



Sent via Email

December 17, 2024

Mr. Bryan Gamache
S.B. Collins, Inc.
54 Lower Welden St., P.O. Box 671
St. Albans, VT 05478

Re: Groundwater Monitoring Report
Wilmington Jolley
87 East Main Street
Wilmington, Vermont (Site or Property) (SMS#2021-5057)

Dear Mr. Gamache:

This letter report provides the results of a groundwater monitoring event conducted by Vermont HydroGeo, LLC (VHG) at the Wilmington Jolley, located at 87 East Main Street in Wilmington, Vermont (**Figures 1 and 2**). Work was completed in accordance with VHG's work plan and cost estimate (WP/CE) dated October 27, 2024, which was approved by Ms. Noelle Stroik of the Vermont Department of Environmental Conservation (VT DEC) via email on October 29, 2024. The Petroleum Cleanup Fund (PCF) tracking number for this phase of work is 32486.

Executive Summary

Shallow subsurface petroleum contamination was first identified at the Site in September 2021 during the replacement of subsurface piping and sumps for the current gasoline underground storage tanks (USTs). Subsequently, an Initial Site Investigation (ISI) was conducted, and three monitoring wells (MW-1, MW-2, and MW-3) were installed to evaluate impacts to the shallow overburden aquifer. Three additional monitoring wells (MW-4, MW-5, and MW-6) were installed during a Supplemental Site Investigation (SSI) in spring 2023. The current monitoring well network is sufficient to evaluate contaminant impacts to the shallow overburden aquifer in the UST area.

During the ISI, MTBE was detected at a concentration of 4.5 µg/L in the sample collected from monitoring well MW-2. During the SSI, MTBE was detected at concentrations of 3.0

µg/L and 5.7 µg/L in the samples collected from monitoring wells MW-1 and MW-2, respectively. In November 2024, MTBE was detected at concentrations of 2.1 µg/L and 5.0 µg/L in the samples collected from monitoring wells MW-1 and MW-2, respectively. MTBE concentrations at these monitoring wells appear stable and are below the VGES of 11 µg/L. No other target petroleum VOCs were detected above the laboratory detection limits in any of the samples collected from the Site monitoring wells during the three monitoring events conducted to date. These data suggest the impact to shallow groundwater is limited in magnitude and extent.

No sensitive receptors appear to be significantly impacted or at potential risk.

The Property appears to be eligible for a Site Management Activities Completed (SMAC) designation once the Site monitoring wells are properly abandoned.

1.0 Site Description and History

The Property is 0.9 acres located in a mixed residential and commercial setting at 87 East Main Street (VT Route 9) in Wilmington, Vermont at a latitude of 42.86549° N and longitude of 72.86437 ° W (see **Appendix A, Area Map**). The Site is bound to the north by VT Route 9, to the east by a vacant lot, to the south a wooded area with residences, and to the west by Beaver Brook. The Property and UST systems are owned by S.B. Collins, Inc. Bryan Gamache is the project contact. Mr. Gamache's contact information is provided in **Table 1-1**.

Table 1-1. Site Contact Information

Name	Address	Phone Number	Email Address
Bryan Gamache	54 Lower Welden St., P.O. Box 671 St. Albans, VT 05478	(802) 527-0116	bgamache@sbcjolley.com

A convenience store which retails gasoline operates at the Site. One structure, constructed on a full basement with concrete foundation walls and slab, is located on Site. The majority of the surface cover surrounding the building consists of asphalt. The Property is relatively flat. The nearest surface water body is Beaver Brook, located about 150 feet west of the gasoline USTs at its closet point. A small wetland, which appears to receive stormwater runoff from a portion of the eastern parking lot, is located about 60 feet south of the gasoline USTs.

The Site and nearby properties are served by municipal water and sewer.

Two gasoline USTs are located on the east side of the store:

- UST #2000-1 (8,000-gallon unleaded gasoline); and
- UST #2000-2 (15,000-gallon unleaded gasoline).

The gasoline fuel dispensers are located in the northern portion of the Site. A 2,000-gallon #2 heating oil UST (UST #2000-3) is also located on the east side of Site building, near the gasoline USTs.

On September 15, 2021, VHG conducted an environmental assessment during the replacement of subsurface piping and sumps for the two gasoline USTs. The results of the environmental assessment included the following:

- Shallow soils consisted of pea stone and fine to coarse sand and gravel fill materials, with low moisture content. Groundwater was not encountered to the maximum exploratory depth of 3 feet below ground surface (bgs).
- Photoionization detector (PID) headspace readings ranging from 3.5 to 800 parts per million volume / volume (ppm v/v) were recorded on fill materials around the sump for UST #2000-1 at about 3 feet bgs; the highest readings were recorded on the south side of the sump beneath insulation board that was placed on top of the UST (**Figure 1**). A PID reading of 10 ppm v/v was recorded at 2.5 feet bgs from a sample collected beneath the fill pipe for UST #2000-1.
- PID headspace readings ranging from 0.4 to 3.2 ppm v/v were recorded on fill materials around the sump for UST #2000-1 at about 3 feet bgs. PID readings of 162 ppm v/v and 254 ppm v/v were recorded at 2.5 and 3 feet bgs, respectively, from samples collected beneath the fill pipe for UST #2000-2 (**Figure 1**).
- PID readings ranging from 0.0 to 0.6 ppm v/v were recorded on soil samples collected at about 1.5 feet bgs beneath the former fuel dispensers (**Figure 1**).

The Property was subsequently listed as an active hazardous waste site (SMS #2021-5057), and the VT DEC requested that SB Collins, Inc. conduct an ISI at the Property.

VHG conducted the ISI in summer 2022. Three monitoring wells were installed (MW-1, MW-2, and MW-3) and subsequently sampled and analyzed for volatile organic compounds (VOCs). Methyl tert-butyl ether (MTBE) was detected at a concentration of 4.5 micrograms per Liter ($\mu\text{g}/\text{L}$) in the sample collected from monitoring well MW-2, which is below the Vermont Groundwater Enforcement Standard (VGES) of 11 $\mu\text{g}/\text{L}$; no other target petroleum VOCs were detected above the laboratory detection limits in any of the samples collected from the Site monitoring wells. However, hydraulic head data from the August 6, 2022 monitoring event suggested none of the Site monitoring wells were located hydraulically downgradient of the former sump for gasoline UST #2002-1 or the former fill pipe for gasoline UST #2002-2, where the highest PID readings were detected on shallow fill materials during the piping upgrade. The absence of monitoring wells in this area to evaluate potential

impact to the shallow overburden aquifer was a significant data gap, and VHG recommended installing three additional monitoring wells.

VHG conducted an SSI in spring 2023, which included the installation of three additional monitoring wells (MW-4, MW-5, and MW-6). During the SSI, MTBE was detected at concentrations of 3.0 µg/L and 5.7 µg/L in the samples collected from monitoring wells MW-1 and MW-2, respectively. No other target petroleum VOCs were detected above the laboratory detection limits. Based on these results, VHG recommended that an additional Site-wide groundwater monitoring event be conducted.

2.0 Work Completed

2.1 Groundwater Monitoring

On November 24, 2024, VHG collected groundwater samples from monitoring wells MW-1, MW-2, MW-3, MW-4, MW-5, and MW-6. Prior to purging these wells, liquid levels were measured using an electronic interface probe.

Monitoring wells were purged and sampled using a peristaltic pump and dedicated polyethylene and silicone tubing, after purging at least three well volumes. Purge water was discharged to the ground surface in the vicinity of the respective wells.

VHG acquire quality assurance / quality control (QA/QC) samples appropriate to meet the data quality objectives for the Site, including:

- 1 - Trip Blank; and
- 1 - Duplicate sample (from MW-3).

Following collection, all samples were placed in an ice-filled cooler and transported under a chain-of-custody to Endyne, Inc., of Williston, Vermont, and subsequently analyzed for target petroleum VOCs by EPA Method 8021B.

3.0 Results

3.1 Hydraulic Observations

On November 24, 2024, depth-to-water measurements across the Site ranged from 10.00 feet below top-of-casing (BTOC) at MW-1 to 10.79 feet BTOC at MW-5. Calculated relative water-table elevations ranged from 86.59 feet in MW-5 to 87.24 feet in monitoring well MW-1 (**Table 3-1**).

Table 3-1. Groundwater Elevation Data: November 24, 2024

Well I.D.	Top-of-Casing Elevation (feet)	Depth-to-Water (feet BTOC)	Groundwater Elevation (feet)
MW-1	97.24	10.00	87.24
MW-2	97.32	10.30	87.02
MW-3	97.29	10.30	86.99
MW-4	97.21	10.24	86.97
MW-5	97.38	10.79	86.59
MW-6	97.49	10.68	86.81

Note:

BTOC = Below Top-of-Casing

Assuming groundwater flow is perpendicular to equipotential hydraulic-head contours (**Figure 3**), overall shallow groundwater flow in the overburden aquifer was generally to the southwest, with a shallow hydraulic gradient of about 0.004 feet/foot in the UST area, increasing to about 0.014 feet/foot in the area downgradient.

3.2 Contaminant Distribution

3.2.1 Groundwater

Analytical results are provided on **Table 3-2** and **Figure 4**. The laboratory report is provided in **Appendix B**.

Table 3-2. Groundwater Analytical Results: November 24, 2024

Sample Location	Total Target VOCs	MTBE	Benzene	Toluene	Ethylbenzene	Total Xylenes	1,3,5 TMB	1,2,4 TMB	1,2,3 TMB	Total TMBs	Naphthalene
Groundwater											
MW-1	<u>2.1</u>	<u>2.1</u>	<u>0.5</u>	<u>1.0</u>	<u>1.0</u>	<u>2.0</u>	<u>1.0</u>	<u>1.0</u>	<u>1.0</u>	<u>1.0</u>	<u>0.5</u>
MW-2	<u>5.0</u>	<u>5.0</u>	<u>0.5</u>	<u>1.0</u>	<u>1.0</u>	<u>2.0</u>	<u>1.0</u>	<u>1.0</u>	<u>1.0</u>	<u>1.0</u>	<u>0.5</u>
MW-3	<u>2.0</u>	<u>2.0</u>	<u>0.5</u>	<u>1.0</u>	<u>1.0</u>	<u>2.0</u>	<u>1.0</u>	<u>1.0</u>	<u>1.0</u>	<u>1.0</u>	<u>0.5</u>
MW-4	<u>2.0</u>	<u>2.0</u>	<u>0.5</u>	<u>1.0</u>	<u>1.0</u>	<u>2.0</u>	<u>1.0</u>	<u>1.0</u>	<u>1.0</u>	<u>1.0</u>	<u>0.5</u>
MW-5	<u>2.0</u>	<u>2.0</u>	<u>0.5</u>	<u>1.0</u>	<u>1.0</u>	<u>2.0</u>	<u>1.0</u>	<u>1.0</u>	<u>1.0</u>	<u>1.0</u>	<u>0.5</u>
MW-6	<u>2.0</u>	<u>2.0</u>	<u>0.5</u>	<u>1.0</u>	<u>1.0</u>	<u>2.0</u>	<u>1.0</u>	<u>1.0</u>	<u>1.0</u>	<u>1.0</u>	<u>0.5</u>
QA/QC											
MW-3	<u>2.0</u>	<u>2.0</u>	<u>0.5</u>	<u>1.0</u>	<u>1.0</u>	<u>2.0</u>	<u>1.0</u>	<u>1.0</u>	<u>1.0</u>	<u>1.0</u>	<u>0.5</u>
Dup	<u>2.0</u>	<u>2.0</u>	<u>0.5</u>	<u>1.0</u>	<u>1.0</u>	<u>2.0</u>	<u>1.0</u>	<u>1.0</u>	<u>1.0</u>	<u>1.0</u>	<u>0.5</u>
RPD	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>	<u>0.0</u>
Trip Blank	ND	<u>2.0</u>	<u>0.5</u>	<u>1.0</u>	<u>1.0</u>	<u>2.0</u>	<u>1.0</u>	<u>1.0</u>	<u>1.0</u>	<u>1.0</u>	<u>0.5</u>
VGES	--	<u>11</u>	<u>5</u>	<u>1000</u>	<u>700</u>	<u>10000</u>	--			<u>23</u>	<u>0.5</u>

Notes:

Results reported in µg/L.

VGES = Vermont Groundwater Enforcement Standard.

Underlined values indicate the laboratory detection limit that the respective compound was not detected above.

MTBE was detected at concentrations of 2.1 µg/L and 5.0 µg/L in the samples collected from monitoring wells MW-1 and MW-2, respectively; these concentrations are below the VGES of 11 µg/L. No other target petroleum VOCs were detected above the laboratory detection limits in any of the samples collected from the Site monitoring wells.

No VOCs were detected in the trip blank.

4.0 Conceptual Site Model

VHG developed an updated conceptual site model (CSM) based on available data. A CSM is a set of working hypotheses which describe key aspects of the problem(s) at a site. As with any hypothesis, the CSM is not conclusive and may require testing to arrive at desired levels of certainty. The CSM includes discussion of Site geology/hydrogeology, how contaminants of concern were released at the Site, their transport pathways and fate mechanisms, as well as exposure routes for both ecological and human receptors based on current Site use.

Time-series graphs for monitoring wells MW-1 and MW-2, the only wells where a VOC has been detected to date, are provided in **Appendix C**.

Geology/Hydrogeology

The surficial geology in the area of the Site is mapped as glacial outwash, described as horizontally bedded glaciofluvial gravel. During the investigations to date, in general, fine to coarse sand (and varying amounts of fine to coarse gravel), with interbedded fine sand layers, were encountered to the maximum exploratory depth of 15 feet bgs. Pea stone was present in the upper 5 feet bgs at MW-2.

The primary bedrock lithology is mapped as granofels; schist is mapped as a secondary rock type. Bedrock was not encountered at the Site to the maximum exploratory depth of 15 feet bgs.

During the investigations to date, the water table across the Site was generally present between about 10 to 11 feet bgs, and overall shallow groundwater flow in the overburden aquifer was generally to the southwest, with a shallow hydraulic gradient of about 0.004 feet/foot in the UST area, increasing to about 0.014 feet/foot in the area downgradient (**Figure 3**). There may be further seasonal variations in groundwater flow direction. The seasonal range of water table fluctuation is currently unknown. Given the proximity of the wetland and stream there is likely an upward hydraulic flow component at the Site. The hydraulic conductivity (K) of the overburden aquifer has not been quantified through Site-specific testing; however, based on soil texture, K values are likely relatively high. Groundwater flow velocities have not been quantified to date.

Underground utilities at the Site are likely above the water table; as such, these utilities do not likely influence shallow groundwater flow in the area.

Contaminant Distribution/Fate and Transport

In September 2021, shallow subsurface petroleum contamination was identified at the Site during the replacement of subsurface piping and sumps for the current gasoline USTs. The highest PID readings were discovered around the fill pipe for UST #2002-2 and sump for UST #2002-1 (**Figure 1**). The volume and age of the releases are unknown.

Gasoline is comprised of hundreds of individual compounds. These compounds are typically readily sorbed to soil and organic matter, have a relatively low aqueous solubility, and are biodegradable (under both aerobic and anaerobic conditions). In general, once released to the subsurface, petroleum hydrocarbons (e.g. gasoline) can partition into four phases: 1) vapor (i.e. soil gas), 2) aqueous (dissolved in pore water or groundwater), 3) sorbed (to soil minerals and organic matter), and 4) remain as light non-aqueous phase liquid (LNAPL), either residual or mobile. The phase partitioning and migration of petroleum hydrocarbons, once released to the subsurface, depends on several factors, including: the volume and rate of the release, the physical and chemical properties of the individual hydrocarbon compounds, and the physical and chemical properties of the media that the hydrocarbons were released into.

At the Wilmington Jolley Site, gasoline was released to shallow pea stone beneath the fill pipes and sumps of the USTs. Given their relatively low organic matter content, there was likely little sorption to these fill materials. There was likely some partitioning to the vapor phase as the LNAPL migrated downward through the vadose zone under the influence of gravity and around the sides of the USTs, and some of the LNAPL may have “snapped off” leaving behind globules and ganglia within the pore spaces. If the LNAPL came into contact with groundwater in the overburden aquifer, individual compounds within the LNAPL would have partitioned into the aqueous phase based on the solubility of the compound and its mole fraction within the LNAPL, generating a dissolved-phase plume of hydrocarbon constituents.

During the ISI, MTBE was detected at a concentration of 4.5 µg/L in the sample collected from monitoring well MW-2. During the SSI, MTBE was detected at concentrations of 3.0 µg/L and 5.7 µg/L in the samples collected from monitoring wells MW-1 and MW-2, respectively. In November 2024, MTBE was detected at concentrations of 2.1 µg/L and 5.0 µg/L in the samples collected from monitoring wells MW-1 and MW-2, respectively (**Figure 4**). MTBE concentrations at these monitoring wells appear stable and are below the VGES of 11 µg/L. No other target petroleum VOCs were detected above the laboratory detection limits in any of the samples collected from the Site monitoring wells during the three monitoring events conducted to date.

Monitoring well MW-2 is located about 15 feet hydraulically downgradient of the former sump for gasoline UST #2002-2, where a peak PID reading of 3.2 ppm v/v was detected on fill materials at 3 feet bgs during the sump replacement in September 2021 (**Figure 1**); these data suggest that gasoline releases around this sump have impacted shallow groundwater, but the impact is limited in magnitude and extent. MW-1 appears to be located hydraulically upgradient of the known release areas; as such, it is unclear at this time why MTBE was detected in this well.

Monitoring wells MW-4, MW-5, and MW-6 appear to be located hydraulically downgradient of the former sump for gasoline UST #2002-1 and the former fill pipe for gasoline UST #2002-2 (**Figure 3**), where peak PID readings of 800 ppm v/v and 254 ppm v/v, respectively, were detected on fill materials at 3 feet bgs during the piping upgrade in September 2021 (**Figure 1**). No VOCs were detected in these wells during the SSI or recent monitoring event in November 2024, suggesting the gasoline releases around the sump and fill pipe have not impacted shallow groundwater, or if they have, the impact is limited to the UST area.

Sensitive Receptor Evaluation

An evaluation of the risk to sensitive receptors is provided below.

Soil - The shallow soil contamination identified does not likely present a significant risk for direct contact exposure given it is \geq two feet bgs and was capped with concrete after the UST piping and sumps were replaced. However, any future intrusive work in these areas could result in exposure.

Shallow Groundwater - MTBE has been detected in water-table monitoring wells MW-1 and MW-2, but at concentrations below the VGES. No other VOCs have been detected. As such, shallow groundwater does not appear to be significantly impacted.

Surface Water - The nearest surface water body is a small wetland located about 60 feet south of the gasoline USTs. Beaver Brook is located about 150 feet west of the gasoline USTs at its closest point. These surface water bodies do not appear to be at risk.

Indoor Air - The risk of vapor intrusion (VI) to the on-Site building appears relatively low given that no VOCs were detected at concentrations above VI Standards in monitoring wells MW-2 and MW-3, which are located between the release areas and the building.

Water Supplies - The Site and neighboring properties are served by municipal water. No water supplies appear to be at risk.

Underground Utilities - No underground utilities (e.g. water and sewer) appear to be at risk.

5.0 Conclusions and Recommendations

Based on the results of the November 2024 monitoring event and previous investigations, VHG has drawn the following conclusions:

- In September 2021, shallow subsurface petroleum contamination was identified at the Site during the replacement of subsurface piping and sumps for the current gasoline USTs. The highest PID readings were discovered around the fill pipe for UST #2002-2 and sump for UST #2002-1, where peak PID readings of 254 ppm v/v and 800 ppm v/v, respectively, were detected on fill materials at 3 feet bgs (**Figure 1**). The volume and age of the releases are unknown.
- The current monitoring well array is sufficient to evaluate contaminant impacts to the shallow overburden aquifer in the UST area.
- During the ISI, MTBE was detected at a concentration of 4.5 µg/L in the sample collected from monitoring well MW-2. During the SSI, MTBE was detected at concentrations of 3.0 µg/L and 5.7 µg/L in the samples collected from monitoring wells MW-1 and MW-2, respectively. In November 2024, MTBE was detected at concentrations of 2.1 µg/L and 5.0 µg/L in the samples collected from monitoring wells MW-1 and MW-2, respectively. MTBE concentrations at these monitoring wells appear stable and are below the VGES of 11 µg/L. No other target petroleum VOCs were detected above the laboratory detection limits in any of the samples collected from the Site monitoring wells during the three monitoring events conducted to date. These data suggest the impact to shallow groundwater is limited in magnitude and extent.
- No sensitive receptors appear to be significantly impacted or at potential risk.

Given the above conclusions, VHG makes the following recommendations:

- The Property appears to be eligible for a Site Management Activities Completed (SMAC) designation once the Site monitoring wells are properly abandoned.
 - A work plan and cost estimate should be prepared for review and approval from VT DEC prior to implementation of additional field activities.
-

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. Should you have any questions, please do not hesitate to contact me at (802) 485-9466 or eric.vhg@tds.net.

Yours truly,
Vermont HydroGeo, LLC

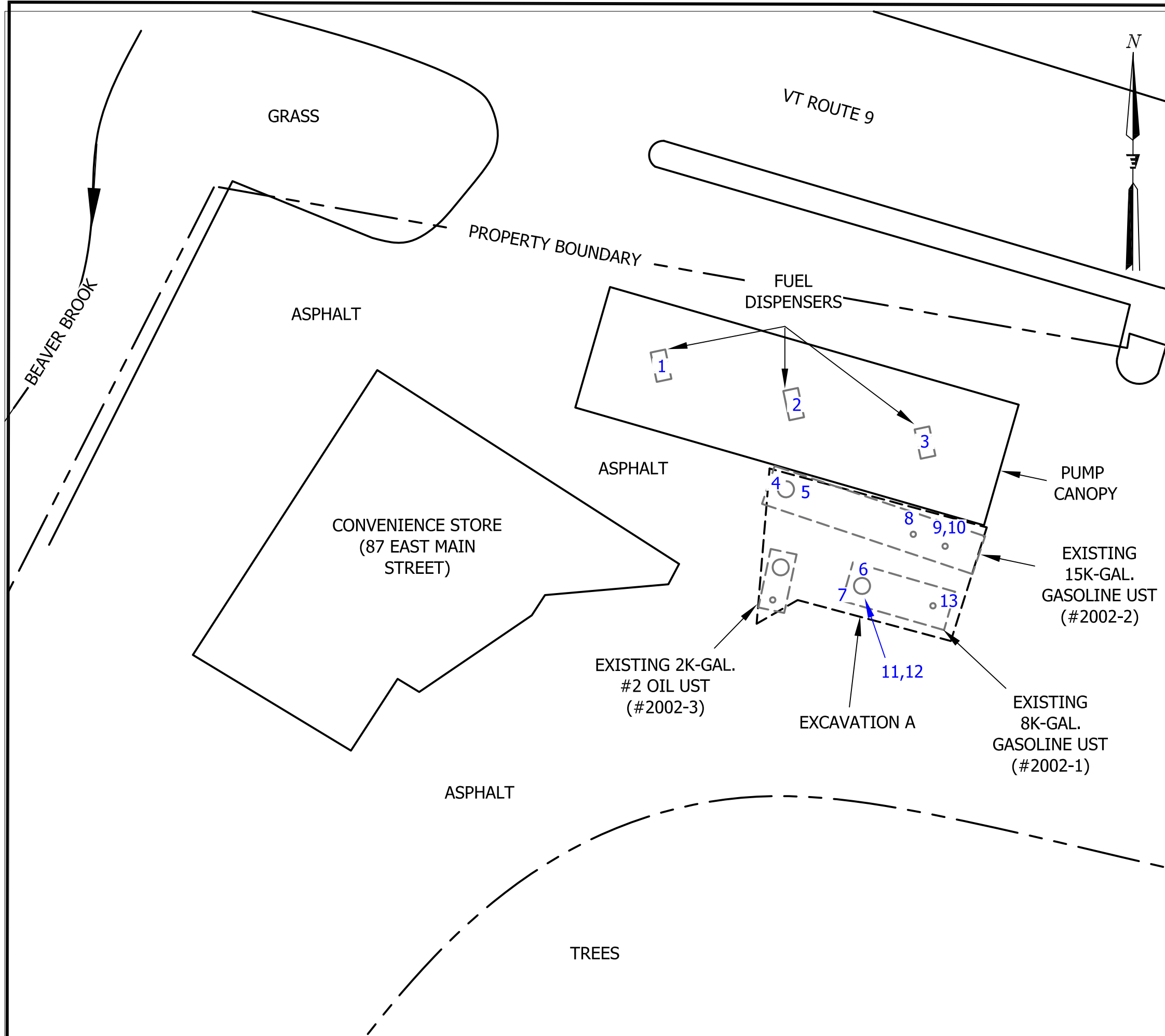
Eric Swiech

Eric J. Swiech, P.G.
Principal Hydrogeologist

Figures
Appendices

cc: Ms. Noelle Stroik, VT DEC

FIGURES



NOTES:

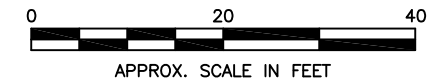
BASE MAP CREATED FROM GOOGLE EARTH AERIAL IMAGE DATED 9/18/14 AND FIELD MEASUREMENTS.

ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE. NO CLAIM IS MADE TO ACCURACY.

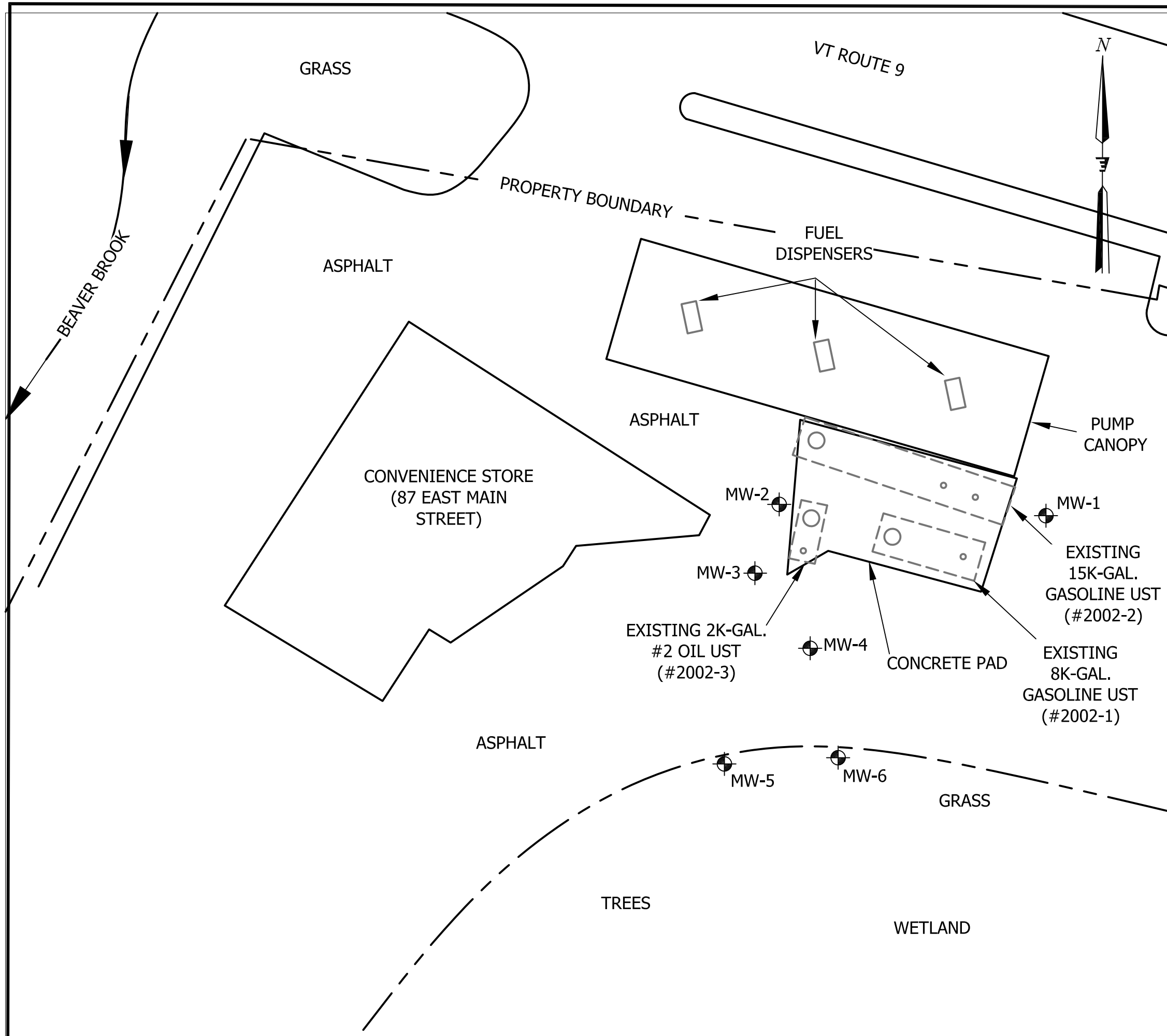
PID READINGS RECORDED IN PPM V/V. DEPTH MEASUREMENTS RECORDED IN FEET BELOW GROUND SURFACE.

PID READINGS RECORDED ON 9/15/21.

PID SCREENING RESULTS		
LOCATION	DEPTH	PID READING
1	1.5	0.0
2	1.5	0.4
3	1.5	0.6
4	3	0.4
5	3	3.2
6	3	7.2
7	3	3.5
8	3	7.1
9	2.5	162
10	3	254
11	3	472
12	3	800
13	2.5	10



TITLE: SITE PLAN WITH PID SCREENING RESULTS		FIGURE NO.: 1
PROJECT:	JOLLEY WILMINGTON	
DATE:	10/21/21	
DRAWN BY: EJS		

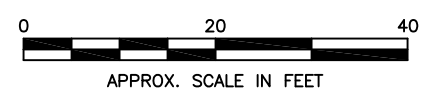


LEGEND

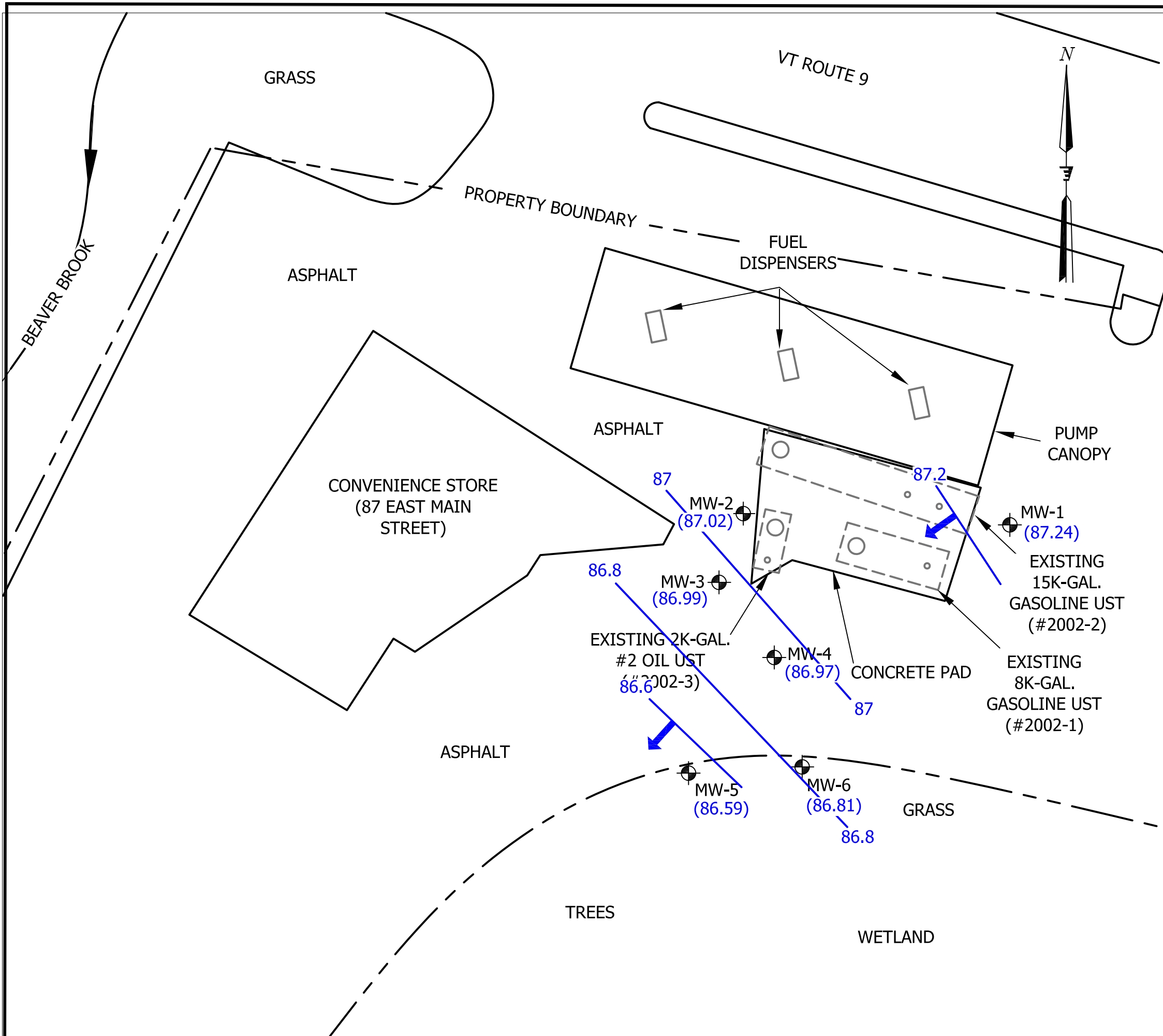
⊕ MONITORING WELL

NOTES:


BASE MAP CREATED FROM GOOGLE EARTH AERIAL IMAGE DATED 9/18/14 AND FIELD MEASUREMENTS.
 ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE. NO CLAIM IS MADE TO ACCURACY.



TITLE: SITE PLAN WITH MONITORING WELLS	
PROJECT: JOLLEY WILMINGTON	FIGURE NO.: 2
DATE: 6/29/23	DRAWN BY: EJS



LEGEND

-  MONITORING WELL
- (87.24) WATER-TABLE ELEVATION
- / WATER-TABLE ELEVATION CONTOUR

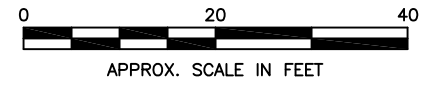
NOTES:

BASE MAP CREATED FROM GOOGLE EARTH AERIAL IMAGE DATED 9/18/14 AND FIELD MEASUREMENTS.

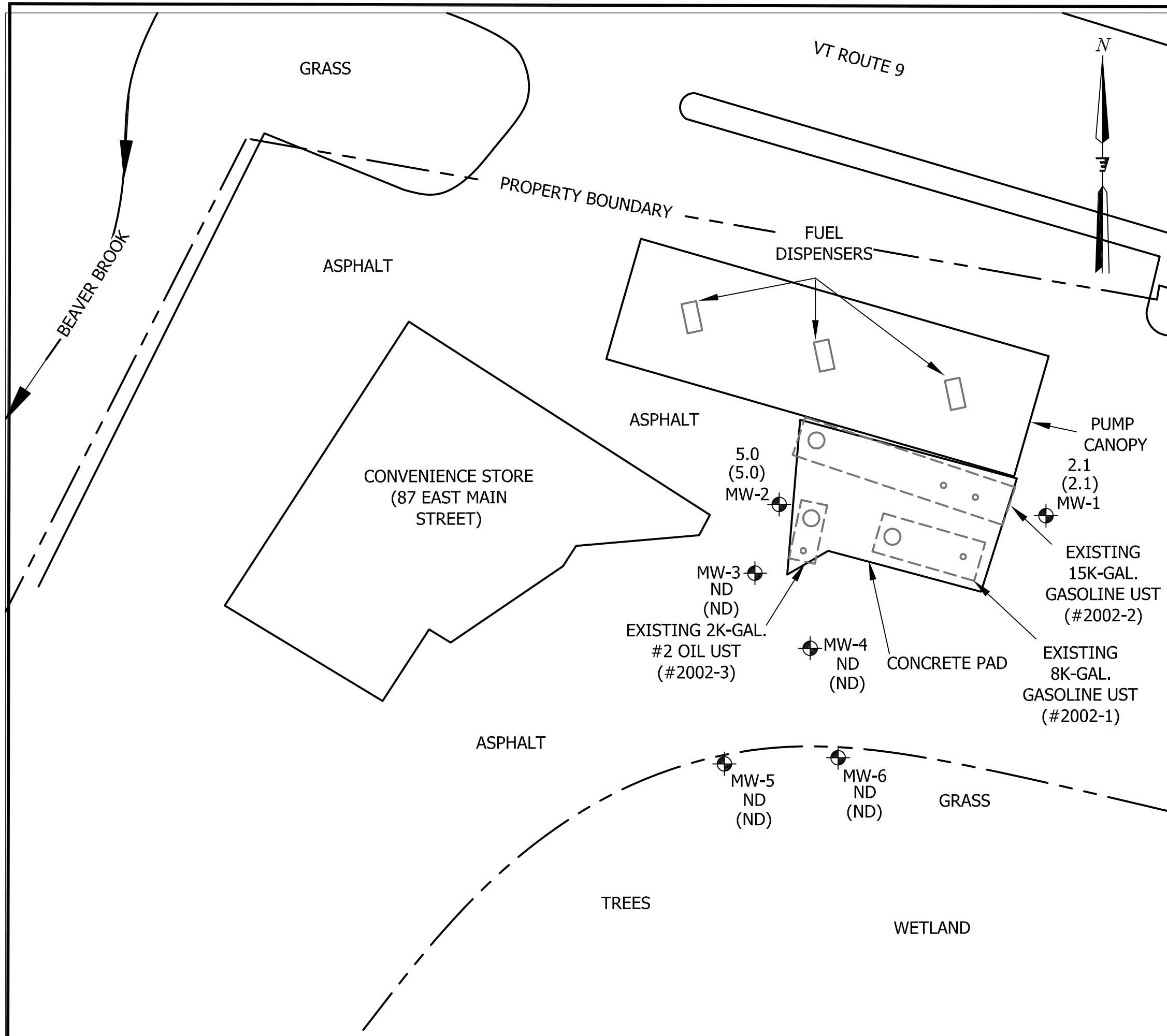
ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE. NO CLAIM IS MADE TO ACCURACY.

ELEVATION VALUES REPORTED IN FEET RELATIVE TO AN ARBITRARY SITE DATUM OF 100.00 FEET.


BLUE ARROWS REPRESENT APPARENT SHALLOW GROUNDWATER FLOW DIRECTION.



TITLE: WATER-TABLE ELEVATION MAP: 11/24/24	
PROJECT: JOLLEY WILMINGTON	FIGURE NO.: 3
DATE: 12/16/24	DRAWN BY: EJS



LEGEND

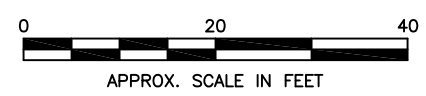
-  MONITORING WELL
- 5.0 DISSOLVED MTBE CONCENTRATION
- (5.0) TOTAL DISSOLVED VOCs CONCENTRATION

NOTES:

BASE MAP CREATED FROM GOOGLE EARTH AERIAL IMAGE DATED 9/18/14 AND FIELD MEASUREMENTS.

ALL LOCATIONS AND DIMENSIONS ARE APPROXIMATE. NO CLAIM IS MADE TO ACCURACY. THIS PLAN SHOULD NOT BE USED FOR CONSTRUCTION PURPOSES, PROPERTY LINE DETERMINATION, EXACT LOCATION OF SITE FEATURES ETC.

CONCENTRATIONS REPORTED IN MICROGRAMS PER LITER.



TITLE: CONTAMINANT DISTRIBUTION MAP: 11/24/24

PROJECT: JOLLEY WILMINGTON

FIGURE NO.:

DATE: 12/16/24 DRAWN BY: EJS

4

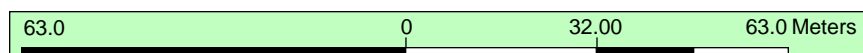
APPENDIX A



LEGEND

- Landfills**
 - OPERATING
 - CLOSED
- Land Use Restrictions**
 - Class IV GW Reclass
 - Class VI GW Reclass
 - Deed Restriction
 - Easement
 - Land Record Notice
 - Other
- Hazardous Site
- Hazardous Waste Generators
- Brownfields
- Salvage Yard
- Underground Storage Tank (working)
- Solid Waste Management Districts
- Parcels (standardized)
- Town Boundary

1: 1,246
1in = 104 ft.
1cm = 12 meters



DISCLAIMER: This map is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. ANR and the State of Vermont make no representations of any kind, including but not limited to, the warranties of merchantability, or fitness for a particular use, nor are any such warranties to be implied with respect to the data on this map.

THIS MAP IS NOT TO BE USED FOR NAVIGATION

NOTES

Map created using ANR's Natural Resources Atlas

APPENDIX B



Laboratory Report

Vermont HydroGeo	100905
2113 Stony Brook Rd	
Northfield, VT 05663	
Atten: Eric Swiech	

PROJECT: JW Rev
WORK ORDER: **2411-38850**
DATE RECEIVED: November 26, 2024
DATE REPORTED: December 09, 2024
SAMPLER: Eric

Enclosed please find the results of the analyses performed for the samples referenced on the attached chain of custody. All required method quality control elements including instrument calibration were performed in accordance with method requirements and determined to be acceptable unless otherwise noted.

The column labeled Lab/Tech in the accompanying report denotes the laboratory facility where the testing was performed and the technician who conducted the assay. A "W" designates the Williston, VT lab under NELAC certification ELAP 11263; "R" designates the Lebanon, NH facility under certification NH 2037 and "N" the Plattsburgh, NY lab under certification ELAP 11892. "Sub" indicates the testing was performed by a subcontracted laboratory. The accreditation status of the subcontracted lab is referenced in the corresponding NELAC and Qual fields.

The NELAC column also denotes the accreditation status of each laboratory for each reported parameter. "A" indicates the referenced laboratory is NELAC accredited for the parameter reported. "N" indicates the laboratory is not accredited. "U" indicates that NELAC does not offer accreditation for that parameter in that specific matrix. Test results denoted with an "A" meet all National Environmental Laboratory Accreditation Program requirements except where denoted by pertinent data qualifiers. Test results are representative of the samples as they were received at the laboratory

Endyne, Inc. warrants, to the best of its knowledge and belief, the accuracy of the analytical test results contained in this report, but makes no other warranty, expressed or implied, especially no warranties of merchantability or fitness for a particular purpose.

Reviewed by:

Harry B. Locker, Ph.D.
Laboratory Director

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160 James Brown Dr., Williston, VT 05495
Ph 802-879-4333 Fax 802-879-7103

56 Etna Road, Lebanon, NH 03766
Ph 603-678-4891 Fax 603-678-4893



CLIENT: Vermont HydroGeo
 PROJECT: JW Rev
 REPORT DATE: 12/9/2024

WORK ORDER: 2411-38850
 DATE RECEIVED: 11/26/2024

TEST METHOD: EPA 8021B

001	Site: MW-1	Date Sampled: 11/24/24 11:05	Analysis Date: 12/5/24	W TRP
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Parameter	Result	Unit	Nelac	Qual	Parameter	Result	Unit	Nelac	Qual
Methyl-t-butyl ether (MTBE)	2.1	ug/L	N		Benzene	< 0.5	ug/L	N	
Toluene	< 1.0	ug/L	N		Ethylbenzene	< 1.0	ug/L	N	
Xylenes, Total	< 2.0	ug/L	N		1,3,5-Trimethylbenzene	< 1.0	ug/L	N	
1,2,4-Trimethylbenzene	< 1.0	ug/L	N		1,2,3-Trimethylbenzene	< 1.0	ug/L	U	
Naphthalene	< 0.5	ug/L	N		Surr. 1 (Bromobenzene)	103	%	N	
Unidentified Peaks	0		N						

TEST METHOD: EPA 8021B

002	Site: MW-2	Date Sampled: 11/24/24 11:15	Analysis Date: 12/5/24	W TRP
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Parameter	Result	Unit	Nelac	Qual	Parameter	Result	Unit	Nelac	Qual
Methyl-t-butyl ether (MTBE)	5.0	ug/L	N		Benzene	< 0.5	ug/L	N	
Toluene	< 1.0	ug/L	N		Ethylbenzene	< 1.0	ug/L	N	
Xylenes, Total	< 2.0	ug/L	N		1,3,5-Trimethylbenzene	< 1.0	ug/L	N	
1,2,4-Trimethylbenzene	< 1.0	ug/L	N		1,2,3-Trimethylbenzene	< 1.0	ug/L	U	
Naphthalene	< 0.5	ug/L	N		Surr. 1 (Bromobenzene)	101	%	N	
Unidentified Peaks	0		N						

TEST METHOD: EPA 8021B

003	Site: MW-3	Date Sampled: 11/24/24 11:30	Analysis Date: 12/5/24	W TRP
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Parameter	Result	Unit	Nelac	Qual	Parameter	Result	Unit	Nelac	Qual
Methyl-t-butyl ether (MTBE)	< 2.0	ug/L	N		Benzene	< 0.5	ug/L	N	
Toluene	< 1.0	ug/L	N		Ethylbenzene	< 1.0	ug/L	N	
Xylenes, Total	< 2.0	ug/L	N		1,3,5-Trimethylbenzene	< 1.0	ug/L	N	
1,2,4-Trimethylbenzene	< 1.0	ug/L	N		1,2,3-Trimethylbenzene	< 1.0	ug/L	U	
Naphthalene	< 0.5	ug/L	N		Surr. 1 (Bromobenzene)	102	%	N	
Unidentified Peaks	0		N						

TEST METHOD: EPA 8021B

004	Site: MW-4	Date Sampled: 11/24/24 11:40	Analysis Date: 12/5/24	W TRP
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Parameter	Result	Unit	Nelac	Qual	Parameter	Result	Unit	Nelac	Qual
Methyl-t-butyl ether (MTBE)	< 2.0	ug/L	N		Benzene	< 0.5	ug/L	N	
Toluene	< 1.0	ug/L	N		Ethylbenzene	< 1.0	ug/L	N	
Xylenes, Total	< 2.0	ug/L	N		1,3,5-Trimethylbenzene	< 1.0	ug/L	N	
1,2,4-Trimethylbenzene	< 1.0	ug/L	N		1,2,3-Trimethylbenzene	< 1.0	ug/L	U	
Naphthalene	< 0.5	ug/L	N		Surr. 1 (Bromobenzene)	100	%	N	
Unidentified Peaks	0		N						

TEST METHOD: EPA 8021B

005	Site: MW-5	Date Sampled: 11/24/24 12:00	Analysis Date: 12/5/24	W TRP
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Parameter	Result	Unit	Nelac	Qual	Parameter	Result	Unit	Nelac	Qual
Methyl-t-butyl ether (MTBE)	< 2.0	ug/L	N		Benzene	< 0.5	ug/L	N	
Toluene	< 1.0	ug/L	N		Ethylbenzene	< 1.0	ug/L	N	
Xylenes, Total	< 2.0	ug/L	N		1,3,5-Trimethylbenzene	< 1.0	ug/L	N	
1,2,4-Trimethylbenzene	< 1.0	ug/L	N		1,2,3-Trimethylbenzene	< 1.0	ug/L	U	
Naphthalene	< 0.5	ug/L	N		Surr. 1 (Bromobenzene)	102	%	N	
Unidentified Peaks	0		N						

CLIENT: Vermont HydroGeo
 PROJECT: JW Rev
 REPORT DATE: 12/9/2024

WORK ORDER: 2411-38850
 DATE RECEIVED: 11/26/2024

TEST METHOD: EPA 8021B

006 Site: MW-6 Date Sampled: 11/24/24 11:50 Analysis Date: 12/5/24 W TRP

Parameter	Result	Unit	Nelac	Qual	Parameter	Result	Unit	Nelac	Qual
Methyl-t-butyl ether (MTBE)	< 2.0	ug/L	N		Benzene	< 0.5	ug/L	N	
Toluene	< 1.0	ug/L	N		Ethylbenzene	< 1.0	ug/L	N	
Xylenes, Total	< 2.0	ug/L	N		1,3,5-Trimethylbenzene	< 1.0	ug/L	N	
1,2,4-Trimethylbenzene	< 1.0	ug/L	N		1,2,3-Trimethylbenzene	< 1.0	ug/L	U	
Naphthalene	< 0.5	ug/L	N		Surr. 1 (Bromobenzene)	101	%	N	
Unidentified Peaks	0		N						

TEST METHOD: EPA 8021B

007 Site: Dup Date Sampled: 11/24/24 Analysis Date: 12/5/24 W TRP

Parameter	Result	Unit	Nelac	Qual	Parameter	Result	Unit	Nelac	Qual
Methyl-t-butyl ether (MTBE)	< 2.0	ug/L	N		Benzene	< 0.5	ug/L	N	
Toluene	< 1.0	ug/L	N		Ethylbenzene	< 1.0	ug/L	N	
Xylenes, Total	< 2.0	ug/L	N		1,3,5-Trimethylbenzene	< 1.0	ug/L	N	
1,2,4-Trimethylbenzene	< 1.0	ug/L	N		1,2,3-Trimethylbenzene	< 1.0	ug/L	U	
Naphthalene	< 0.5	ug/L	N		Surr. 1 (Bromobenzene)	100	%	N	
Unidentified Peaks	0		N						

TEST METHOD: EPA 8021B

008 Site: TB Date Sampled: 11/24/24 12:10 Analysis Date: 12/5/24 W TRP

Parameter	Result	Unit	Nelac	Qual	Parameter	Result	Unit	Nelac	Qual
Methyl-t-butyl ether (MTBE)	< 2.0	ug/L	N		Benzene	< 0.5	ug/L	N	
Toluene	< 1.0	ug/L	N		Ethylbenzene	< 1.0	ug/L	N	
Xylenes, Total	< 2.0	ug/L	N		1,3,5-Trimethylbenzene	< 1.0	ug/L	N	
1,2,4-Trimethylbenzene	< 1.0	ug/L	N		1,2,3-Trimethylbenzene	< 1.0	ug/L	U	
Naphthalene	< 0.5	ug/L	N		Surr. 1 (Bromobenzene)	101	%	N	
Unidentified Peaks	0		N						

Report Summary of Qualifiers and Notes

REV: This report in its entirety has been amended in reference to the original report released 12/6/24. The following change(s) were made on 12/9/24 by ET: Corrected the account to match the coc.



160 James Brown Dr. Williston VT 05445
PH 802-879-4333

Chain-of-Custody-Record

*Required Fields

Do Not use this form for WSID Samples or Residential Drinking Water Samples

PO#

*Project Name:

JW

EMAIL

ERIC.VHIGG@TDS.NET

*Company Name:

VHIGG

*Sampler Name:

ERIC

*Phone #

477-3126

*Mailing Address: 213 STONY BROOK RD

NORSTFIELD VT 05663

*Billing Address:

←

*State of Origin: VT NY NH Other

*Sample Location

Please Print Clearly

*Matrix

GRAB

COMP

*Date/Time Sampled

Container Volume, Ex. 16oz, 1/2 gal.

Sample Preservation

*Analysis Required: Enter Number from Choices Below

Field Results/Remarks

MW-1

W

X

11-24-24 1105

40 mL

4CL

19

MW-2

✓

✓

11/15

✓

✓

✓

MW-3

✓

✓

11/30

✓

✓

✓

MW-4

✓

✓

11/40

✓

✓

✓

MW-5

✓

✓

1206

✓

✓

✓

MW-6

✓

✓

11/50

✓

✓

✓

DUP

✓

✓

12/10

✓

✓

✓

TR

✓

✓

✓

✓

✓

✓

Yanasse Hansen Brustlin, Inc.
JW



2411-38850

*Relinquished By:

[Signature]

Date/Time 11-26-24

Received By:

Date/Time

Received By:

Date/Time

11/26/24 1450

1. pH

16. Total Solids

17. E. coli

18. COD

19. VOC 8021B VT21-W Low

20. 8260

21. F.O.G

22. 8015 GRO

23. 8015 DRO

24. Full

25. Full 8270 827-W

2. Chloride

7. TP

8. TDP

9. BOD

10. Alkalinity

11. Total Solids

12. TSS

13. TDS

14. Turbidity

15. Conductivity

16. Sulfate

3. Ammonia N

8. TDP

9. BOD

10. Alkalinity

11. Total Solids

12. TSS

13. TDS

14. Turbidity

15. Conductivity

16. Sulfate

17. E. coli

4. Nitrate N

9. BOD

10. Alkalinity

11. Total Solids

12. TSS

13. TDS

14. Turbidity

15. Conductivity

16. Sulfate

17. E. coli

18. COD

5. Nitrite N

10. Alkalinity

11. Total Solids

12. TSS

13. TDS

14. Turbidity

15. Conductivity

16. Sulfate

17. E. coli

18. COD

19. VOC 8021B VT21-W Low

36. Metals Total or Diss. Ag Al As B Ba Be Ca Cd Co Cr Cu Fe Hg K Mg Mn Mo Na Ni Pb Sb Se Sn Tl U V Zn

37. TCLP (circle) Metals, Volatiles, Semi-volatiles, Pesticides, Herbicides

38. PFAS (circle) Drinking Water Non-potable Solid

39. Other:

31. PP13 Metals PP13-W

32. Total RCRA 8 Metals RCRA8-W

33. Conductivity

34. Ignitability

35. Reactivity

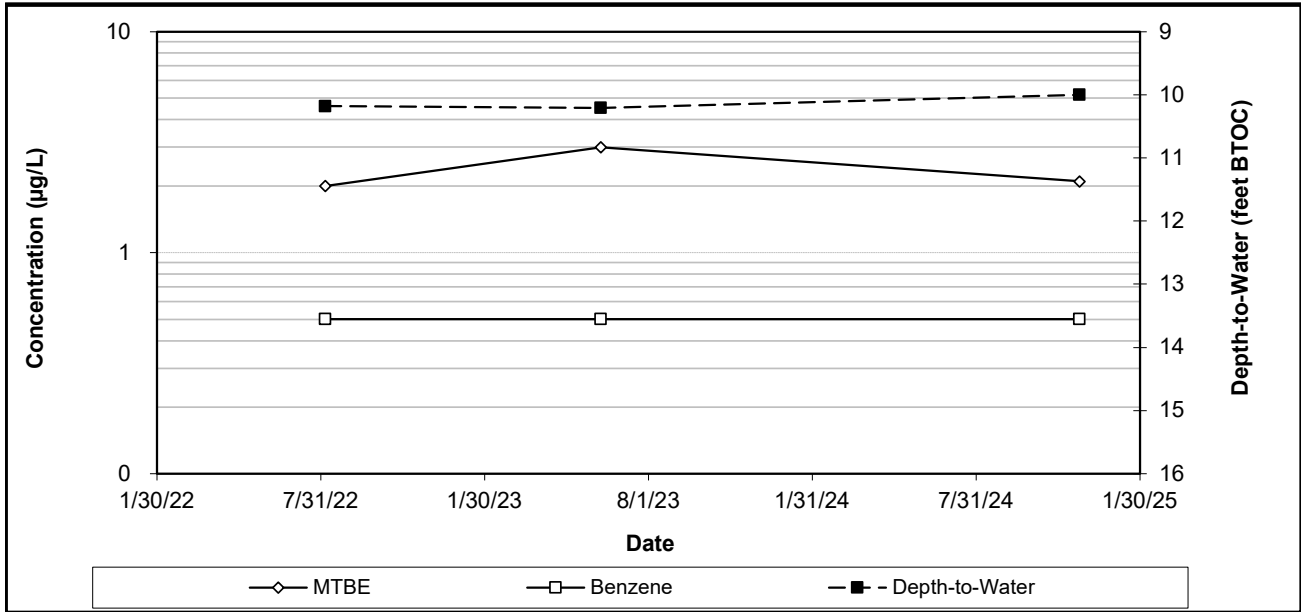
Lab Use Only Below

Delivered on ice Y N

APPENDIX C

**Graph 1. MW-1
VOC Concentrations in Groundwater Over Time**

Jolley Wilmington
Wilmington, Vermont

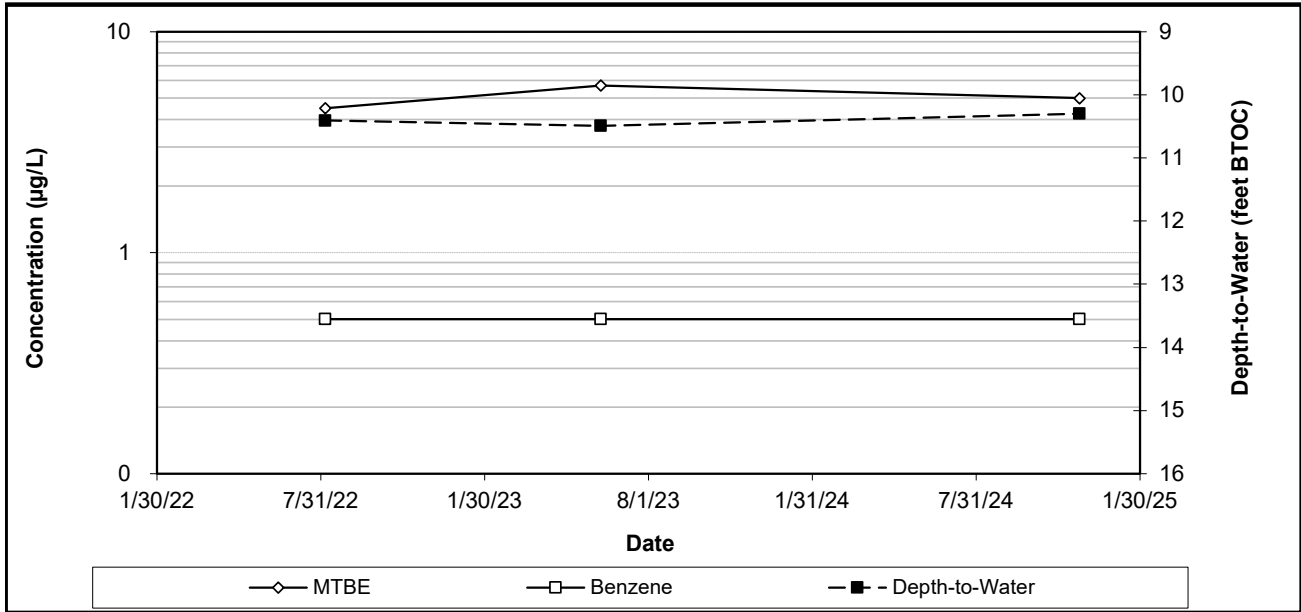


Date	Total VOCs	MTBE	Benzene	Toluene	Ethyl benzene	Xylenes	Total TMBs	Naphthalene	Depth-to-Water
8/6/22	<u>2.0</u>	<u>2.0</u>	<u>0.5</u>	<u>1.0</u>	<u>1.0</u>	<u>2.0</u>	<u>1.0</u>	<u>0.5</u>	10.18
6/9/23	3.0	3.0	<u>0.5</u>	<u>1.0</u>	<u>1.0</u>	<u>2.0</u>	<u>1.0</u>	<u>0.5</u>	10.21
11/24/24	2.1	2.1	<u>0.5</u>	<u>1.0</u>	<u>1.0</u>	<u>2.0</u>	<u>1.0</u>	<u>0.5</u>	10.00
VGES	---	11	5	1,000	700	10,000	23	0.5	---

Notes: Results reported in micrograms per liter (µg/L)
 Bold values highlight detected concentrations.
 Underlined values are the detection limits; these values are used for graphing.
 VGES - Vermont Groundwater Enforcement Standards
 MTBE - Methyl tert-butyl ether
 Total TMBs = 1,2,4 TMB and 1,3,5 TMB, plus 1,2,3 TMB.
 Shaded areas denote VGES exceedance.

**Graph 2. MW-2
VOC Concentrations in Groundwater Over Time**

Jolley Wilmington
Wilmington, Vermont



Date	Total VOCs	MTBE	Benzene	Toluene	Ethyl benzene	Xylenes	Total TMBs	Naphthalene	Depth-to-Water
8/6/22	4.5	4.5	<u>0.5</u>	<u>1.0</u>	<u>1.0</u>	<u>2.0</u>	<u>1.0</u>	<u>0.5</u>	10.41
6/9/23	5.7	5.7	<u>0.5</u>	<u>1.0</u>	<u>1.0</u>	<u>2.0</u>	<u>1.0</u>	<u>0.5</u>	10.49
11/24/24	5.0	5.0	<u>0.5</u>	<u>1.0</u>	<u>1.0</u>	<u>2.0</u>	<u>1.0</u>	<u>0.5</u>	10.30
VGES	---	11	5	1,000	700	10,000	23	0.5	---

Notes: Results reported in micrograms per liter (µg/L)
 Bold values highlight detected concentrations.
 Underlined values are the detection limits; these values are used for graphing.
 VGES - Vermont Groundwater Enforcement Standards
 MTBE - Methyl tert-butyl ether
 Total TMBs = 1,2,4 TMB and 1,3,5 TMB, plus 1,2,3 TMB.
 Shaded areas denote VGES exceedance.