter, soil sample trowel, split spoon, submersible pump etc.) that will document proper decontamination on that item throughout the project work? Section 3.7 states that one equipment rinse blank will be collected per sampling event. Please clarify.

6. Section 6. Calibration Procedures and Frequency: Suggest adding low flow multi-meter calibration procedures and frequency here.

7. Section 7. Analytical Procedures: Is it H&A's intention that for any compound where the RL is not sufficiently low enough to achieve the applicable standard, concentrations will be reported to the MDL, which may result in data qualification (flag)?

8. Section 9. Data Reduction, Validation and Reporting, Page 9-3: What is the process for determining which 10% of laboratory deliverables will have Tier II validation performed?

9. Section 12.1 Field Measurements: Why are pH and specific conductance the only two low flow water quality parameters being evaluated for accuracy and precision?

10. Appendix B. Field Sampling Standard Operating Procedures. Please include operating procedures (OPs) for PFAS and building materials sampling in Appendix B, with a suggestion to also include existing OP3028 Investigation Derived Wastes (referenced in the Decontamination Procedures OP) and OP3011 Groundwater Sampling Procedure Using Geoprobe System (if applicable for water samples collected from boreholes) to Appendix B.

11. Appendix B. Field Sampling Standard Operating Procedures. EPA Region 1 has updated the Low Stress (low flow) Purging and Sampling Procedure for the Collection of Groundwater Samples from Monitoring Wells (September 19, 2017) and OP3012 should reflect the 2017 revisions.

Please contact us with any questions related to the comments provided above.

Sincerely,
ATC GROUP SERVICES LLC

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March 21, 2019

Mr. Gerold Noyes, PE
Department of Environmental Conservation
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1 National Life Drive – Davis 1
Montpelier, VT 05602-3704

Transmitted via electronic mail to: Gerold.noyes@vermont.gov

RE: Vermont Yankee Nuclear Power Station
Building Characterization Document Reviews

Dear Gerold,

The Vermont DEC has retained ATC to provide expertise and consultation on the remediation and restoration of the Vermont Yankee Nuclear Power Station (VYNPS) in Vernon, Vermont (Contract #37779). The following letter report is provided in response to your request for ATC Group Services, LLC (ATC) to perform document reviews related to the above referenced project.

Scope of Work

This report documents the ATC review of the following documents:

1. DRAFT Building Characterization Work Plan, Rev. B, Haley&Aldrich, November 2017 (Appendix C missing)
2. Limited Building Characterization Completion Report, Rev. C, Haley&Aldrich, February 2019

DRAFT Building Characterization Work Plan, Rev. B

This document provides a general outline of the buildings to be characterized at the site, scope of sampling, planned sampling activities, sample custody, scheduling and reporting. Appendix C – Asbestos Characterization Work Plan was not included with the document and ATC has been informed by the DEC that this document was never completed by Northstar.

The following specific comments are provided:

Page 2, Section 1.3 APPLICABLE CODES, STANDARDS AND GUIDELINES – there is no reference to Vermont Department of Health Regulations for Asbestos Control and Regulations for Lead Control. This comment is applicable throughout the document wherever Asbestos Containing Materials (ACM) and Lead Based Paint (LBP) are mentioned.

Page 4, Section 4. Assessment/Sampling Activities – The following suspect ACMs have not been indicated for sampling: paints, coatings, mastics, siding, drywall, grouts, mortars, fire doors, sheet flooring, transite

piping, electrical components, wire insulation, insulated blankets, thermal system insulation, concrete blocks or poured concrete for asbestos. Also no mention of testing mastics for PCBs. This comment applies to each of the individual Tables.

Page NS-VYNDC 0105967 – "Lead Brick" was specified in the Gate House 2 plans and this material should be indicated for testing and analysis for total metals and TCLP metals.

Limited Building Characterization Completion Report, Rev. C

This document provides the results of a "limited" building material sampling program. Appendix A of this document provides results of additional asbestos sampling conducted by Hillman Consulting, LLC.

The following specific comments are provided:

Documentation of Haley & Aldrich's company and staff licenses to conduct asbestos and lead paint sampling per the Vermont Regulations for Asbestos Control and the Vermont Regulations for Lead Control were not included in the report.

Although TCLP sampling of selected individual coatings have been collected, plans for complete waste stream characterization for Hazardous Waste was not addressed.

Page 2, Section 1.3 APPLICABLE CODES, STANDARDS AND GUIDELINES – there is no reference to Vermont Department of Health Regulations for Asbestos Control and Regulations for Lead Control. This comment is applicable throughout the document wherever ACM and LBP are mentioned.

Page 5, Section 4.1 PAINTS/COATINGS – states that 97 paint/coating samples were collected and analyzed for total metals, TCLP metals and PCBs. It is unclear as to whether or not this is considered a complete sampling of all of the different paints/coatings at the facility but it is likely that there are greater than 97 different paints and coatings present at the facility. In addition, all paints and coatings should also be analyzed for asbestos. Mastics and adhesives should be included in this category of materials. There are additional samples of mastics with analysis for asbestos only in Appendix A of this report.

Page 5, Section 4.2 CAULKING – states that 8 caulking samples were submitted for analysis for asbestos and PCBs. Based on the site walkthrough conducted by ATC on March 15, 2019, there are many more different caulk products present at the facility which should be sampled for asbestos and PCBs including caulks located in concrete expansion joints. There are additional samples of caulks with analysis for asbestos only in Appendix A of this report but that sampling is also not inclusive of all caulks present at the facility.

Page 5, Section 4.3 CONCRETE – all concrete should also be sampled for asbestos.

Page 5, Section 4.4 ROOFING – states that 4 roofing samples were collected and analyzed for asbestos and PCBs. Appendix A states that roofing was not included in the asbestos survey. There are many other roofing products present at the facility which should be sampled for asbestos and PCBs.

Page 5, Section 4.5 SIDING – states that 13 samples were collected and analyzed for asbestos and PCBs. Appendix A states that most exterior materials were excluded from the asbestos survey. There are many other exterior siding products present at the facility which should be sampled for asbestos and PCBs.

Appendix A provides a more complete asbestos survey. As stated in Appendix A, this inspection was conducted of accessible materials, with limited intrusive methods. Refer to Appendix A, page 4, Section 2.5 for a description of areas which were not sampled. These areas, including exterior materials, roofing and wall cavities, are required to be inspected prior to building renovations or demolition. Particular attention should be paid to the possibility of vermiculite fill in block walls.

General Comments

Based on both the Feb 28, 2019 Kickoff Meeting and March 15, 2019 Site Meeting, Northstar and it's consultant, Haley & Aldrich have acknowledged that the building characterizations have not been completed. They have stated that further sampling will be conducted and that the results of the different sampling events will be compiled into a single report for each building to be submitted to the Vermont DEC and the Vermont Department of Health program prior to initiating building demolition.

ATC has not seen any documentation of sampling of containerized chemicals and/or residues present in AST, UST or other containers.

Based on a review of the documents and our on site walkthrough, the following suspect PCB and/or ACM appear not to have been sampled in all locations present:

Paints and coatings
Concrete
Mastics and adhesives
Fire doors
Transite piping including potential subsurface locations
Potential vermiculite fill in block walls and ceilings
Grouts and mortars
Wire coatings and insulation
Electrical equipment
Expansion joint and other caulks

After building characterization is complete and the compiled final report for specific buildings are submitted, the DEC should consider conducting on site field verification to determine if the building characterizations are accurate and complete. This on site verification could determine, on a material by material basis, that suspect building materials present have been tested for asbestos, metals and PCBs.

Sincerely,

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From:	Glucksberg, Nadia
To:	Noyes, Gerold; Fekert, Dennis; Gonda, Jordan; Simoes, Steve; Irwin, William; Kinnick, Christopher; Schwer, Chuck
Cc:	Daniels, Corey; Langub, Nelson; Reid, Billy; van Noordennen, Miles; Danaher, Elida
Bcc:	Kingston, Jennifer L.; Self, Luke
Subject:	NorthStar Vermont Yankee D&D Schedule for 2019
Date:	Thursday, April 18, 2019 5:36:00 PM
Attachments:	2019 NNDC Vermont Yankee Draft Schedule 4-18-2019.pdf

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Good Evening Gerold

As discussed last week and as required by our MOU, attached is the current schedule for the NorthStar Vermont Yankee D&D project. Because long term schedules are still being developed, we have extended the schedule through 2019 for your review and will provide the full schedule once it has been vetted. Please know that this schedule is subject to change and if there are significant changes, we will provide updates.

As always, please let us know if you have any questions or would like clarification/details on specific items.

Thank you.

Nadia

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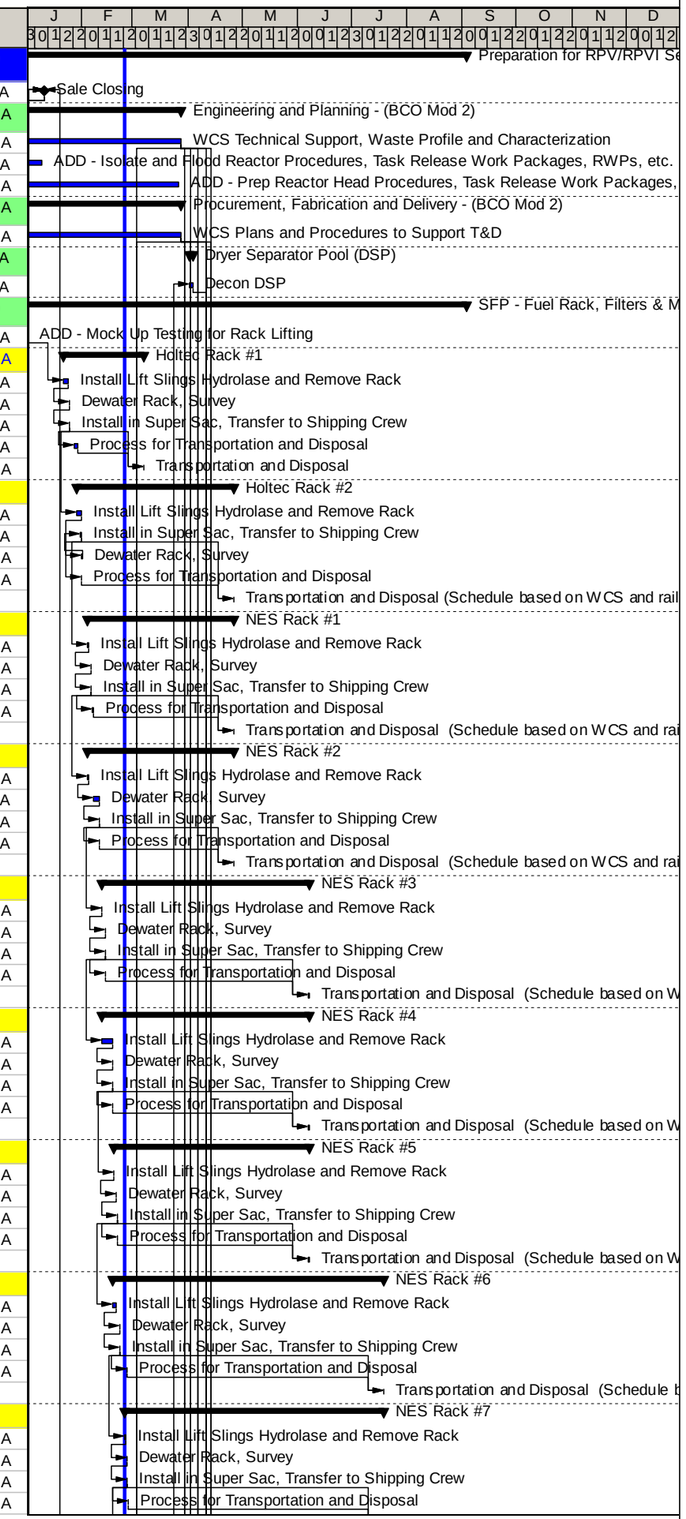
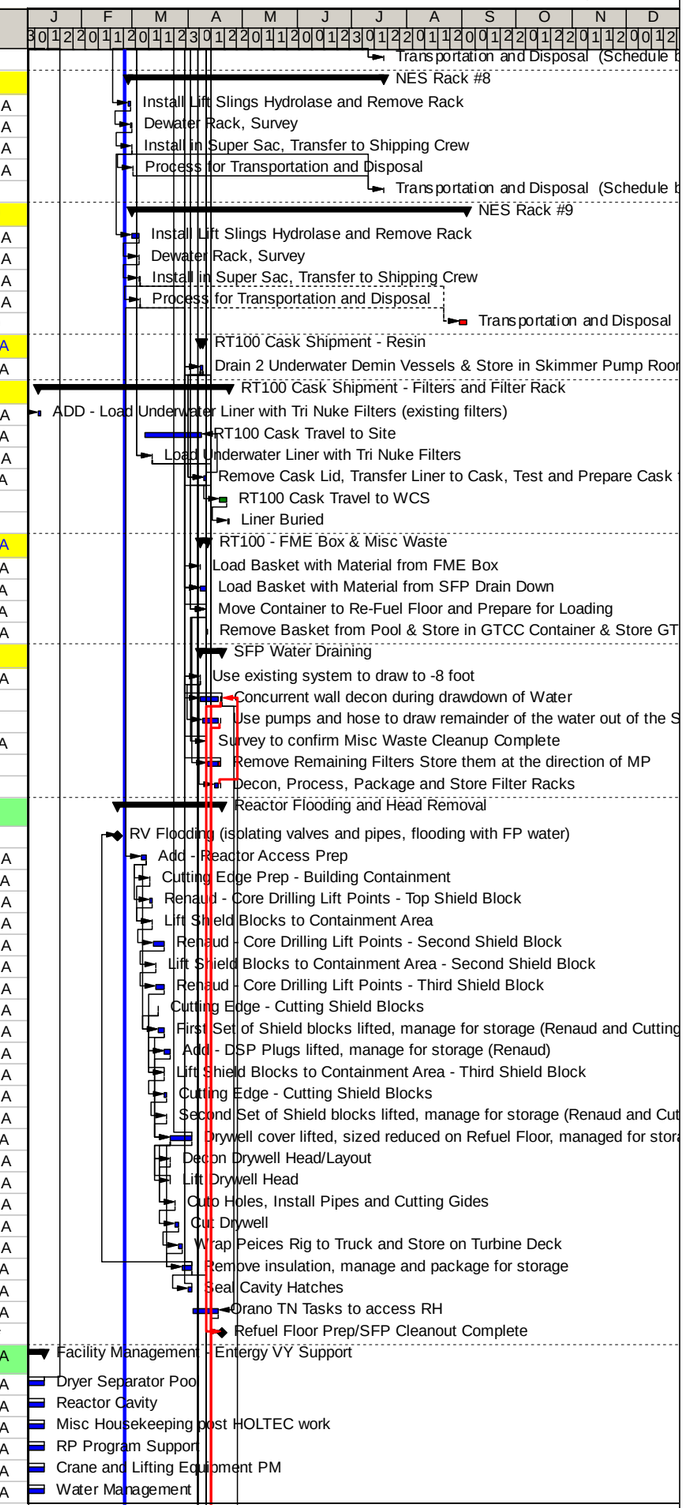
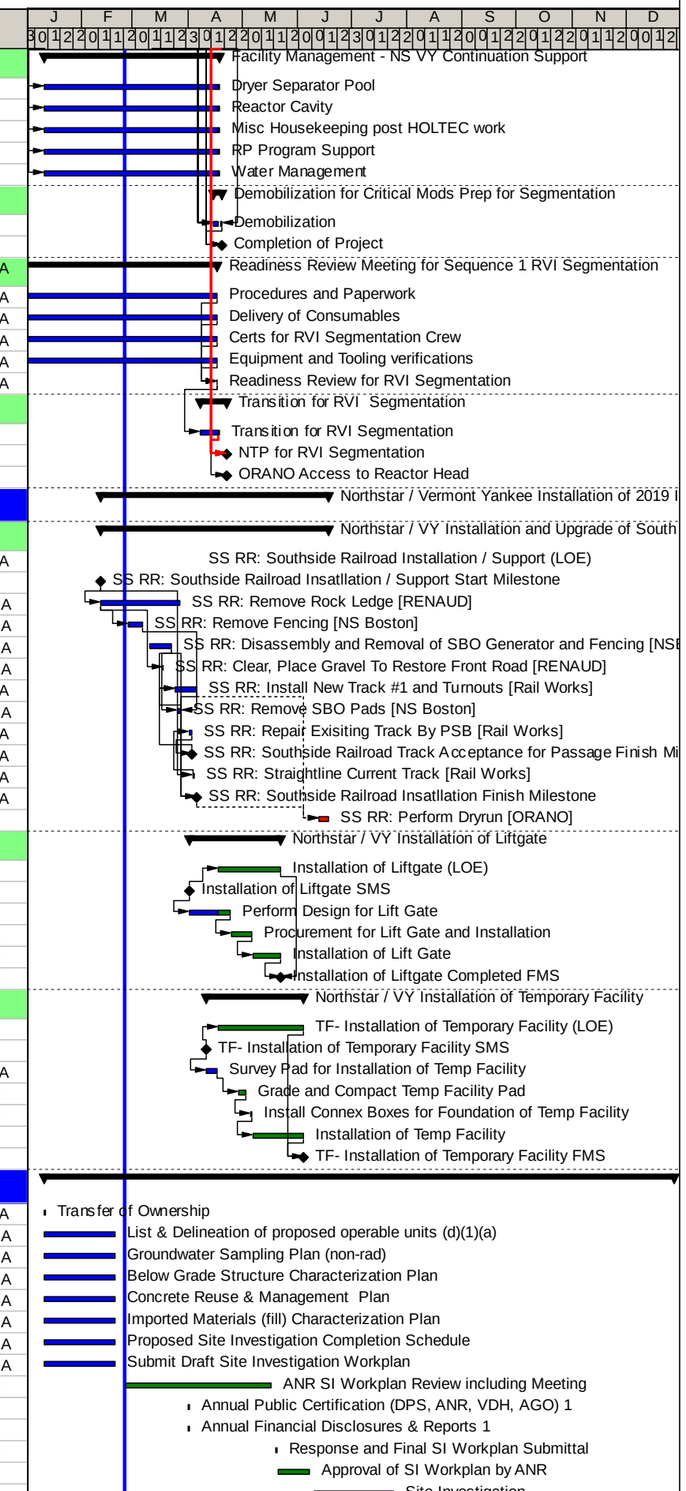
#	Activity ID	Activity Name	OD	Rem Dur	% Comp	Start	Finish
1	**Preparation for RPV/RPVI Segmentation 4-18-2019 Update**		269.3	96.0		10-Aug-18 A	03-Sep-19
2	A1810	Sale Closing	0.0	0.0	100%		11-Jan-19 A
3	**Engineering and Planning - (BCO Mod 2)**		25.0	0.0		24-Sep-18 A	28-Mar-19 A
4	A2430	WCS Technical Support, Waste Profile and Characterization	25.0	0.0	100%	24-Sep-18 A	28-Mar-19 A
5	A2470	ADD - Isolate and Flood Reactor Procedures, Task Release Work Packages, RWPs, etc.	18.0	0.0	100%	08-Oct-18 A	10-Jan-19 A
6	A2480	ADD - Prep Reactor Head Procedures, Task Release Work Packages, RWPs, etc.	18.0	0.0	100%	27-Nov-18 A	26-Mar-19 A
7	**Procurement, Fabrication and Delivery - (BCO Mod 2)**		25.0	0.0		20-Sep-18 A	28-Mar-19 A
8	A1890	WCS Plans and Procedures to Support T&D	25.0	0.0	100%	20-Sep-18 A	28-Mar-19 A
9	**Dryer Separator Pool (DSP)**		1.0	0.0		02-Apr-19 A	04-Apr-19 A
10	A2090	Decon DSP	1.0	0.0	100%	02-Apr-19 A	04-Apr-19 A
11	**SFP - Fuel Rack, Filters & Misc Waste**		178.3	96.0		19-Dec-18 A	03-Sep-19
12	A2380	ADD - Mock Up Testing for Rack Lifting	5.0	0.0	100%	19-Dec-18 A	02-Jan-19 A
13	**Holtec Rack #1**		30.8	0.0		22-Jan-19 A	07-Mar-19 A
14	A1140	Install Lift Slings Hydrolase and Remove Rack	0.8	0.0	100%	22-Jan-19 A	24-Jan-19 A
15	A1150	Dewater Rack, Survey	0.2	0.0	100%	25-Jan-19 A	25-Jan-19 A
16	A1160	Install in Super Sac, Transfer to Shipping Crew	0.6	0.0	100%	25-Jan-19 A	25-Jan-19 A
17	A2270	Process for Transportation and Disposal	0.3	0.0	100%	28-Jan-19 A	30-Jan-19 A
18	A1170	Transportation and Disposal	0.5	0.0	100%	07-Mar-19 A	07-Mar-19 A
19	**Holtec Rack #2**		61.8	0.5		29-Jan-19 A	26-Apr-19
20	A1180	Install Lift Slings Hydrolase and Remove Rack	0.8	0.0	100%	29-Jan-19 A	31-Jan-19 A
21	A1200	Install in Super Sac, Transfer to Shipping Crew	0.6	0.0	100%	31-Jan-19 A	31-Jan-19 A
22	A1190	Dewater Rack, Survey	0.2	0.0	100%	31-Jan-19 A	01-Feb-19 A
23	A2280	Process for Transportation and Disposal	0.2	0.0	100%	01-Feb-19 A	01-Feb-19 A
24	A1210	Transportation and Disposal (Schedule based on WCS and rail available)	0.5	0.5	0%	26-Apr-19*	26-Apr-19
25	**NES Rack #1**		56.8	0.5		04-Feb-19 A	26-Apr-19
26	A1220	Install Lift Slings Hydrolase and Remove Rack	0.4	0.0	100%	04-Feb-19 A	05-Feb-19 A
27	A1230	Dewater Rack, Survey	0.1	0.0	100%	06-Feb-19 A	06-Feb-19 A
28	A1240	Install in Super Sac, Transfer to Shipping Crew	0.3	0.0	100%	06-Feb-19 A	06-Feb-19 A
29	A2290	Process for Transportation and Disposal	0.2	0.0	100%	07-Feb-19 A	07-Feb-19 A
30	A1250	Transportation and Disposal (Schedule based on WCS and rail available)	0.5	0.5	0%	26-Apr-19*	26-Apr-19
31	**NES Rack #2**		56.8	0.5		04-Feb-19 A	26-Apr-19
32	A1260	Install Lift Slings Hydrolase and Remove Rack	0.4	0.0	100%	04-Feb-19 A	05-Feb-19 A
33	A1270	Dewater Rack, Survey	0.1	0.0	100%	07-Feb-19 A	11-Feb-19 A
34	A1280	Install in Super Sac, Transfer to Shipping Crew	0.3	0.0	100%	11-Feb-19 A	11-Feb-19 A
35	A2300	Process for Transportation and Disposal	0.2	0.0	100%	11-Feb-19 A	11-Feb-19 A
36	A1290	Transportation and Disposal (Schedule based on WCS and rail available)	0.5	0.5	0%	26-Apr-19*	26-Apr-19
37	**NES Rack #3**		79.8	0.5		12-Feb-19 A	07-Jun-19
38	A1300	Install Lift Slings Hydrolase and Remove Rack	0.4	0.0	100%	12-Feb-19 A	12-Feb-19 A
39	A1310	Dewater Rack, Survey	0.1	0.0	100%	14-Feb-19 A	14-Feb-19 A
40	A1320	Install in Super Sac, Transfer to Shipping Crew	0.3	0.0	100%	14-Feb-19 A	14-Feb-19 A
41	A2310	Process for Transportation and Disposal	0.2	0.0	100%	14-Feb-19 A	14-Feb-19 A
42	A1330	Transportation and Disposal (Schedule based on WCS and rail available)	0.5	0.5	0%	07-Jun-19*	07-Jun-19
43	**NES Rack #4**		79.8	0.5		12-Feb-19 A	07-Jun-19
44	A1340	Install Lift Slings Hydrolase and Remove Rack	0.4	0.0	100%	12-Feb-19 A	18-Feb-19 A
45	A1350	Dewater Rack, Survey	0.1	0.0	100%	18-Feb-19 A	18-Feb-19 A
46	A1360	Install in Super Sac, Transfer to Shipping Crew	0.3	0.0	100%	18-Feb-19 A	18-Feb-19 A
47	A2320	Process for Transportation and Disposal	0.2	0.0	100%	18-Feb-19 A	18-Feb-19 A
48	A1370	Transportation and Disposal (Schedule based on WCS and rail available)	0.5	0.5	0%	07-Jun-19*	07-Jun-19
49	**NES Rack #5**		74.5	0.5		19-Feb-19 A	07-Jun-19
50	A1380	Install Lift Slings Hydrolase and Remove Rack	0.4	0.0	100%	19-Feb-19 A	19-Feb-19 A
51	A1390	Dewater Rack, Survey	0.1	0.0	100%	20-Feb-19 A	20-Feb-19 A
52	A1400	Install in Super Sac, Transfer to Shipping Crew	0.3	0.0	100%	21-Feb-19 A	21-Feb-19 A
53	A2330	Process for Transportation and Disposal	0.2	0.0	100%	21-Feb-19 A	21-Feb-19 A
54	A1410	Transportation and Disposal (Schedule based on WCS and rail available)	0.5	0.5	0%	07-Jun-19*	07-Jun-19
55	**NES Rack #6**		103.5	0.5		18-Feb-19 A	19-Jul-19
56	A1420	Install Lift Slings Hydrolase and Remove Rack	0.4	0.0	100%	18-Feb-19 A	20-Feb-19 A
57	A1430	Dewater Rack, Survey	0.1	0.0	100%	22-Feb-19 A	22-Feb-19 A
58	A1440	Install in Super Sac, Transfer to Shipping Crew	0.3	0.0	100%	22-Feb-19 A	22-Feb-19 A
59	A2340	Process for Transportation and Disposal	0.2	0.0	100%	25-Feb-19 A	26-Feb-19 A
60	A1450	Transportation and Disposal (Schedule based on WCS and rail available)	0.5	0.5	0%	19-Jul-19*	19-Jul-19
61	**NES Rack #7**		103.5	0.5		25-Feb-19 A	19-Jul-19
62	A1460	Install Lift Slings Hydrolase and Remove Rack	0.4	0.0	100%	25-Feb-19 A	25-Feb-19 A
63	A1470	Dewater Rack, Survey	0.1	0.0	100%	26-Feb-19 A	26-Feb-19 A
64	A1480	Install in Super Sac, Transfer to Shipping Crew	0.3	0.0	100%	26-Feb-19 A	26-Feb-19 A
65	A2350	Process for Transportation and Disposal	0.2	0.0	100%	27-Feb-19 A	27-Feb-19 A



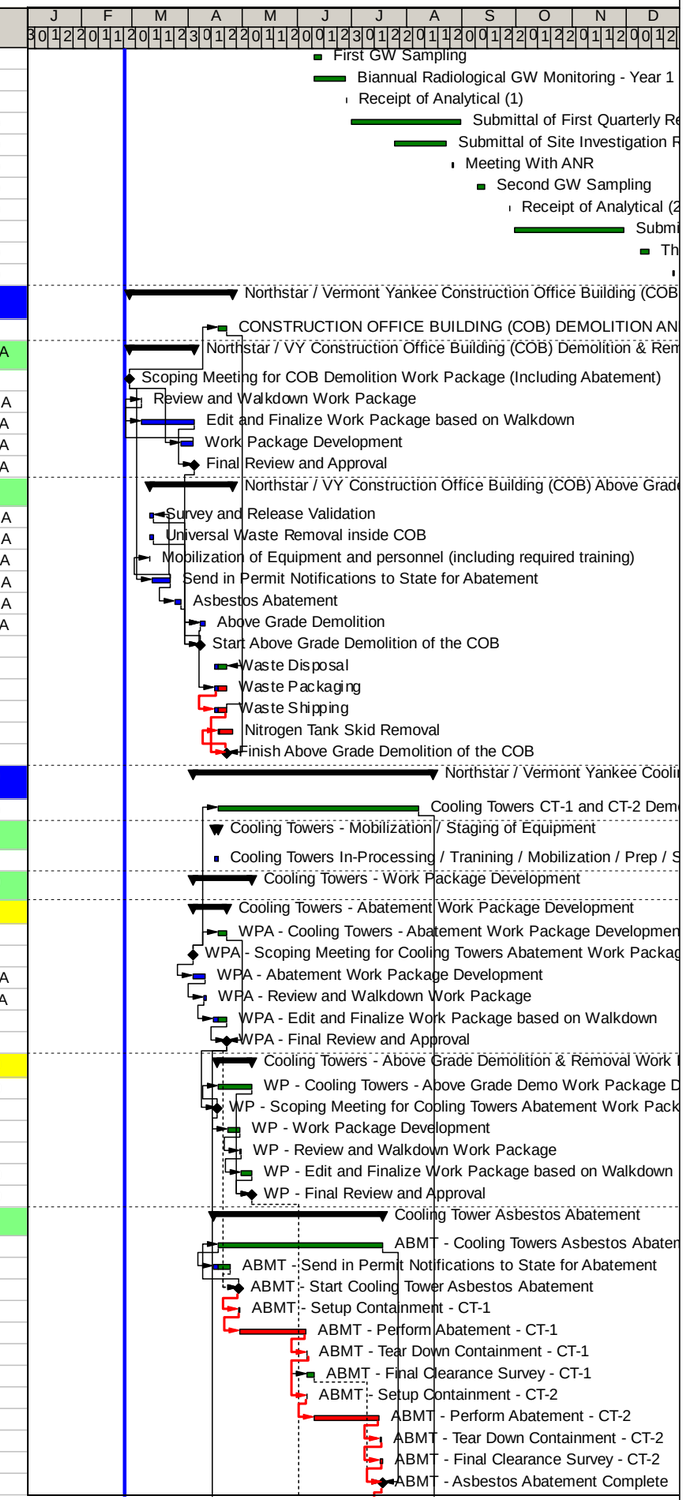
#	Activity ID	Activity Name	OD	Rem Dur	% Comp	Start	Finish
66	A1490	Transportation and Disposal (Schedule based on WCS and rail available)	0.5	0.5	0%	19-Jul-19*	19-Jul-19
67	**NES Rack #8**		103.5	0.5		27-Feb-19 A	19-Jul-19
68	A1500	Install Lift Slings Hydrolase and Remove Rack	0.4	0.0	100%	27-Feb-19 A	28-Feb-19 A
69	A1510	Dewater Rack, Survey	0.1	0.0	100%	28-Feb-19 A	28-Feb-19 A
70	A1520	Install in Super Sac, Transfer to Shipping Crew	0.3	0.0	100%	28-Feb-19 A	28-Feb-19 A
71	A2360	Process for Transportation and Disposal	0.2	0.0	100%	01-Mar-19 A	01-Mar-19 A
72	A1530	Transportation and Disposal (Schedule based on WCS and rail available)	0.5	0.5	0%	19-Jul-19*	19-Jul-19
73	**NES Rack #9**		130.0	2.0		01-Mar-19 A	03-Sep-19
74	A1540	Install Lift Slings Hydrolase and Remove Rack	1.0	0.0	100%	01-Mar-19 A	05-Mar-19 A
75	A1550	Dewater Rack, Survey	0.1	0.0	100%	05-Mar-19 A	05-Mar-19 A
76	A1560	Install in Super Sac, Transfer to Shipping Crew	0.3	0.0	100%	05-Mar-19 A	05-Mar-19 A
77	A2370	Process for Transportation and Disposal	0.2	0.0	100%	05-Mar-19 A	05-Mar-19 A
78	A1570	Transportation and Disposal (Schedule based on WCS and rail available)	2.0	2.0	0%	30-Aug-19*	03-Sep-19
79	**RT100 Cask Shipment - Resin**		1.0	0.0		08-Apr-19 A	09-Apr-19 A
80	A1610	Drain 2 Underwater Demin Vessels & Store in Skimmer Pump Room	1.0	0.0	100%	08-Apr-19 A	09-Apr-19 A
81	**RT100 Cask Shipment - Filters and Filter Rack**		73.3	4.0		08-Jan-19 A	23-Apr-19
82	A2510	ADD - Load Underwater Liner with Tri Nuke Filters (existing filters)	2.4	0.0	100%	08-Jan-19 A	09-Jan-19 A
83	A1660	RT100 Cask Travel to Site	2.0	0.0	100%	08-Mar-19 A	08-Apr-19 A
84	A1680	Load Underwater Liner with Tri Nuke Filters	1.0	0.0	100%	12-Mar-19 A	12-Mar-19 A
85	A1690	Remove Cask Lid, Transfer Liner to Cask, Test and Prepare Cask for Shipment	0.5	0.0	100%	10-Apr-19 A	11-Apr-19 A
86	A1710	RT100 Cask Travel to WCS	3.0	3.0	0%	18-Apr-19*	22-Apr-19
87	A1720	Liner Buried	1.0	1.0	0%	23-Apr-19	23-Apr-19
88	**RT100 - FME Box & Misc Waste**		3.5	0.0		08-Apr-19 A	12-Apr-19 A
89	A1760	Load Basket with Material from FME Box	0.5	0.0	100%	08-Apr-19 A	08-Apr-19 A
90	A2450	Load Basket with Material from SFP Drain Down	0.5	0.0	100%	08-Apr-19 A	11-Apr-19 A
91	A1750	Move Container to Re-Fuel Floor and Prepare for Loading	0.2	0.0	100%	11-Apr-19 A	11-Apr-19 A
92	A1770	Remove Basket from Pool & Store in GTCC Container & Store GTCC Container	0.3	0.0	100%	11-Apr-19 A	12-Apr-19 A
93	**SFP Water Draining**		4.7	1.7		08-Apr-19 A	19-Apr-19
94	A2160	Use existing system to draw to -8 foot	0.3	0.0	100%	08-Apr-19 A	08-Apr-19 A
95	A2180	Concurrent wall decon during drawdown of Water	2.0	0.7	70%	08-Apr-19 A	19-Apr-19
96	A2170	Use pumps and hose to draw remainder of the water out of the SFP	0.7	0.0	70%	09-Apr-19 A	19-Apr-19
97	A2390	Survey to confirm Misc Waste Cleanup Complete	0.3	0.0	100%	11-Apr-19 A	11-Apr-19 A
98	A2600	Remove Remaining Filters Store them at the direction of MP	1.0	1.0	75%	12-Apr-19 A	19-Apr-19
99	A1700	Decon, Process, Package and Store Filter Racks	0.3	0.3	75%	16-Apr-19 A	19-Apr-19
100	**Reactor Flooding and Head Removal**		36.0	0.0		21-Feb-19 A	19-Apr-19
101	A2130	RV Flooding (isolating valves and pipes, flooding with FP water)	0.0	0.0	100%	21-Feb-19 A	
102	A2400	Add - Reactor Access Prep	3.5	0.0	100%	06-Mar-19 A	09-Mar-19 A
103	A2530	Cutting Edge Prep - Building Containment	0.5	0.0	100%	11-Mar-19 A	11-Mar-19 A
104	A2540	Renaud - Core Drilling Lift Points - Top Shield Block	3.0	0.0	100%	11-Mar-19 A	12-Mar-19 A
105	A2550	Lift Shield Blocks to Containment Area	0.1	0.0	100%	12-Mar-19 A	12-Mar-19 A
106	A2555	Renaud - Core Drilling Lift Points - Second Shield Block	0.5	0.0	100%	13-Mar-19 A	19-Mar-19 A
107	A2560	Lift Shield Blocks to Containment Area - Second Shield Block	0.1	0.0	100%	14-Mar-19 A	14-Mar-19 A
108	A2565	Renaud - Core Drilling Lift Points - Third Shield Block	3.0	0.0	100%	14-Mar-19 A	19-Mar-19 A
109	A2580	Cutting Edge - Cutting Shield Blocks	0.5	0.0	100%	15-Mar-19 A	15-Mar-19 A
110	A2100	First Set of Shield blocks lifted, manage for storage (Renaud and Cutting Edge)	1.0	0.0	100%	15-Mar-19 A	19-Mar-19 A
111	A2520	Add - DSP Plugs lifted, manage for storage (Renaud)	3.0	0.0	100%	19-Mar-19 A	22-Mar-19 A
112	A2570	Lift Shield Blocks to Containment Area - Third Shield Block	0.1	0.0	100%	19-Mar-19 A	19-Mar-19 A
113	A2590	Cutting Edge - Cutting Shield Blocks	1.0	0.0	100%	19-Mar-19 A	20-Mar-19 A
114	A2585	Second Set of Shield blocks lifted, manage for storage (Renaud and Cutting Edge)	1.0	0.0	100%	20-Mar-19 A	20-Mar-19 A
115	A2110	Drywell cover lifted, sized reduced on Refuel Floor, managed for storage (Renaud and Cutting Edge)	6.0	0.0	100%	22-Mar-19 A	03-Apr-19 A
116	A2610	Decon Drywell Head/Layout	1.0	0.0	100%	22-Mar-19 A	22-Mar-19 A
117	A2650	Lift Drywell Head	1.0	0.0	100%	22-Mar-19 A	22-Mar-19 A
118	A2620	Cuto Holes, Install Pipes and Cutting Gides	1.0	0.0	100%	25-Mar-19 A	25-Mar-19 A
119	A2630	Cut Drywell	3.0	0.0	100%	25-Mar-19 A	27-Mar-19 A
120	A2640	Wrap Peices Rig to Truck and Store on Turbine Deck	1.0	0.0	100%	27-Mar-19 A	29-Mar-19 A
121	A2120	Remove insulation, manage and package for storage	1.0	0.0	100%	29-Mar-19 A	03-Apr-19 A
122	A2720	Seal Cavity Hatches	1.0	0.0	100%	01-Apr-19 A	03-Apr-19 A
123	A2140	Orano TN Tasks to access RH	4.0	0.0	100%	04-Apr-19 A	18-Apr-19 A
124	A1580	Refuel Floor Prep/SFP Cleanout Complete	0.0	0.0	0%		19-Apr-19*
125	**Facility Management - Entergy VY Support**		69.6	0.0		13-Aug-18 A	11-Jan-19 A
126	A1900	Dryer Separator Pool	69.6	0.0	100%	13-Aug-18 A	11-Jan-19 A
127	A1910	Reactor Cavity	69.6	0.0	100%	13-Aug-18 A	11-Jan-19 A
128	A1920	Misc Housekeeping post HOLTEC work	69.6	0.0	100%	13-Aug-18 A	11-Jan-19 A
129	A1930	RP Program Support	69.6	0.0	100%	13-Aug-18 A	11-Jan-19 A
130	A1940	Crane and Lifting Equipment PM	69.6	0.0	100%	13-Aug-18 A	11-Jan-19 A
131	A1950	Water Management	69.6	0.0	100%	13-Aug-18 A	11-Jan-19 A



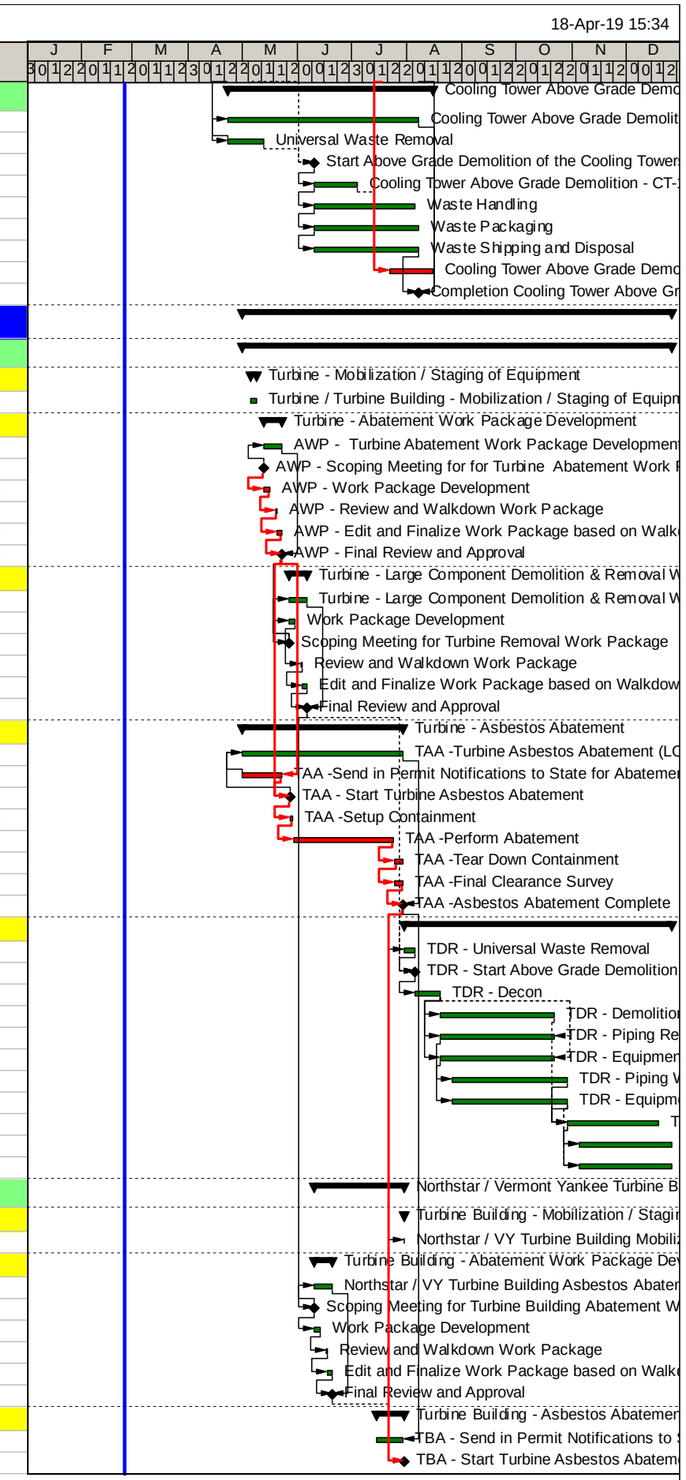
#	Activity ID	Activity Name	OD	Rem Dur	% Comp	Start	Finish
132	**Facility Management - NS VY Continuation Support**		26.0	1.0		11-Jan-19 A	18-Apr-19
133	A1960	Dryer Separator Pool	26.0	1.0	90%	11-Jan-19 A	18-Apr-19
134	A1970	Reactor Cavity	26.0	1.0	90%	11-Jan-19 A	18-Apr-19
135	A1980	Misc Housekeeping post HOLTEC work	26.0	1.0	90%	11-Jan-19 A	18-Apr-19
136	A1990	RP Program Support	26.0	1.0	90%	11-Jan-19 A	18-Apr-19
137	A2000	Water Management	26.0	1.0	90%	11-Jan-19 A	18-Apr-19
138	**Demobilization for Critical Mods Prep for Segmentation**		5.0	0.5		15-Apr-19 A	19-Apr-19
139	A2420	Demobilization	5.0	0.5	90%	15-Apr-19 A	19-Apr-19
140	A2410	Completion of Project	0.0	0.0	0%		19-Apr-19
141	**Readiness Review Meeting for Sequence 1 RVI Segmentation**		178.3	0.0		10-Aug-18 A	17-Apr-19 A
142	A2190	Procedures and Paperwork	85.0	0.0	100%	10-Aug-18 A	17-Apr-19 A
143	A2210	Delivery of Consumables	85.0	0.0	100%	10-Aug-18 A	17-Apr-19 A
144	A2220	Certs for RVI Segmentation Crew	85.0	0.0	100%	10-Aug-18 A	17-Apr-19 A
145	A2200	Equipment and Tooling verifications	85.0	0.0	100%	10-Aug-18 A	17-Apr-19 A
146	A2230	Readiness Review for RVI Segmentation	5.0	0.0	100%	17-Apr-19 A	17-Apr-19 A
147	**Transition for RVI Segmentation**		8.0	2.0		08-Apr-19 A	22-Apr-19
148	A2240	Transition for RVI Segmentation	8.0	0.0	0%	08-Apr-19 A	18-Apr-19
149	A1040	NTP for RVI Segmentation	0.0	0.0	0%	22-Apr-19*	
150	A2260	ORANO Access to Reactor Head	0.0	0.0	0%	22-Apr-19	
151	**Northstar / Vermont Yankee Installation of 2019 Infrastructure and Upgrades April 18 Update**		92.0	44.0		11-Feb-19 A	18-Jun-19
152	**Northstar / VY Installation and Upgrade of South Side Railroad Tracks**		92.0	4.0		11-Feb-19 A	18-Jun-19
153	VY-RR-LOE	SS RR: Southside Railroad Installation / Support (LOE)	65.0	0.0	100%	11-Feb-19 A	06-Apr-19 A
154	VY-RR-SMS	SS RR: Southside Railroad Insatllation / Support Start Milestone	0.0	0.0	100%	11-Feb-19 A	
155	VY-RR-001	SS RR: Remove Rock Ledge [RENAUD]	14.0	0.0	100%	11-Feb-19 A	27-Mar-19 A
156	VY-RR-005	SS RR: Remove Fencing [NS Boston]	7.0	0.0	100%	27-Feb-19 A	07-Mar-19 A
157	VY-RR-020	SS RR: Disassembly and Removal of SBO Generator and Fencing [NSB]	8.0	0.0	100%	11-Mar-19 A	22-Mar-19 A
158	VY-RR-010	SS RR: Clear, Place Gravel To Restore Front Road [RENAUD]	1.0	0.0	100%	18-Mar-19 A	18-Mar-19 A
159	VY-RR-030	SS RR: Install New Track #1 and Turnouts [Rail Works]	16.0	0.0	100%	25-Mar-19 A	06-Apr-19 A
160	VY-RR-015	SS RR: Remove SBO Pads [NS Boston]	3.0	0.0	100%	26-Mar-19 A	28-Mar-19 A
161	VY-RR-040	SS RR: Repair Exisiting Track By PSB [Rail Works]	2.0	0.0	100%	02-Apr-19 A	03-Apr-19 A
162	VY-RR-FMS5	SS RR: Southside Railroad Track Acceptance for Passage Finish Milestone	0.0	0.0	100%		03-Apr-19 A
163	VY-RR-025	SS RR: Straightline Current Track [Rail Works]	1.0	0.0	100%	04-Apr-19 A	04-Apr-19 A
164	VY-RR-FMS	SS RR: Southside Railroad Insatllation Finish Milestone	0.0	0.0	100%		06-Apr-19 A
165	VY-RR-035	SS RR: Perform Dryrun [ORANO]	4.0	4.0	0%	13-Jun-19*	18-Jun-19
166	**Northstar / VY Installation of Liftgate**		35.0	25.0		02-Apr-19 A	22-May-19
167	VY-LG-LOE	Installation of Liftgate (LOE)	30.0	25.0	0%	02-Apr-19 A	22-May-19
168	VY-LG--SMS	Installation of Liftgate SMS	0.0	0.0	100%	02-Apr-19 A	
169	VY-LG-005	Perform Design for Lift Gate	10.0	5.0	50%	02-Apr-19 A	24-Apr-19
170	VY-LG-010	Procurement for Lift Gate and Installation	8.0	8.0	0%	25-Apr-19	06-May-19
171	VY-LG-015	Installation of Lift Gate	12.0	12.0	0%	07-May-19	22-May-19
172	VY-LG-FMS	Installation of Liftgate Completed FMS	0.0	0.0	0%		22-May-19
173	**Northstar / VY Installation of Temporary Facility**		39.0	34.0		11-Apr-19 A	04-Jun-19
174	VY-TF-LOE	TF- Installation of Temporary Facility (LOE)	33.0	34.0	0%	11-Apr-19 A	04-Jun-19
175	VY-TF--SMS	TF- Installation of Temporary Facility SMS	0.0	0.0	100%	11-Apr-19 A	
176	VY-TF-005	Survey Pad for Installation of Temp Facility	5.0	0.0	100%	11-Apr-19 A	17-Apr-19 A
177	VY-TF-010	Grade and Compact Temp Facility Pad	5.0	5.0	0%	29-Apr-19*	03-May-19
178	VY-TF-015	Install Connex Boxes for Foundation of Temp Facility	1.0	1.0	0%	06-May-19	06-May-19
179	VY-TF-020	Installation of Temp Facility	21.0	21.0	0%	07-May-19*	04-Jun-19
180	VY-TF-FMS	TF- Installation of Temporary Facility FMS	0.0	0.0	0%		04-Jun-19
181	**Northstar / Vermont Yankee 2019-2015 HAI MOU**		250.8	220.0		11-Jan-19 A	27-Dec-19
182	MOU-0	Transfer of Ownership	0.8	0.0	100%	11-Jan-19 A	11-Jan-19 A
183	MOU-5	List & Delineation of proposed operable units (d)(1)(a)	40.0	0.0	100%	11-Jan-19 A	19-Feb-19 A
184	MOU-10	Groundwater Sampling Plan (non-rad)	40.0	0.0	100%	11-Jan-19 A	19-Feb-19 A
185	MOU-15	Below Grade Structure Characterization Plan	40.0	0.0	100%	11-Jan-19 A	19-Feb-19 A
186	MOU-20	Concrete Reuse & Management Plan	40.0	0.0	100%	11-Jan-19 A	19-Feb-19 A
187	MOU-25	Imported Materials (fill) Characterization Plan	40.0	0.0	100%	11-Jan-19 A	19-Feb-19 A
188	MOU-30	Proposed Site Investigation Completion Schedule	40.0	0.0	100%	11-Jan-19 A	19-Feb-19 A
189	MOU-35	Submit Draft Site Investigation Workplan	40.0	0.0	100%	11-Jan-19 A	19-Feb-19 A
190	MOU-40	ANR SI Workplan Review including Meeting	59.8	59.8	0%	25-Feb-19	17-May-19
191	MOU-75	Annual Public Certification (DPS, ANR, VDH, AGO) 1	0.8	0.8	0%	01-Apr-19*	01-Apr-19
192	MOU-185	Annual Financial Disclosures & Reports 1	0.8	0.8	0%	01-Apr-19*	01-Apr-19
193	MOU-45	Response and Final SI Workplan Submittal	1.0	1.0	0%	20-May-19*	20-May-19
194	MOU-50	Approval of SI Workplan by ANR	14.0	14.0	0%	21-May-19*	07-Jun-19
195	MOU-55	Site Investigation	33.0	33.0	0%	10-Jun-19*	24-Jul-19



#	Activity ID	Activity Name	OD	Rem Dur	% Comp	Start	Finish
196	MOU-95	First GW Sampling	5.0	5.0	0%	10-Jun-19*	14-Jun-19
197	MOU-165	Biannual Radiological GW Monitoring - Year 1	14.0	14.0	0%	10-Jun-19*	27-Jun-19
198	MOU-100	Receipt of Analytical (1)	1.0	1.0	0%	28-Jun-19*	28-Jun-19
199	MOU-105	Submittal of First Quarterly Report	45.0	45.0	0%	01-Jul-19*	30-Aug-19
200	MOU-60	Submittal of Site Investigation Report per MOU	21.0	21.0	0%	25-Jul-19*	22-Aug-19
201	MOU-65	Meeting With ANR	1.0	1.0	0%	26-Aug-19*	26-Aug-19
202	MOU-110	Second GW Sampling	5.0	5.0	0%	09-Sep-19*	13-Sep-19
203	MOU-115	Receipt of Analytical (2)	1.0	1.0	0%	27-Sep-19*	27-Sep-19
204	MOU-120	Submittal of Second Quarterly Report	45.0	45.0	0%	30-Sep-19*	29-Nov-19
205	MOU-125	Third GW Sampling	5.0	5.0	0%	09-Dec-19*	13-Dec-19
206	MOU-130	Receipt of Analytical (3)	1.0	1.0	0%	27-Dec-19*	27-Dec-19
207	**Northstar / Vermont Yankee Construction Office Building (COB) Demolition & Removal April 18 Update**		41.9	6.0		27-Feb-19 A	25-Apr-19
208	NS-COB-LOE	CONSTRUCTION OFFICE BUILDING (COB) DEMOLITION AND REMOVAL (LOE)	27.0	2.0	0%	27-Feb-19 A	22-Apr-19
209	**Northstar / VY Construction Office Building (COB) Demolition & Removal Work Package Development**		22.0	0.0		27-Feb-19 A	04-Apr-19 A
210	NS-COBWP-SMS	Scoping Meeting for COB Demolition Work Package (Including Abatement)	0.0	0.0	100%	27-Feb-19 A	
211	NS-COBWP-10	Review and Walkdown Work Package	0.5	0.0	100%	06-Mar-19 A	06-Mar-19 A
212	NS-COBWP-15	Edit and Finalize Work Package based on Walkdown	2.0	0.0	100%	06-Mar-19 A	04-Apr-19 A
213	NS-COBWP-05	Work Package Development	4.0	0.0	100%	28-Mar-19 A	03-Apr-19 A
214	NS-COBWP-FMS	Final Review and Approval	0.0	0.0	100%		04-Apr-19 A
215	**Northstar / VY Construction Office Building (COB) Above Grade Demolition & Removal**		40.9	6.0		11-Mar-19 A	25-Apr-19
216	NS-COB-02	Survey and Release Validation	2.0	0.0	100%	11-Mar-19 A	13-Mar-19 A
217	NS-COB-10	Universal Waste Removal inside COB	3.0	0.0	100%	11-Mar-19 A	13-Mar-19 A
218	NS-COB-01	Mobilization of Equipment and personnel (including required training)	1.0	0.0	100%	11-Mar-19 A	11-Mar-19 A
219	NS-COB-NOTICE	Send in Permit Notifications to State for Abatement	9.0	0.0	100%	12-Mar-19 A	22-Mar-19 A
220	NS-COB-05	Asbestos Abatement	4.0	0.0	100%	25-Mar-19 A	28-Mar-19 A
221	NS-COB-15	Above Grade Demolition	12.0	0.0	100%	08-Apr-19 A	10-Apr-19 A
222	NS-COB-SMS	Start Above Grade Demolition of the COB	0.0	0.0	100%	08-Apr-19 A	
223	NS-COB-30	Waste Disposal	3.0	2.0	90%	16-Apr-19 A	22-Apr-19
224	NS-COB-20	Waste Packaging	5.0	2.0	90%	16-Apr-19 A	22-Apr-19
225	NS-COB-25	Waste Shipping	5.0	2.0	90%	16-Apr-19 A	22-Apr-19
226	NS-COB-35	Nitrogen Tank Skid Removal	2.0	6.0	10%	18-Apr-19 A	25-Apr-19
227	NS-COB-FMS	Finish Above Grade Demolition of the COB	0.0	0.0	0%		22-Apr-19
228	**Northstar / Vermont Yankee Cooling Towers CT-1 & CT-2 Demolition & Removal April 18 Update**		77.0	69.0		04-Apr-19 A	15-Aug-19
229	NS-CT-LOE	Cooling Towers CT-1 and CT-2 Demolition and Removal [LOE]	74.0	64.0	0%	04-Apr-19 A	07-Aug-19
230	**Cooling Towers - Mobilization / Staging of Equipment**		1.0	0.0		16-Apr-19 A	18-Apr-19
231	NS-CT-MOBE	Cooling Towers In-Processing / Tranining / Mobilization / Prep / Staging of Demolition Equipment	1.0	0.0	100%	16-Apr-19 A	18-Apr-19
232	**Cooling Towers - Work Package Development**		18.0	10.0		04-Apr-19 A	06-May-19
233	**Cooling Towers - Abatement Work Package Development**		11.5	2.0		04-Apr-19 A	22-Apr-19
234	NS-CT-WPA-LOE	WPA - Cooling Towers - Abatement Work Package Development (LOE)	7.5	2.0	0%	04-Apr-19 A	22-Apr-19
235	NS-CT-WPA-SMS	WPA - Scoping Meeting for Cooling Towers Abatement Work Package	0.0	0.0	100%	04-Apr-19 A	
236	NS-CT-WPA-05	WPA - Abatement Work Package Development	4.0	0.0	100%	04-Apr-19 A	10-Apr-19 A
237	NS-CT-WPA-10	WPA - Review and Walkdown Work Package	0.5	0.0	100%	10-Apr-19 A	11-Apr-19 A
238	NS-CT-WPA-15	WPA - Edit and Finalize Work Package based on Walkdown	3.5	2.0	75%	15-Apr-19 A	22-Apr-19
239	NS-CT-WPA-FMS	WPA - Final Review and Approval	0.0	0.0	0%		22-Apr-19
240	**Cooling Towers - Above Grade Demolition & Removal Work Package Development**		10.5	10.0		17-Apr-19 A	06-May-19
241	NS-CT-WP-LOE	WP - Cooling Towers - Above Grade Demo Work Package Development (LOE)	8.0	10.0	0%	17-Apr-19 A	06-May-19
242	NS-CT-WP-SMS	WP - Scoping Meeting for Cooling Towers Abatement Work Package	0.0	0.0	100%	17-Apr-19 A	
243	NS-CT-WP-05	WP - Work Package Development	4.0	4.0	0%	23-Apr-19	29-Apr-19
244	NS-CT-WP-010	WP - Review and Walkdown Work Package	0.5	0.5	0%	30-Apr-19	30-Apr-19
245	NS-CT-WP-015	WP - Edit and Finalize Work Package based on Walkdown	3.5	3.5	0%	30-Apr-19	06-May-19
246	NS-CT-WP-FMS	WP - Final Review and Approval	0.0	0.0	0%		06-May-19
247	**Cooling Tower Asbestos Abatement**		56.0	53.0		15-Apr-19 A	18-Jul-19
248	NS-CT-ABMT-LOE	ABMT - Cooling Towers Asbestos Abatement	56.0	53.0	0%	15-Apr-19 A	18-Jul-19
249	NS-CT-ABMT-NOTI	ABMT - Send in Permit Notifications to State for Abatement	8.0	4.0	0%	15-Apr-19 A	24-Apr-19
250	NS-CT-ABMT-SMS	ABMT - Start Cooling Tower Asbestos Abatement	0.0	0.0	0%	29-Apr-19*	
251	NS-CT-ABMT-005	ABMT - Setup Containment - CT-1	1.0	1.0	0%	29-Apr-19	29-Apr-19
252	NS-CT-ABMT-010	ABMT - Perform Abatement - CT-1	22.0	22.0	0%	30-Apr-19	05-Jun-19
253	NS-CT-ABMT-015	ABMT - Tear Down Containment - CT-1	1.0	1.0	0%	06-Jun-19	06-Jun-19
254	NS-CT-ABMT-020	ABMT - Final Clearance Survey - CT-1	2.0	2.0	0%	06-Jun-19	10-Jun-19
255	NS-CT-ABMT-20	ABMT - Setup Containment - CT-2	1.0	1.0	0%	06-Jun-19	06-Jun-19
256	NS-CT-ABMT-25	ABMT - Perform Abatement - CT-2	22.0	22.0	0%	10-Jun-19	16-Jul-19
257	NS-CT-ABMT-30	ABMT - Tear Down Containment - CT-2	1.0	1.0	0%	17-Jul-19	17-Jul-19
258	NS-CT-ABMT-35	ABMT - Final Clearance Survey - CT-2	2.0	2.0	0%	17-Jul-19	18-Jul-19
259	NS-CT-ABMT-FMS	ABMT - Asbestos Abatement Complete	0.0	0.0	0%		18-Jul-19



#	Activity ID	Activity Name	OD	Rem Dur	% Comp	Start	Finish
260	**Cooling Tower Above Grade Demolition & Removal**		67.0	67.0		23-Apr-19	15-Aug-19
261	NS-CT-LOE-1	Cooling Tower Above Grade Demolition & Removal	62.0	62.0	0%	23-Apr-19	07-Aug-19
262	NS-CT-005	Universal Waste Removal	12.0	12.0	0%	23-Apr-19	13-May-19
263	NS-CT-SMS	Start Above Grade Demolition of the Cooling Towers (SMS)	0.0	0.0	0%	10-Jun-19*	
264	NS-CT-010	Cooling Tower Above Grade Demolition - CT-1	16.0	16.0	0%	10-Jun-19	04-Jul-19
265	NS-CT-015	Waste Handling	33.0	33.0	0%	10-Jun-19	05-Aug-19
266	NS-CT-020	Waste Packaging	35.0	35.0	0%	10-Jun-19	07-Aug-19
267	NS-CT-025	Waste Shipping and Disposal	35.0	35.0	0%	10-Jun-19	07-Aug-19
268	NS-CT-25	Cooling Tower Above Grade Demolition - CT-2	16.0	16.0	0%	22-Jul-19	15-Aug-19
269	NS-CT-FMS	Completion Cooling Tower Above Grade Demolition (FMS)	0.0	0.0	0%		07-Aug-19
270	**Northstar / Vermont Yankee Turbine & Components Removal April 18 Update**		137.2	137.2		01-May-19	26-Dec-19
271	**Northstar / Vermont Yankee Turbine Removal**		137.2	137.2		01-May-19	26-Dec-19
272	**Turbine - Mobilization / Staging of Equipment**		4.0	4.0		06-May-19	09-May-19
273	NS-TB-MOBE	Turbine / Turbine Building - Mobilization / Staging of Equipment	4.0	4.0	0%	06-May-19*	09-May-19
274	**Turbine - Abatement Work Package Development**		8.0	8.0		13-May-19	23-May-19
275	NS-T-AWP-LOE	AWP - Turbine Abatement Work Package Development & Approval (LOE)	8.0	8.0	0%	13-May-19	23-May-19
276	NS-T-AWP-SMS	AWP - Scoping Meeting for for Turbine Abatement Work Package (SMS)	0.0	0.0	0%	13-May-19*	
277	NS-T-AWP-005	AWP - Work Package Development	4.0	4.0	0%	13-May-19	16-May-19
278	NS-T-AWP-010	AWP - Review and Walkdown Work Package	0.5	0.5	0%	20-May-19	20-May-19
279	NS-T-AWP-015	AWP - Edit and Finalize Work Package based on Walkdown	3.5	3.5	0%	20-May-19	23-May-19
280	NS-T-AWP-FMS	AWP - Final Review and Approval	0.0	0.0	0%		23-May-19
281	**Turbine - Large Component Demolition & Removal Work Package Development**		8.0	8.0		27-May-19	06-Jun-19
282	NS-TBWP-LOE	Turbine - Large Component Demolition & Removal Work Package Development (LOE)	8.0	8.0	0%	27-May-19	06-Jun-19
283	NS-TBWP-005	Work Package Development	4.0	4.0	0%	27-May-19	30-May-19
284	NS-TBWP-SMS	Scoping Meeting for Turbine Removal Work Package	0.0	0.0	0%	27-May-19	
285	NS-TBWP-010	Review and Walkdown Work Package	0.5	0.5	0%	03-Jun-19	03-Jun-19
286	NS-TBWP-015	Edit and Finalize Work Package based on Walkdown	3.5	3.5	0%	03-Jun-19	06-Jun-19
287	NS-TBWP-FMS	Final Review and Approval	0.0	0.0	0%		06-Jun-19
288	**Turbine - Asbestos Abatement**		51.0	51.0		01-May-19	29-Jul-19
289	NS-TAA-LOE	TAA -Turbine Asbestos Abatement (LOE)	51.0	51.0	0%	01-May-19	29-Jul-19
290	NS-TAA-NOTICE	TAA -Send in Permit Notifications to State for Abatement	14.0	14.0	0%	01-May-19	23-May-19
291	NS-TAA-SMS	TAA - Start Turbine Asbestos Abatement	0.0	0.0	0%	28-May-19*	
292	NS-TAA-005	TAA -Setup Containment	2.0	2.0	0%	28-May-19	29-May-19
293	NS-TAA-010	TAA -Perform Abatement	32.0	32.0	0%	30-May-19	24-Jul-19
294	NS-TAA-015	TAA -Tear Down Containment	2.0	2.0	0%	25-Jul-19	29-Jul-19
295	NS-TAA-020	TAA -Final Clearance Survey	2.0	2.0	0%	25-Jul-19	29-Jul-19
296	NS-TAA-FMS	TAA -Asbestos Abatement Complete	0.0	0.0	0%		29-Jul-19
297	**Turbine - Demolition & Removal**		86.2	86.2		30-Jul-19	26-Dec-19
298	NS-TDR-005	TDR - Universal Waste Removal	3.2	3.2	0%	30-Jul-19	05-Aug-19
299	NS-TDR-SMS	TDR - Start Above Grade Demolition of the Cooling Towers SMS	0.0	0.0	0%	05-Aug-19	
300	NS-TDR-010	TDR - Decon	8.0	8.0	0%	05-Aug-19	19-Aug-19
301	NS-TDR-015	TDR - Demolition Prep	37.0	37.0	0%	19-Aug-19	22-Oct-19
302	NS-TDR-020	TDR - Piping Removal	37.0	37.0	0%	19-Aug-19	22-Oct-19
303	NS-TDR-025	TDR - Equipment Removal	37.0	37.0	0%	19-Aug-19	22-Oct-19
304	NS-TDR-030	TDR - Piping Waste Handling	37.0	37.0	0%	26-Aug-19	29-Oct-19
305	NS-TDR-035	TDR - Equipment Waste Handling	37.0	37.0	0%	26-Aug-19	29-Oct-19
306	NS-TDR-045	TDR - Demolition (Turbine Removal)	30.0	30.0	0%	29-Oct-19	19-Dec-19
307	NS-TDR-040	TDR - Demolition Waste Packaging	30.0	30.0	0%	05-Nov-19	26-Dec-19
308	NS-TDR-050	TDR - Demolition Waste Handling	30.0	30.0	0%	05-Nov-19	26-Dec-19
309	**Northstar / Vermont Yankee Turbine Building Asbestos Abatement**		29.0	29.0		10-Jun-19	30-Jul-19
310	**Turbine Building - Mobilization / Staging of Equipment**		0.0	0.0		30-Jul-19	30-Jul-19
311	NS-TB1-LOE	Northstar / VY Turbine Building Mobilization / Staging of Equipment	0.0	0.0	0%	30-Jul-19	30-Jul-19
312	**Turbine Building - Abatement Work Package Development**		7.2	7.2		10-Jun-19	20-Jun-19
313	NS-TB-APW-LOE	Northstar / VY Turbine Building Asbestos Abatement Work Package Planning (LOE)	7.2	7.2	0%	10-Jun-19	20-Jun-19
314	NS-TB-AWP-SMS	Scoping Meeting for Turbine Building Abatement Work Package	0.0	0.0	0%	10-Jun-19	
315	NS-TB--AWP-005	Work Package Development	4.0	4.0	0%	10-Jun-19	13-Jun-19
316	NS-TB--AWP-010	Review and Walkdown Work Package	0.8	0.8	0%	17-Jun-19	17-Jun-19
317	NS-TB--AWP-015	Edit and Finalize Work Package based on Walkdown	2.4	2.4	0%	17-Jun-19	20-Jun-19
318	NS-TB--AWP-FMS	Final Review and Approval	0.0	0.0	0%		20-Jun-19
319	**Turbine Building - Asbestos Abatement**		8.8	8.8		15-Jul-19	30-Jul-19
320	NS-TBA-NOTICE	TBA - Send in Permit Notifications to State for Abatement	8.8	8.8	0%	15-Jul-19	29-Jul-19
321	NS-TBA-SMS	TBA - Start Turbine Asbestos Abatement SMS	0.0	0.0	0%	30-Jul-19	



Glucksberg, Nadia

From: Glucksberg, Nadia
Sent: Friday, May 3, 2019 2:33 PM
To: Noyes, Gerold
Cc: Daniels, Corey; Langub, Nelson; Fekert, Dennis; Gonda, Jordan; Simoes, Steve; Irwin, William; Kinnick, Christopher; Reid, Billy; Di Carlo, Gregory
Subject: RE: NorthStar Vermont Yankee Response to Comments on Work Plans
Attachments: 2019-0503 VY WP and QAPP submittal letter.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Good Afternoon Gerold

As we discussed earlier this week, and in accordance with the MOU, we are providing revised work plans and QAPP for your review and approval. All changes have been made in accordance with our Response to Comments submittal dated April 16, and are highlighted in redline/strikeout to help facilitate your review.

Because of the size of the documents, they may be downloaded at the following link:

https://haleyaldrich.sharefile.com/d-s9f9587da9ea47af8

if you have any issues with the download, please do not hesitate to call us at any time. A copy of the cover letter that accompanies the documents is also attached.

Enjoy your weekend and we look forward to our continued collaboration.

Nadia

Nadia Glucksberg, PG, LEP
Haley & Aldrich, Inc.
75 Washington Ave, Suite 1A
Portland, ME 04101
Office: 207.482.4623
Cell: 207.632.4016
nglucksberg@haleyaldrich.com

From: Glucksberg, Nadia
Sent: Tuesday, April 16, 2019 3:03 PM
To: Noyes, Gerold <Gerold.Noyes@vermont.gov>
Cc: Daniels, Corey <CDaniels@Northstar.com>; Langub, Nelson <nlangub@northstar.com>; Fekert, Dennis <Dennis.Fekert@vermont.gov>; Gonda, Jordan <Jordan.Gonda@vermont.gov>; Simoes, Steve <Steve.Simoes@vermont.gov>; Irwin, William <William.Irwin@vermont.gov>; Kinnick, Christopher <Christopher.Kinnick@vermont.gov>; Reid, Billy <breid@NorthStar.com>; Di Carlo, Gregory <GDiCarlo@NorthStar.com>
Subject: NorthStar Vermont Yankee Response to Comments on Work Plans

Good Afternoon Gerold

Thank you for the comments on our work plan for the characterization of the NorthStar Vermont Yankee site. As we discussed last week, we are providing our responses for your review and with your concurrence we will finalize the work plans. Because we agree with most of the comments, and with your verbal approval, are planning to begin collecting samples "at risk" to meet the report schedule set forth in the MOU. We will start the mobilization and begin utility clearance next week. However, if there are any issues that we need to discuss or come to agreement on, we will make sure they are resolved before we complete this phase of the investigation activities.

To meet the intention of the comments on building materials, we also have provided the additional ACM data collected from the COB building to document that the paint, siding, concrete, and wall board were documented with negative results (i.e. no ACM present).

Finally, we do still owe you the decommissioning schedule, including building demolition, and we will be sending that along under separate cover.

As always if you have any questions, please feel free to reach out as we are happy so set up another call to discuss any of our responses.

Respectfully,

Nadia

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From: Noyes, Gerold <Gerold.Noyes@vermont.gov>
Sent: Thursday, April 04, 2019 1:27 PM
To: Glucksberg, Nadia <NGlucksberg@haleyaldrich.com>
Cc: Daniels, Corey <CDaniels@Northstar.com>; Langub, Nelson <nlangub@northstar.com>; Fekert, Dennis <Dennis.Fekert@vermont.gov>; Gonda, Jordan <Jordan.Gonda@vermont.gov>; Simoes, Steve <Steve.Simoes@vermont.gov>; Irwin, William <William.Irwin@vermont.gov>; Kinnick, Christopher <Christopher.Kinnick@vermont.gov>; Tom Broido <tom.broido@atcgs.com>
Subject: Please see the attached letters reviewing the Haley & Aldrich site investigation workplans for NorthStar Vermont Yankee

Good afternoon Nadia,

Attached please find the DEC review letter for the previously submitted H&A Non-Radiological Sampling, Building Characterization, and Quality Assurance Project Plans. Additional comments were provided by ATC Group Services under contract to the DEC. ATC comments are provided in three accompanying letters prepared by the individual reviewer.

The Vermont Department of Health is reviewing the Building Characterization Plan since it also covers lead and asbestos sampling for abatement and industrial hygiene, which come under DOH jurisdiction.

Please e-mail or call me with any questions, if I can't answer them I will forward them to the correct person.

Regards,

Gerold Noyes, PE

Department of Environmental Conservation
Sites Management Section
1 National Life Drive – Davis 1
Montpelier, VT 05620-3704

Gerold.noyes@vermont.gov
(802) 522-5614

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Portland, ME 04101
207.482.4600

SVY-19-021

3 May 2019
File No. 129657-009

Mr. Gerold Noyes
Vermont Agency of Natural Resources
Department of Environmental Conservation
Waste Management and Prevention Division
1 National Life Dr – Davis 1
Montpelier, VT 05620-3704

Subject: Limited Non-Radiological Site Sampling Plan, Rev. G, Vermont Yankee Nuclear Power Station, Vernon, Vermont, Haley & Aldrich, April 2019.

Quality Assurance Project Plan, Rev. F, Characterization of Environmental Media Decontamination and Decommissioning Support, Vermont Yankee Nuclear Power Station, Vernon, Vermont, Haley & Aldrich, April 2019.

Dear Mr. Noyes:

Thank you for the Vermont Department of Environmental Conservation Waste Management and Prevention Division (WMPD) comments on the Site Investigation plans submitted on behalf of NorthStar Nuclear Decommissioning Company (NNDC) as well as the additional comments provided by your consultants, ATC Group Services, Inc. (ATC). These work plans were submitted in accordance with the Memorandum of Understanding #8880 (MOU), dated December 8, 2018. On 4 April 2019, we received comments on the subject documents.

On 19 April 2019, we provided a summary of our proposed responses for your review and approval, prior to revising the documents. However, to meet the deadlines imposed in the MOU, we are also formally submitting the revised Limited Non-Radiological Site Sampling Plan, Rev G as well as the revised Quality Assurance Project Plan, Rev F. for your review and approval. Per our conversation yesterday, the documents are published with edits highlighted in redline/strikeout to better facilitate your review.

As noted in our Response to Comment letter, we have accepted most of your recommendations to the environmental investigation (i.e. soils, groundwater, sediments) and have proceeded at risk with the field investigation and sample collection, in order to meet the report deadline of 11 July 2019. Where recommendations were not accepted outright, we provided additional explanation for clarification and to address your concerns.

If you have any questions or concerns, please do not hesitate to call Nadia Glucksberg at 207-632-4016 or Corey Daniels at 802-451-5354 Ext. 2501 at any time. We look forward to our continued collaboration to welcome your comments and insight.

Sincerely yours,
HALEY & ALDRICH, INC.

Nadia S. Glucksberg
Senior Associate | Hydrogeologist

Miles van Noordennen
Sr. Technical Specialist

Enclosures:

Limited Non-Radiological Site Sampling Plan, Rev. G, Vermont Yankee Nuclear Power Station, Vernon, Vermont, Haley & Aldrich, 13 February 2019.

Quality Assurance Project Plan, Rev. F, Characterization of Environmental Media Decontamination and Decommissioning Support, Vermont Yankee Nuclear Power Station, Vernon, Vermont, Haley & Aldrich, February 2019.

cc: Billy Reid, NNDC (electronic copy)
Corey Daniels, NNDC (electronic copy)
Nelson Langub, NNDC (electronic copy)
Greg DiCarlo, NNDC (electronic copy)

VERMONT

State of Vermont
Department of Environmental Conservation
Waste Management and Prevention Division
1 National Life Dr – Davis 1
Montpelier, VT 05620-3704
(802) 522-5614
gerold.noyes@vermont.gov

AGENCY OF NATURAL RESOURCES

June 21, 2019
E-mail

NADIA GLUCKSBERG
HALEY & ALDRICH, INC.
75 WASHINGTON AVE, SUITE 1A
PORTLAND, ME 04101
NGlucksberg@haleyaldrich.com

RE: Vermont Yankee work plan approvals

Dear Ms. Glucksberg:

Haley & Aldrich submitted the following revised site sampling work plan and the revised quality assurance project plans to the Vermont Department of Environmental Conservation Waste Management and Prevention Division (WMPD) and the Vermont Department of Health (VT DOH).

> *Limited Non-Radiological Site Sampling Plan, Rev. G, Vermont Yankee Nuclear Power Station, Vernon, Vermont, Haley & Aldrich, 2 May 2019.*
>
> *Quality Assurance Project Plan, Rev. F, Characterization of Environmental Media Decontamination and Decommissioning Support, Vermont Yankee Nuclear Power Station, Vernon, Vermont, Haley & Aldrich, April 2019.*

Given the limited time frame, Haley & Aldrich accepted comments or provided suitable explanations and proceeded with the work plans at their risk under a verbal approval.

We have completed our reviews of the revised documents.

There are no further comments on the revised QAPP, Rev. F.

I made two minor comments on page 29 and 110 to the Site Sampling Plan, Rev. G regarding the number of existing site monitor wells and the number to be sampled; we already discussed these in a telephone call. You agreed that they were minor and would be incorporated in the final document. The VT DOH had no comments on the revised site sampling work plan.

As we have previously noted, the Investigation and Remediation of Contaminated Properties Rule (IRule) has been under revision for the past 2 years. The 2019 IRule has been approved and will be effective as of July 6, 2019.

over

Any references in the QAPP, Rev. F to earlier versions of the IRule or the predecessor guidance document and the standards contained therein, shall be replaced with the July 6, 2019 IRule. With the above said, the QAPP, Rev. F. is approved as revised.

Any references in the Site Sampling Plan, Rev. G to earlier versions of the IRule or the predecessor guidance document and the standards contained therein shall be replaced with the July 6, 2019 IRule. With the above said, the Site Sampling Plan, Rev. G is approved as revised.

Please feel free to contact me if you have any questions.

Sincerely,

Gerold Noyes, P.E.
Environmental Engineer
Sites Management Section

CC: Corey Daniels, NorthStar
Nelson Langub, NorthStar
Dennis Fekert, VT DEC Solid Waste Program
Jordan Gonda, VT ANR DEC Attorney
Steve Simoes, VT DEC Hazardous Waste Program
Chuck Schwer, VT DEC Waste Management and Prevention Division Chief
Bill Irwin, ScD, VT DOH Radiological Sciences Chief
Christopher Kinnick, VT DOH Asbestos and Lead Program Senior Engineer

APPENDIX B

Selected Geological and Hydrogeological Plans

LEGEND

GZ-23S MONITORING WELL INSTALLED BY GZA

EW-2 EXTRACTION WELL INSTALLED BY GZA

SOUTHWEST WELL BEDROCK WATER SUPPLY WELL

321-1 OTHER VERMONT YANKEE MONITORING WELL

SG-1 STAFF GAUGE INSTALLED BY GZA

STW-1 STILLING WELL INSTALLED BY GZA

SW – RIVER SAMPLE SURFACE WATER SAMPLING LOCATION

NOTES:

1. BASE PLAN, INCLUDING SITE SURFACE TOPOGRAPHY, PROVIDED TO GZA IN ELECTRONIC FORMAT BY VERMONT YANKEE.
2. THE LOCATIONS AND REFERENCE ELEVATIONS OF MONITORING WELLS, ONSITE WATER SUPPLY WELLS, STILLING WELLS AND STAFF GAUGES WERE SURVEYED BY SOUTHERN VERMONT ENGINEERING OF BRATTLEBORO VERMONT. LOCATIONS OF OTHER WATER SUPPLY WELLS BASED ON PR-10 OBSERVATIONS.

0 30' 100' 200' 300'

1 INCH = 100 FEET

ENTERGY VERMONT YANKEE

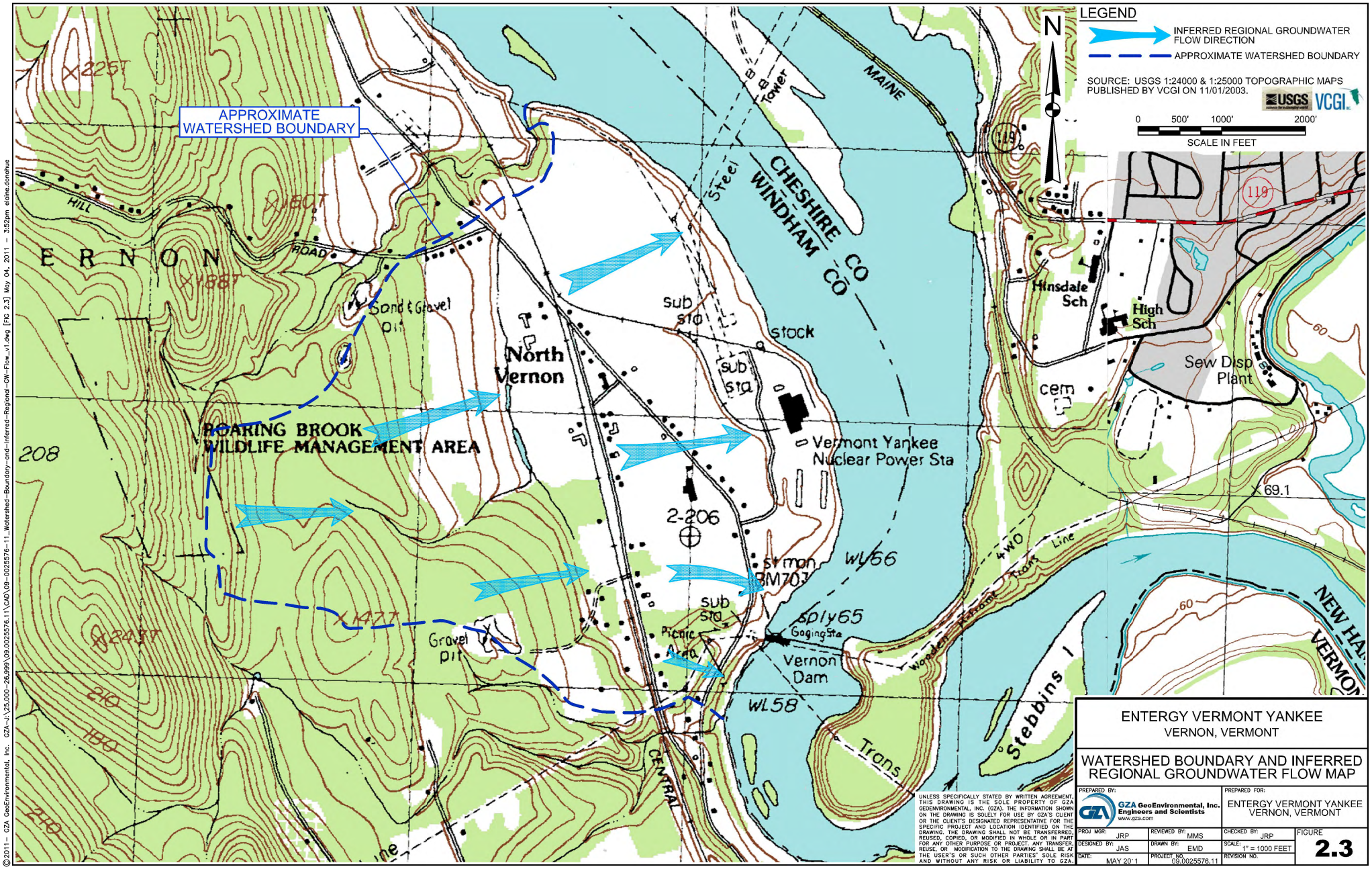
VERNON, VERMONT

SITE PLAN
SHOWING EXPLORATION LOCATIONS

UNLESS SPECIFICALLY STATED BY WRITTEN AGREEMENT, THIS DRAWING IS THE SOLE PROPERTY OF GZA GeoEnvironmental, Inc. AND MAY NOT BE REPRODUCED ON THE DRAWING IS SOLELY FOR USE BY GZA CLIENT ON THE PROJECT REPRESENTED BY THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED TO OTHERS WITHOUT THE PRIOR WRITTEN CONSENT OF GZA, OR RELEASED TO THE PUBLIC IF ALTERED FROM THE ORIGINAL DESIGN. GZA ASSUMES NO RESPONSIBILITY FOR DAMAGE OR MISUSE TO THE DRAWING SHALL BE AT THE CLIENT'S OR OTHER THIRD PARTIES SOLE RISK, AND WITHOUT ANY RISK OR LIABILITY TO GZA.

PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists Norwood, MA		PREPARED FOR: ENTERGY VERMONT YANKEE VERNON, VERMONT	
FIELD REP. JRP	REVIEWED BY: KWS	CHECKED BY: JRP	FIGURE
DESIGNED BY: TJAS	DRAWN BY: CMD	SCALE: 1" = 100'	1.2
DATE: MAY 2011	PROJECT NO. 06.0025576.11	REVISION NO.	

© 2011 – GZA GeoEnvironmental, Inc. G:\0-\0025576\ENVIRONMENTAL\11\0025576-11-Exploration_Plan.dwg [Site Plan 1.2] Sat May 14, 2011 - 3:31pm ebhardman



ENTERGY VERMONT YANKEE
VERNON, VERMONT

WATERSHED BOUNDARY AND INFERRED REGIONAL GROUNDWATER FLOW MAP

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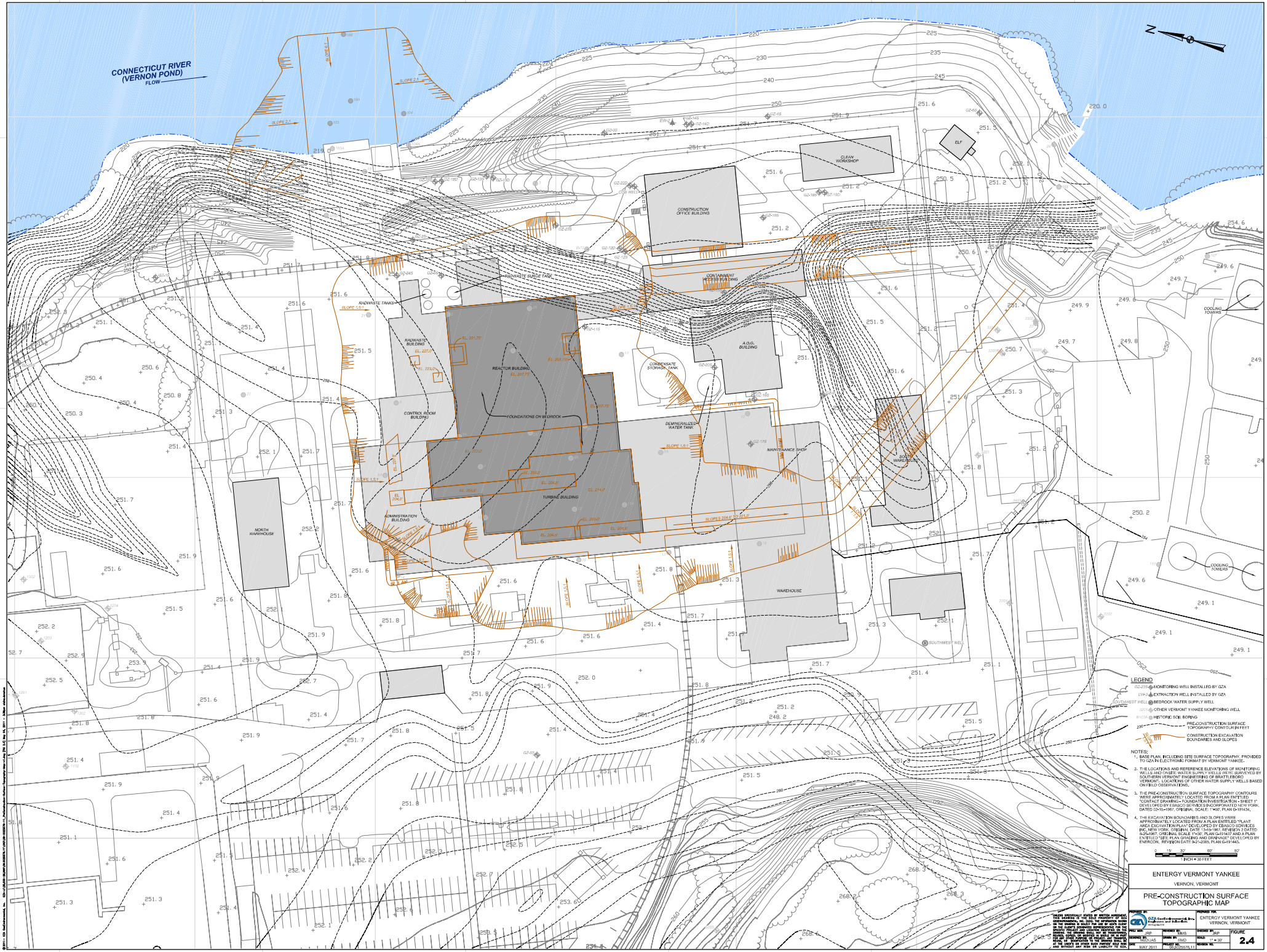
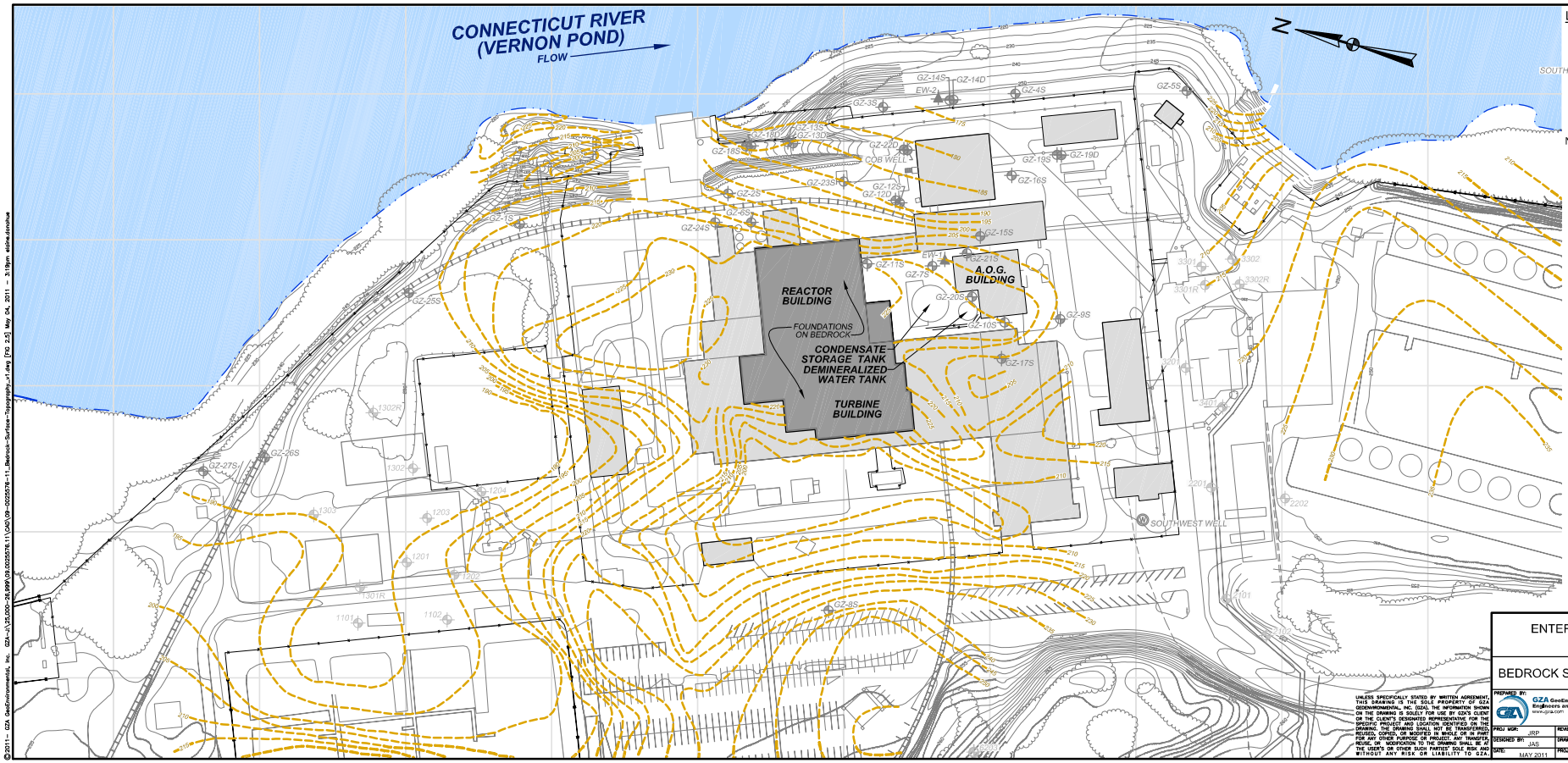
PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com			PREPARED FOR: ENTERGY VERMONT YANKEE VERNON, VERMONT
PROJ MGR: JRP	REVIEWED BY: MMS	CHECKED BY: JRP	FIGURE 2.3
DESIGNED BY: JAS	DRAWN BY: EMD	SCALE: 1" = 1000 FEET	
DATE: MAY 20'1	PROJECT NO. 09.0025576.11	REVISION NO.	

©2011 – GZA GeoEnvironmental, Inc. GZA-U:\25,000-26,999\09.0025576.11\CAD\09-0025576-11_Watershed-Boundary-and-Inferred-Regional-GW-Flow_v1.dwg [FIG 2.3] May 04, 2011 – 3:52pm eloine.donohue


CONNECTICUT RIVER
(VERNON POND)
FLOW
N
CLEAN WORKSHOP
ELF
CONSTRUCTION OFFICE BUILDING
CONTAINMENT ACCESS BUILDING
RADWASTE SURGE TANK
RADWASTE TANKS
RADWASTE BUILDING
REACTOR BUILDING
CONDENSATE STORAGE TANK
A.O.G. BUILDING
CONTROL ROOM BUILDING
FOUNDATIONS ON BEDROCK
DEMINERALIZED WATER TANK
MAINTENANCE SHOP
OIL WAREHOUSE
TURBINE BUILDING
ADMINISTRATION BUILDING
NORTH WAREHOUSE
WAREHOUSE
COOLING TOWERS
COOLING TOWERS
SOUTHWEST WELL
SLOPE 2:1
SLOPE 1.5:1
SLOPE 1.5:1
SLOPE 1.5:1
SLOPE 1.5:1
SLOPE 1.5:1
SLOPE 1.5:1
SLOPES 2.5:1 TO 3.5:1
LEGEND
GZ-215 MONITORING WELL INSTALLED BY GZA
EW-2 EXTRACTION WELL INSTALLED BY GZA
SOUTHWEST WELL BEDROCK WATER SUPPLY WELL
3201 OTHER VERMONT YANKEE MONITORING WELL
B103A HISTORIC SOIL BORING
PRE-CONSTRUCTION SURFACE TOPOGRAPHY CONTOUR IN FEET
CONSTRUCTION EXCAVATION BOUNDARIES AND SLOPES
NOTES:
1. BASE PLAN, INCLUDING SITE SURFACE TOPOGRAPHY, PROVIDED TO GZA IN ELECTRONIC FORMAT BY VERMONT YANKEE.
2. THE LOCATIONS AND REFERENCE ELEVATIONS OF MONITORING WELLS AND ONSITE WATER SUPPLY WELLS WERE SURVEYED BY SOUTHERN VERMONT ENGINEERING OF BRATTLEBORO VERMONT. LOCATIONS OF OTHER WATER SUPPLY WELLS BASED ON FIELD OBSERVATIONS.
3. THE PRE-CONSTRUCTION SURFACE TOPOGRAPHY CONTOURS WERE APPROXIMATELY LOCATED FROM A PLAN ENTITLED "CONTACT DRAWING - FOUNDATION INVESTIGATION - SHEET 1" DEVELOPED BY EBASCO SERVICES INCORPORATED NEW YORK DATED 02-15-1967, ORIGINAL SCALE: 1"=60', PLAN G-191434.
4. THE EXCAVATION BOUNDARIES AND SLOPES WERE APPROXIMATELY LOCATED FROM A PLAN ENTITLED "PLANT AREA EXCAVATION PLAN" DEVELOPED BY EBASCO SERVICES INC, NEW YORK. ORIGINAL DATE: 7-13-1967, REVISION 3 DATED 5-25-1967, ORIGINAL SCALE: 1"=30', PLAN G-191437 AND A PLAN ENTITLED "SITE PLAN GRADING AND DRAINAGE" DEVELOPED BY ENERCON. REVISION DATE 9-2-2005, PLAN G-191440.
0 15' 30' 60' 90'
1 INCH = 30 FEET
ENTERGY VERMONT YANKEE
VERNON, VERMONT
PRE-CONSTRUCTION SURFACE TOPOGRAPHIC MAP
PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists
PREPARED FOR: ENTERGY VERMONT YANKEE VERNON, VERMONT
FIELD WORK: JSP
REVIEWED: MWS
DRAWN BY: LUD/JAS
CHECKED: BP
SCALE: 1" = 30'
DATE: MAY 2011
PROJECT NO.: 06.0025576.11
REVISION NO.:
FIGURE 2.4
TAKES PRECEDENCE OVER IF WRITTEN AGREEMENT THE DRAWING IS THE SOLE PROPERTY OF GZA GEOENVIRONMENTAL, INC. THE INFORMATION ON THE DRAWING IS SOLELY FOR USE BY GZA CLIENT OR THE SURVEY PROPERTIES REPRESENTED ON THE DRAWING. THE DRAWING SHALL NOT BE TRANSFERRED TO OTHER PARTIES OR USED FOR OTHER PURPOSES THAN THE PURPOSE FOR WHICH IT WAS PREPARED OR ENGAGEMENT TO THE DRAWING SHALL BE AT THE CLIENT'S OR OTHER PARTIES' SOLE RISK AND WITHOUT ANY RISK OR LIABILITY TO GZA.



LEGEND

- GZ-23S — MONITORING WELL INSTALLED BY GZA
- EW-2 — EXTRACTION WELL INSTALLED BY GZA
- SOUTHWEST WELL — BEDROCK WATER SUPPLY WELL
- 3201 — OTHER VERMONT YANKEE MONITORING WELL
- 220 — BEDROCK ELEVATION CONTOURS

NOTES:

1. BASE PLAN, INCLUDING SITE SURFACE TOPOGRAPHY, PROVIDED TO GZA IN ELECTRONIC FORMAT BY VERMONT YANKEE.
2. THE LOCATIONS AND REFERENCE ELEVATIONS OF MONITORING WELLS AND ONSITE WATER SUPPLY WELLS WERE SURVEYED BY SOUTHERN VERMONT ENGINEERING OF BRATTLEBORO VERMONT. LOCATIONS OF OTHER WATER SUPPLY WELLS BASED ON FIELD OBSERVATIONS.
3. THE BEDROCK ELEVATION CONTOURS WERE DEVELOPED FROM ELECTRONIC FILES PROVIDED BY THE CLIENT ENTITLED "FOUNDATION INVESTIGATION - SHEET 1", DATED FEBRUARY 15, 1967, ORIGINAL SCALE: 1"=50', DRAWING NO.: G-191434, ELECTRONIC FILE: G-191434.TIF, "FOUNDATION INVESTIGATION - SHEET 2", DATED FEBRUARY 15, 1967, ORIGINAL SCALE: 1"=20', DRAWING NO.: G-191435, ELECTRONIC FILE: G-191435.TIF, "FOUNDATION INVESTIGATION - SHEET 3", DATED FEBRUARY 15, 1967, ORIGINAL SCALE: 1"=20', DRAWING NO.: G-191436, ELECTRONIC FILE: G-191436.TIF & "FOUNDATION INVESTIGATION - SHEET 4", DATED JUNE 17, 1968, ORIGINAL SCALE: 1" = 100' & 1"=20', DRAWING NO.: G-191445, ELECTRONIC FILE: G-191445.TIF.

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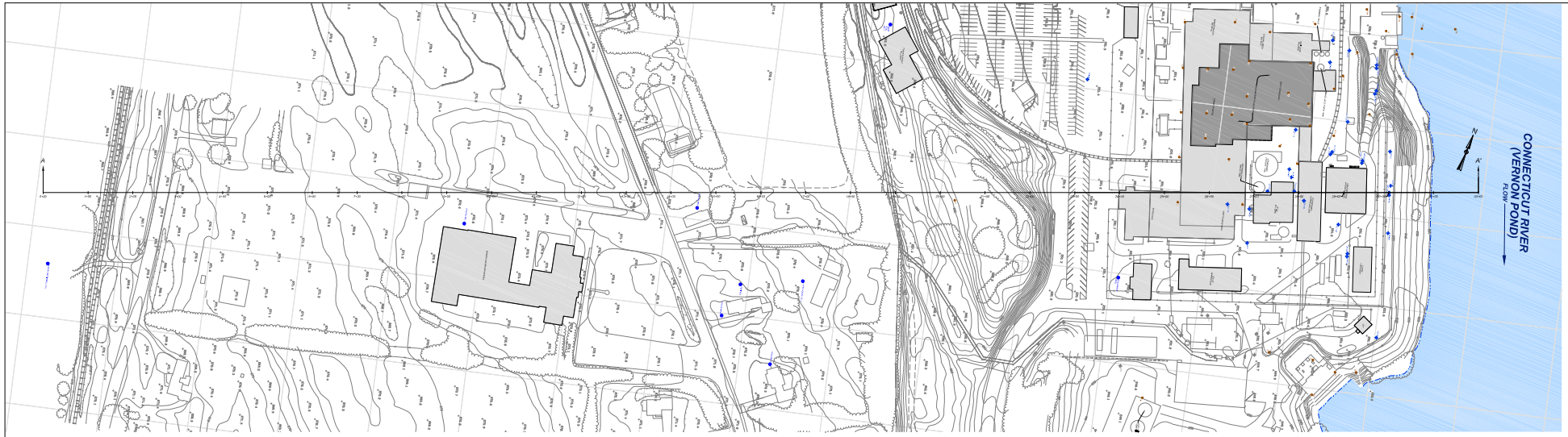
PREPARED FOR: ENTERGY VERMONT YANKEE VERNON, VERMONT

ENTERGY VERMONT YANKEE
VERNON, VERMONT

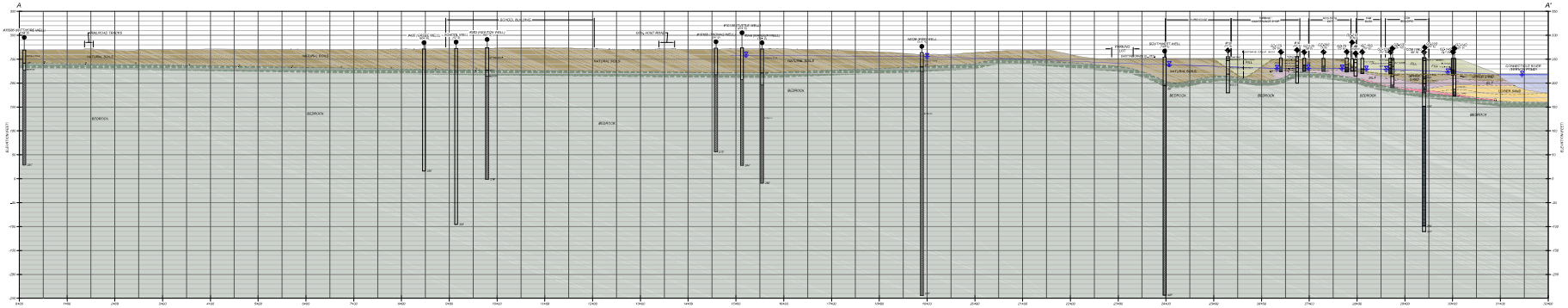
BEDROCK SURFACE TOPOGRAPHY MAP

PROJ MGR: JRP	REVIEWED BY: MMS	CHECKED BY: JRP	FIGURE
DESIGNED BY: IAS	DRAWN BY: EMD	SCALE: 1" = 100 FEET	2.5
DATE: MAY 2011	PROJECT NO.: 03.0025576.11	REVISION NO.	

©2011 - GZA GeoEnvironmental, Inc. GZA-J:\25,000-26,999\03\0025576.11\CAD\09-0025576-11_Bedrock-Surface-Topography_v1.dwg [FIG 2.5] May 04, 2011 - 3:19pm eldre.donohue



PLAN
SCALE: 1" = 80'



PROFILE A-A'
SCALE: 1" = 80'

BASE PLAN LEGEND

EG-1 ● EXTRACTION WELL INSTALLED BY GZA
EW-1 ● EXTRACTION WELL INSTALLED BY GZA
SOUTHWEST WELL ● BEDROCK WATER SUPPLY WELL
101 ● OTHER VERMONT YANKEE MONITORING WELL
● DETECTED ISOTOPE

PROFILE KEY

SOIL BORINGS

BEDROCK WELL INSTALLATIONS

NOTES:

1. BASE PLAN INCLUDES SITE SURFACE TOPOGRAPHY, SITE FEEDS AND BUILDINGS, AND SOME SITE UTILITIES AS OF 2011.
2. THE GEOLOGIC AND HYDROGEOLOGIC INTERPRETATIONS OF SOIL BORING, WELLS AND CONTROL WATER SUPPLY WELLS WERE SUPPLIED BY GZA. THE GEOLOGIC INTERPRETATIONS ARE BASED ON VISUAL OBSERVATIONS, LABORATORY TESTING, AND OTHER DATA PROVIDED BY THE WELL DRILLERS ON FIELD OBSERVATIONS.
3. THE STRATA CONTOURS ARE APPROXIMATE, BASED UPON DATA PROVIDED BY THE NUMBER OF WELLS, SOIL BORINGS, AND TEST PITS. THE STRATA CONTOURS ARE ALSO BASED ON ASSUMPTIONS REGARDING THE GEOLOGIC CONDITIONS BETWEEN THE WELLS, SOIL BORINGS, AND TEST PITS. THE STRATA CONTOURS ARE ALSO BASED ON DATA PROVIDED BY GZA.
4. THE POTENTIOMETRIC SURFACE CONTOURS WERE INFERRED BASED UPON ONLY 1 SURVEY OCCURRENCE. ALL STRATA CONTOURS, POTENTIOMETRIC SURFACE CONTOURS, AND WATER SURFACE BASED UPON WATER LEVELS MEASURED IN BEDROCK WELLS, OPEN WATER LEVELS MEASURED IN SOIL BORINGS, OR WATER LEVELS MEASURED IN WELLS HAVE BEEN ADJUSTED TO REFLECT THE ELEVATION OF THE RIVER WATER SURFACE. THE ADJUSTMENT WAS MADE BY ADDING THE DIFFERENCE BETWEEN THE RIVER WATER SURFACE ELEVATION AND THE ELEVATION OF THE WELL OR SOIL BORING STAND PIPE TOP.

1 INCH = 20 FEET

ENTERGY VERMONT YANKEE
VERNON, VERMONT

HYDROGEOLOGIC PROFILE A-A'

GZA GEOTECHNICAL ENGINEERING & ENVIRONMENTAL SCIENCES	ENTERGY - VERMONT YANKEE VERNON, VERMONT		
	DRAWN BY	CHECKED BY	PROJECT
	DATE	REVISED	5.1
	APPROVED BY		

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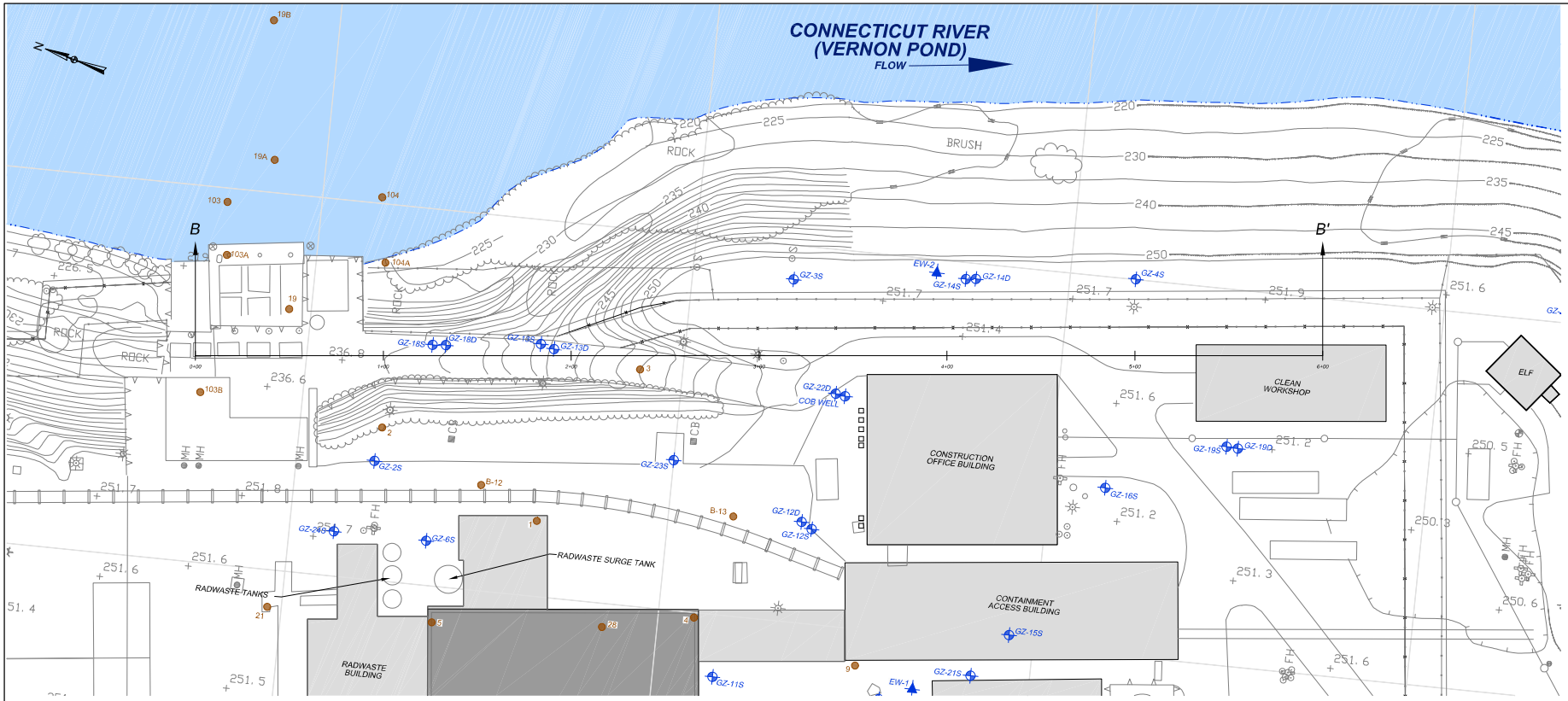
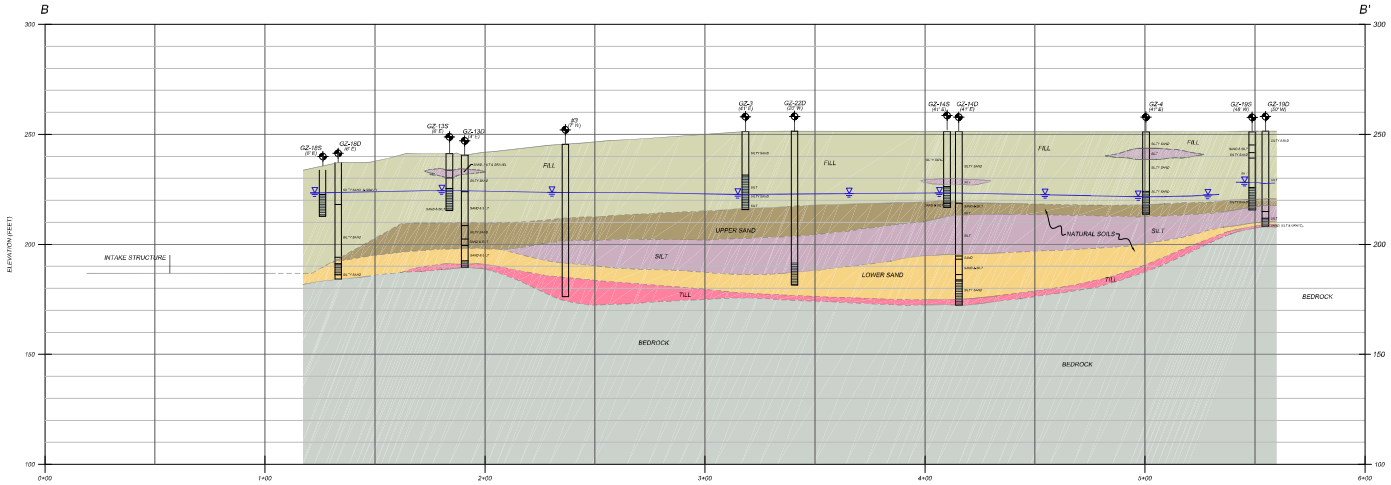


PLAN
SCALE: 1" = 20'



PROFILE B-B'
SCALE: 1" = 20'

BASE PLAN LEGEND

- GZ-23S MONITORING WELL INSTALLED BY GZA
- EW-2 EXTRACTION WELL INSTALLED BY GZA
- SOUTHWEST WELL BEDROCK WATER SUPPLY WELL
- 3201 OTHER VERMONT YANKEE MONITORING WELL
- 9 HISTORIC SOIL BORING

PROFILE KEY

- GZ-16S (ft. ft.) MONITORING WELL DESIGNATION OFFSET DIRECTION & DISTANCE
- GROUND SURFACE
- WELL CASING
- POTENTIOMETRIC SURFACE
- APPROXIMATE STRATUM CHANGE
- WELL SCREEN

NOTES:

1. BASE PLAN, INCLUDING SITE SURFACE TOPOGRAPHY, PROVIDED TO GZA IN ELECTRONIC FORMAT BY VERMONT YANKEE.
2. THE LOCATIONS AND REFERENCE ELEVATIONS OF MONITORING WELLS AND WATER SUPPLY WELLS WERE ESTABLISHED BY SOUTHERN VERMONT ENGINEERING, BRATTLEBORO, VERMONT. LOCATIONS OF OTHER WATER SUPPLY WELLS BASED ON FIELD OBSERVATIONS.
3. THE STRATIFICATION LINES ARE APPROXIMATE, BASED UPON DATA FROM A LIMITED NUMBER OF WIDELY SPACED EXPLORATIONS AND THUS REPRESENT APPROXIMATE BOUNDARIES BETWEEN STRATUM TYPES. THE ACTUAL TRANSITIONS ARE EXPECTED TO BE MORE GRADUAL AND VARY FROM THOSE SHOWN.
4. THE POTENTIOMETRIC SURFACE DEPICTED WAS INFERRED BASED UPON WIDELY SPACED DATA POINTS. ALTERNATE INTERPRETATIONS ARE POSSIBLE. THE POTENTIOMETRIC SURFACE IS BASED UPON WATER LEVELS MEASURED ON DECEMBER 15, 2010 IN THE MONITORING WELLS. VARIATIONS IN SAND LENS GROUNDWATER ARE LIKELY DUE TO EFFECTS OF WATER LEVEL FLUCTUATIONS IN THE CONNECTICUT RIVER, HETEROGENEOUS ANISOTROPIC AQUIFER CONDITIONS AND OTHER FACTORS.

0 10' 20' 40' 60'
1 INCH = 20 FEET

ENTERGY VERMONT YANKEE
VERNON, VERMONT

HYDROGEOLOGIC PROFILE B-B'

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PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists Portsmouth		PREPARED FOR: ENTERGY VERMONT YANKEE VERNON, VERMONT	
FIELD REP. JRP	REVIEWED BY: KWS	CHECKED BY: JRP	FIGURE
DESIGNED BY: TJS	DRAWN BY: MDJ/JC	SCALE: 1" = 20'	5.2
DATE: MAY 2011	PROJECT NO. 06.0025576.11	REVISION NO.	

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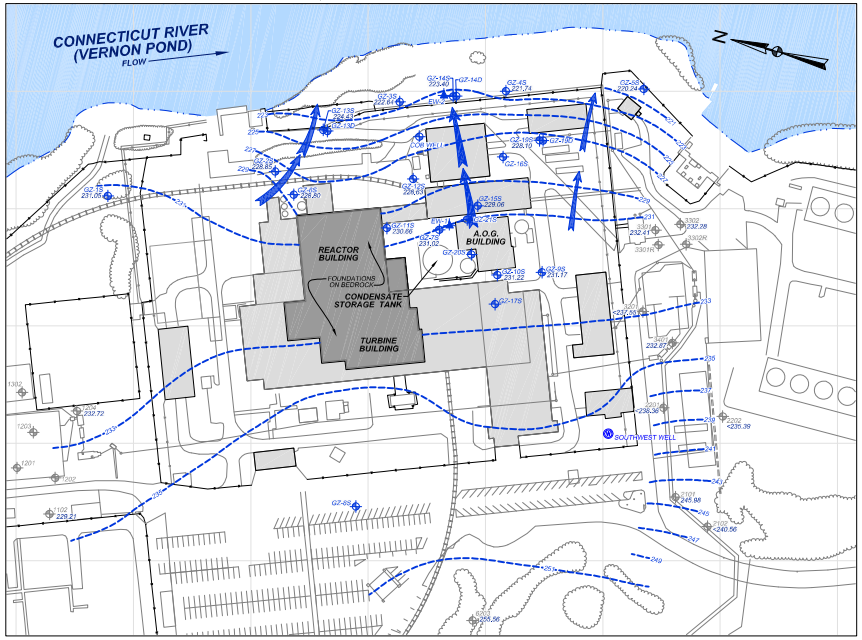
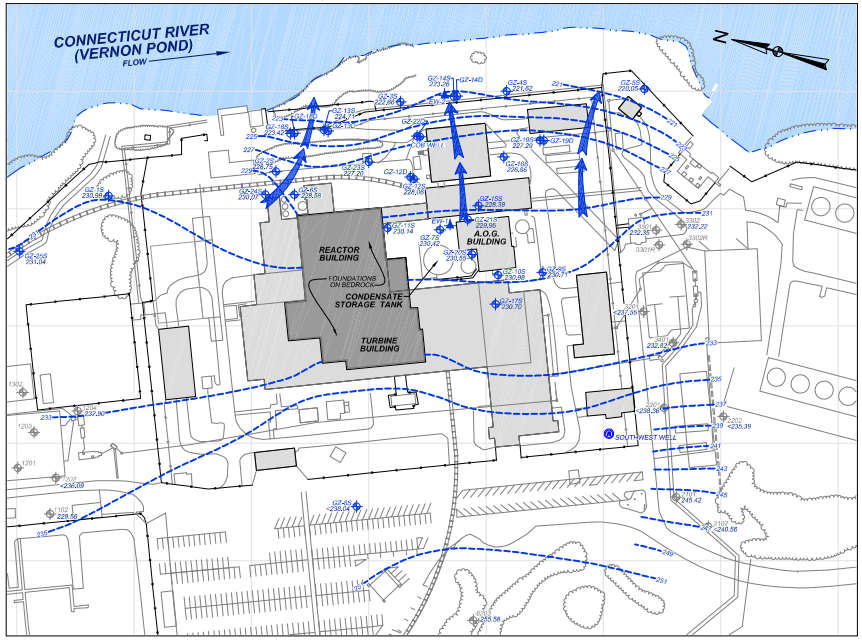
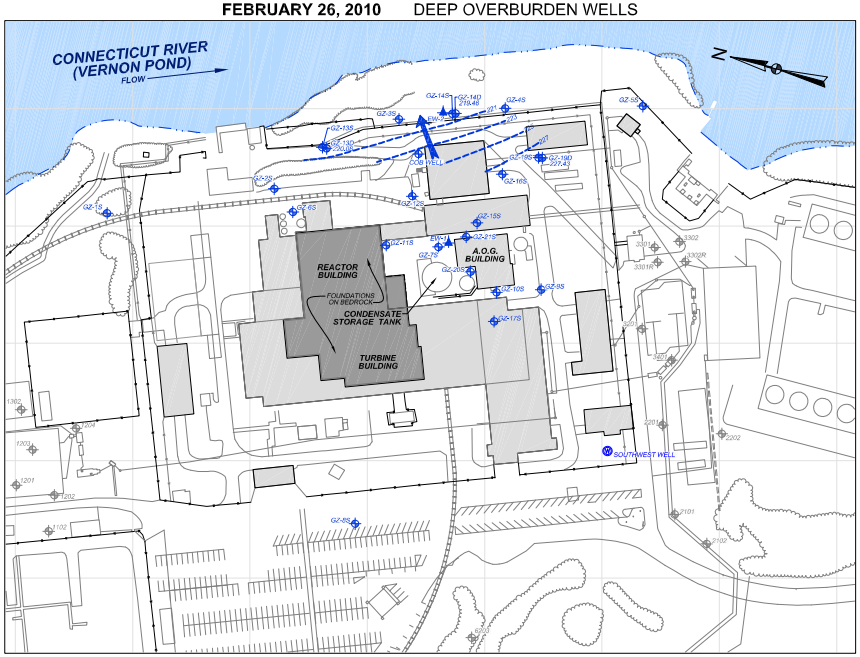
FEBRUARY 26, 2010 SHALLOW OVERBURDEN WELLS



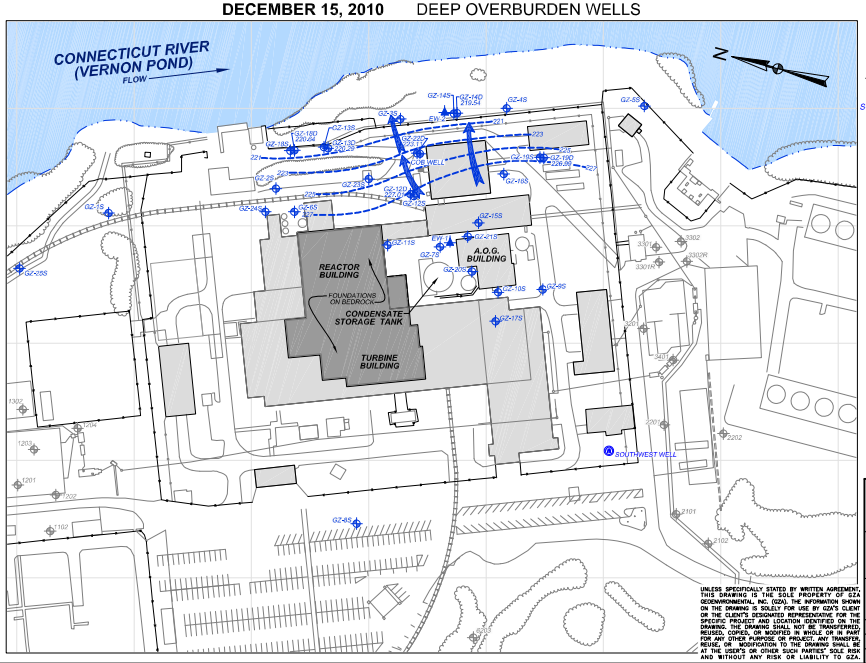
DECEMBER 15, 2010 SHALLOW OVERBURDEN WELLS



FEBRUARY 26, 2010 DEEP OVERBURDEN WELLS



DECEMBER 15, 2010 DEEP OVERBURDEN WELLS



LEGEND

- EW-2 — EXTRACTION WELL INSTALLED BY GZA
- SOUTHWEST WELL — BEDROCK WATER SUPPLY WELL
- 3201 — OTHER VERMONT YANKEE MONITORING WELL
- GZ-10S 231.22 — MONITORING WELL INSTALLED BY GZA; GROUNDWATER ELEVATION IN FEET (DATE SHOWN)
- 225 — INFERRED GROUNDWATER CONTOUR IN FEET
- INFERRED GROUNDWATER FLOW DIRECTION

NOTES:

1. GROUNDWATER CONTOURS AND FLOW DIRECTIONS INFERRED FROM GROUNDWATER ELEVATION MEASUREMENTS COLLECTED FROM WIDELY SPACED MONITORING WELLS ON **FEBRUARY 26, 2010 AND DECEMBER 15, 2010.** ACTUAL CONDITIONS MAY VARY.
2. FLUCTUATIONS IN LOCAL GROUNDWATER ELEVATIONS MAY OCCUR OVER TIME DUE TO RAINFALL, SEASONAL CHANGES IN THE RATE OF EVAPOTRANSPIRATION, RELEASE RATES FROM THE LOCAL DAM, AND OTHER VARIOUS FACTORS.
3. THE LOCATIONS AND REFERENCE ELEVATIONS OF MONITORING WELLS AND ONSITE WATER SUPPLY WELLS WERE SURVEYED BY SOUTHERN VERMONT ENGINEERING OF BRATTLEBORO VERMONT. LOCATIONS OF OTHER WATER SUPPLY WELLS BASED ON FIELD OBSERVATIONS.
4. BASE PLAN, INCLUDING SITE SURFACE TOPOGRAPHY, PROVIDED TO GZA IN ELECTRONIC FORMAT BY VERMONT YANKEE.

0 50' 100' 200' 300'
1 INCH = 100 FEET

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ENTERGY VERMONT YANKEE

VERNON, VERMONT

GROUNDWATER CONTOURS AND FLOW DIRECTIONS

PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com		PREPARED FOR: ENTERGY VERMONT YANKEE VERNON, VERMONT	
PROJ MGR: JRP	REVIEWED BY: MMS	CHECKED BY: JRP	FIGURE
DESIGNED BY: JAS	DRAWN BY: EMD	SCALE: 1" = 100'	5.3
DATE: MAY 2011	PROJECT NO.: 08.0025576.11	REVISION NO.:	

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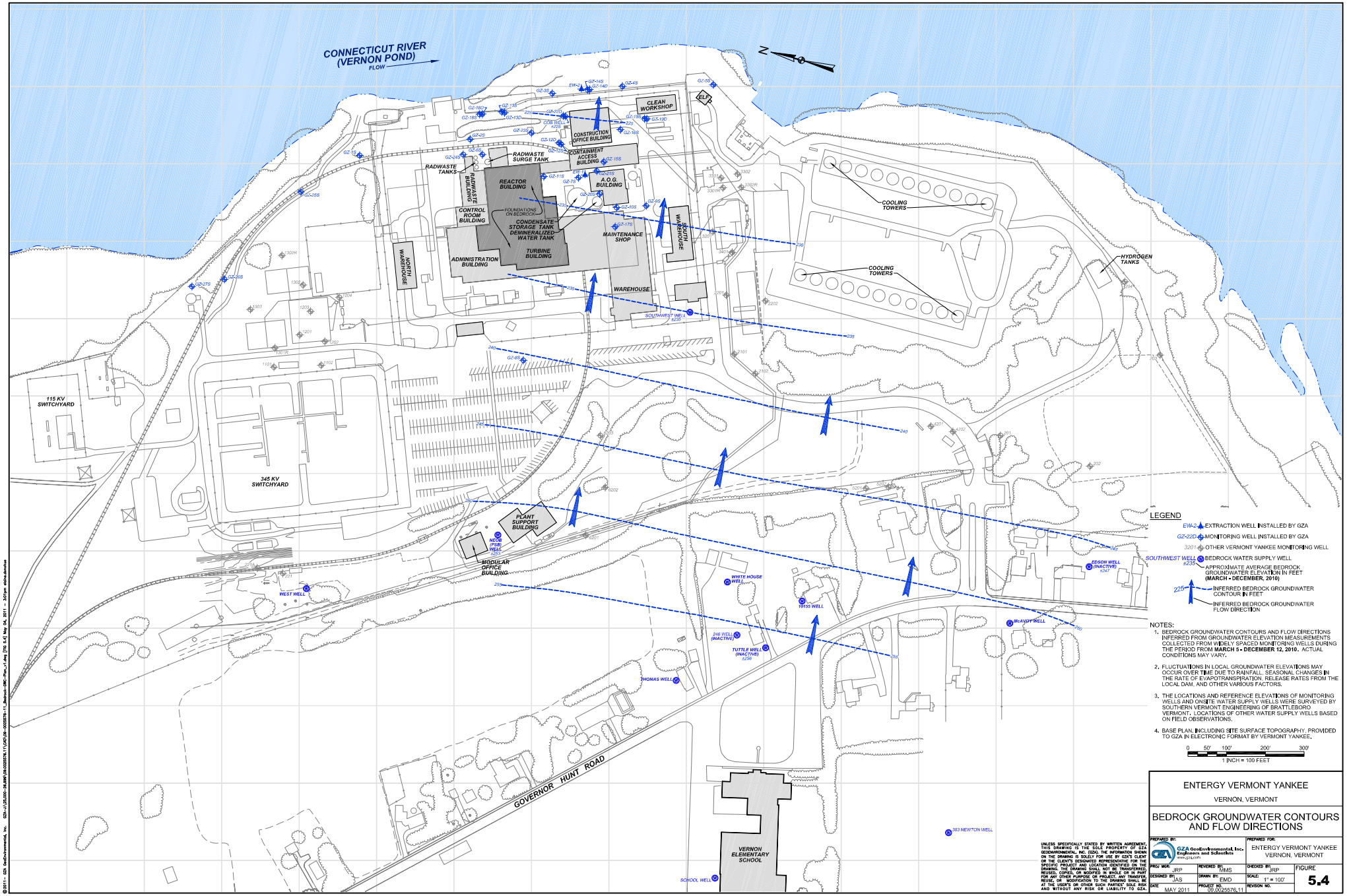

NOTES:

1. BEDROCK GROUNDWATER CONTOURS AND FLOW DIRECTIONS INFERRED FROM GROUNDWATER ELEVATION MEASUREMENTS COLLECTED FROM WIDELY SPACED MONITORING WELLS DURING THE PERIOD FROM **MARCH 5 - DECEMBER 12, 2010.** ACTUAL CONDITIONS MAY VARY.
2. FLUCTUATIONS IN LOCAL GROUNDWATER ELEVATIONS MAY OCCUR OVER TIME DUE TO RAINFALL, SEASONAL CHANGES IN THE RATE OF EVAPOTRANSPIRATION, RELEASE RATES FROM THE LOCAL DAM, AND OTHER VARIOUS FACTORS.
3. THE LOCATIONS AND REFERENCE ELEVATIONS OF MONITORING WELLS AND ONSITE WATER SUPPLY WELLS WERE SURVEYED BY SOUTHERN VERMONT ENGINEERING OF BRATTLEBORO VERMONT. LOCATIONS OF OTHER WATER SUPPLY WELLS BASED ON FIELD OBSERVATIONS.
4. BASE PLAN, INCLUDING SITE SURFACE TOPOGRAPHY, PROVIDED TO GZA IN ELECTRONIC FORMAT BY VERMONT YANKEE.

ENTERGY VERMONT YANKEE

VERNON, VERMONT

BEDROCK GROUNDWATER CONTOURS AND FLOW DIRECTIONS

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PREPARED BY: GZA GeoEnvironmental, Inc. Engineers and Scientists www.gza.com

PREPARED FOR: ENTERGY VERMONT YANKEE VERNON, VERMONT

PROJ MGR.	REVIEWED BY:	CHECKED BY:	FIGURE
JRP	TMS	JRP	5.4
DESIGNED BY: JAS	DRAWN BY: EMD	SCALE: 1" = 100'	
DATE: MAY 2011	PROJECT NO. 08.0025576.11	REVISION NO.	

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APPENDIX C

List of Standard Operating Procedures

Vermont Yankee Environmental Site Investigation Standard Operating Procedures (SOPs)

Haley & Aldrich, Inc. Field SOPs

- OP 1002: Drilling Safety
- OP 1003: Utility Clearance
- OP 2000: Monitoring Field Explorations
- OP 2001: Identification & Description of Soils in the Field Using Visual-Manual Methods
- OP 2002: Identification & Description of Rocks in the Field Using Visual-Manual Methods
- OP 2017: Rock Coring
- OP 2020: Groundwater Monitoring (Observation) Well Installation, Development and Abandonment
- OP 3000: General Environmental Field Procedures and Protocol
- OP 3001: Preservation and Shipment of Environmental Samples
- OP 3002: Headspace Screening Procedure
- OP 3003: Surficial Soil Sampling
- OP 3006: Procedures for Subsurface Soil Sampling for Chemical Analysis
- OP 3009: Monitoring Well Development Procedure
- OP 3012: Low Flow Groundwater Sampling
- OP 3032: Collection of Environmental Samples for PFAS Analysis

United States Environmental Protection Agency (US EPA) Laboratory Methods

- Method 8260C: Volatile Organic Compounds (VOCs)
- Method 8270D: Semi-volatile Organic Compounds (SVOCs) or Polycyclic Aromatic Hydrocarbons (PAHs)
- Methods 6010C/7471B: Total Target Analyte List (TAL) Metals
- Method 8082A: Polychlorinated Biphenyls (PCBs)
- Method 8015D: Total Petroleum Hydrocarbons (TPH)
- Method 537 (Modified): Poly- and Perfluorinated Alkyl (PFAS)
- Method 8290: Dioxins