Groundwater & Environmental Services, Inc.

63 E Main Street, Suite 3
Pawling, New York 12564

T. 866.839.5195

July 17, 2019

Mr. Michael Squire
Division of Environmental Remediation, Remedial Bureau C
New York State Department of Environmental Conservation
625 Broadway
Albany, New York 12233

Re: Periodic Review Report – July 2018 to July 2019
1-45 Orangetown Shopping Center
Orangeburg, New York
Site #C344066

Dear Mr. Squire:

Enclosed is the *Periodic Progress Report* for the above referenced site prepared by Groundwater & Environmental Services, Inc. (GES) on behalf of UB Orangeburg, LLC. This document is required as an element of the remedial program at the Orangeburg (Orangetown) Shopping Center, located in the Town of Orangetown (Orangeburg), County of Rockland, New York under the New York State (NYS) Brownfield Cleanup Program (BCP) administered by the New York State Department of Environmental Conservation (NYSDEC).

If you have any questions or comments regarding this submittal, please contact me at (866) 839-5195, extension 3839.

Sincerely,
Groundwater & Environmental Services, Inc.

Michael DeGloria Michael DeGloria 2019.07.16 16:29:01 -04'00'

Michael DeGloria, P.G.
Principal Project Manager

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UB Orangeburg, LLC

Periodic Review Report (Part 1)

UB Orangeburg

1-45 Orangeburg Shopping Center

NYSDEC Site Number C344066

July 2019

Version 1

Periodic Review Report

UB Orangeburg
1-45 Orangeburg Shopping Center

Prepared for:
UB Orangeburg, LLC
321 Railroad Avenue
Greenwich, CT 06830

Prepared by:
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GES Project:
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Date:
July 17, 2019

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Principal Project Manager

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NE Region Engineering Manager

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Acronyms

BAS	bio-augmentation treatment system
BCA	Brownfield Cleanup Agreement
BCP	Brownfield Cleanup Program
COC	constituent of concern
DO	dissolved oxygen
DUSR	data usability summary report
ECs	engineering controls
EE	Environmental Easement
EPA	Environmental Protection Agency
GES	Groundwater & Environmental Services, Inc.
GWQS	groundwater quality standards
HVAC	heating, venting, and air conditioning
ICs	institutional controls
i.w.	inches of water column
JLJ	JLJ Management Company
mg/L	milligrams per liter
mV	millivolts
NYS	New York State
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OM&M	operation, maintenance, and monitoring
ORP	oxidation-reduction potential
RAWP	Remedial Action Work Plan
SGS	SGS/Accutest Laboratories of Dayton, New Jersey
SMP	Site Management Plan
SSDS	sub-slab depressurization system
SVI	soil vapor intrusion
TOC	total organic carbon
µg/l	micrograms per liter
VOC	volatile organic compound

1 Executive Summary

This document is required as an element of the remedial program at the Orangeburg (Orangetown) Shopping Center, located in the Town of Orangetown (Orangeburg), County of Rockland, New York (hereinafter referred to as the "Site") under the New York State (NYS) Brownfield Cleanup Program (BCP) administered by the New York State Department of Environmental Conservation (NYSDEC). The Site remediation activities have been conducted in accordance with the Brownfield Cleanup Agreement (BCA) Index #A3-0563-0906, site #C344066. JLJ Management Company (hereinafter referred to as the "JLJ") entered into a BCA with the NYSDEC in January of 2007 to remediate a 1.33-acre portion of the approximately 11 acre property containing chlorinated solvent compounds above NYSDEC standards. The subject property was purchased from JLJ by UB Orangeburg, LLC in 2012. On March 28, 2012, the Certificate of Completion was officially transferred from JLJ to UB Orangeburg, LLC.

GES continues to implement the remedial activities outlined in the Site Management Plan (SMP) revised in October 2017. Groundwater concentrations of tetrachloroethene, trichloroethene, cis-1,2-dichloroethene, trans-1,2-dichloroethene, 1,1-dichloroethene, vinyl chloride, and ethene (constituents of concern [COCs]) in well MW-5 have fluctuated over the monitoring period but indicate degradation of chlorinated compounds through the chlorinated solvents reductive transformation pathway.

No major non-compliance issues have been identified during the monitoring period of June 17, 2018 to June 17, 2019.

2 Site Overview

The approximate geographical coordinates for the Site are 41 degrees, 2 minutes, 41.6 seconds North (Latitude) by 73 degrees, 57 minutes, 10.4 seconds West (Longitude). The Site is comprised of one (1) parcel (Section, Lot & Block: 74.10-67-1) that covers an area of approximately 11 acres. Included are the following: a Site Location Map (**Figure 1**) for the general property location, a Site Map (**Figure 2**) showing the current key Site features at the subject Site, and a Detail Site Map (**Figure 3**) showing the current locations of active injection and monitoring well points near building #2.

Contamination was first observed at the Site after a damaged sewer line exiting the former Sparkle Cleaners Dry Cleaners was identified. The first remedial activity consisted of source removal activities and the repair of the sewer line in January of 2009. After completion of the remedial work described in Construction Completion Report #1: Source Removal (CCR-1), residual contamination was left in the subsurface at the Site, which is hereafter referred to as "remaining contamination". A SMP was prepared to manage remaining contamination until the Environmental Easement (EE) is extinguished in accordance with ECL Article 71, Title 36 (EE included as **Appendix A**). Components of the selected remedy consist of sub-slab depressurization systems (SSDSs) and a bio-augmented injection gallery.

2.1 Sub-Slab Depressurization Systems

Because of the residual contaminated subsurface soil and contaminated groundwater, the SSDSs were designed to mitigate potential vapor intrusion from residual chlorinated volatile organic compound (VOC) contamination into the southern portion of building #2, which businesses include: former Sparkle Cleaners (currently a Verizon Store), former Deli Spot (currently TZ Liquors), and New China House. The SSDS was configured to create a negative pressure (relative to the indoor environment) within the area beneath the concrete floor slabs of the businesses within the southern portion of building #2, thereby minimizing the potential for migration of contaminant vapor into the indoor air of the tenant spaces.

The system was installed between February and May 2010, and it was activated in May 2010. The system as originally designed did not achieve the performance standard and it was subsequently modified. Additional system performance testing was completed in June 2010 and a modified plan was prepared and approved by the NYSDEC in August 2010. Modifications were implemented between August and September 2010. The system was re-started with additional blowers in place on September 29, 2010 and operation was verified with another performance (vacuum response) test. Late in 2010, it was observed that ongoing heating, venting, and air conditioning (HVAC) issues in the building potentially affected system performance. These issues were the result of foundation leaking and back draft issues associated with furnaces and other fans. These issues were resolved in early 2011. The system was re-inspected in March to verify resolution of the issues. In late April 2011, three vapor-monitoring points were replaced in the New China Restaurant and another system check was performed. This test verified that the system achieved measured vacuum greater than 0.0025 inches of water column (i.w) across the slab in the three tenant spaces.

The NYSDEC approved the temporary shutdown of the SSDSs in August 2015 and the decommissioning of two (2) of the three (3) SSDS's (former Deli Spot and Sparkle Cleaners) in January 2017 following additional soil vapor intrusion testing which verified mitigation of the soil vapor intrusion pathway as defined by the New York State Department of Health *Guidance for Evaluating Soil Vapor Intrusion in the State of New York*, dated October 2006 and updates to Soil Vapor/Indoor Air Decision Matrices, dated May 2017. SSDS removal activities were completed only at the former Deli Spot tenant space in April 2017. A Sub-Slab Depressurization Configuration map is included as **Figure 4**.

As requested by the NYSDEC, sub-slab and indoor air testing was conducted at the three (3) tenant spaces during the 2016/2017, 2017/2018, and 2018/2019 heating season for the purpose of monitoring rebound following the shutdown of the SSDSs. Based on the results of the consecutive sampling events, a final event was proposed to be conducted during the 2019/2020 heating season at the former Sparkle Cleaner tenant space (sample locations VP-5 and VP-6 only). If any potential impacts are identified, then conditions will be re-evaluated and monitoring will continue as described in the SMP.

2.2 Bio-Augmentation Treatment System

Because of the presence of contaminated groundwater and residual soil contamination under building #2, a bio-augmentation treatment system (BAS) was designed. This treatment promotes in-situ microbial degradation of contaminants in saturated soil and groundwater. Addition of a bio-stimulant (molasses) to subsurface soil and groundwater acts as an electron donor that stimulates metabolic reduction of chlorinated VOCs to ethene via microorganisms that have been detected as being present at the Site, as have bacteria of the genus Dehalococcoides (in MW-5 and MW-6) and Dehalobacter (in MW-5).

Bio-augmentation injection points and manifold piping were installed after the source removal excavation between February and April 2010. A batch injection tank connects to the manifold via manual gate valves to direct electron donor solution (a 10% molasses solution) and control flow to the injection points. Additional injection points were installed during April and May of 2012 and January of 2014 in accordance with the Remedial Action Work Plan (RAWP). Baseline and post injection sampling (from a network of monitoring wells), monitoring, and laboratory analysis provide the means to monitor treatment effectiveness. The initial rounds of injections were completed in May, July, and November 2010. The first round of treatment indicated bio-augmentation was enhancing biodegradation and dechlorination of the contaminants. The results also suggested that additional injections of electron donor solution would enhance treatment. Twelve (12) subsequent injection events were conducted at the Site between August 2012 and September 2016.

Bio-augmentation monitoring and treatment of groundwater will continue, as determined by the NYSDEC, until residual groundwater concentrations are found to be consistently below NYSDEC standards or have become asymptotic at an acceptable level over an extended period. This treatment will continue until permission to discontinue is granted in writing by the NYSDEC. If groundwater contaminant concentrations become asymptotic at a level that is not acceptable to the NYSDEC, additional source removal, treatment, and/or control measures will be evaluated.

Conditions that warrant discontinuing the bio-augmentation treatment system include contaminant concentrations in groundwater that: (1) reach levels that are consistently below groundwater quality standards (GWQS), (2) have become asymptotic to a low level over an extended period of time as accepted by the NYSDEC, or (3) the NYSDEC has determined that the bio-augmentation treatment system has reached the limit of its effectiveness. This assessment will be based in part on post-remediation contaminant levels in groundwater collected from monitoring wells located throughout the Site. Monitoring wells formerly associated with the bio-augmentation system (MW-A, MW-B, MW-C, MW-D, and MW-F) were abandoned in August 2017 following approval from the NYSDEC. The existing systems will remain in place and operational until permission to discontinue their use is granted in writing by the NYSDEC.

3 Evaluation of Remedy Performance and Effectiveness

3.1 Sub-Slab Depressurization System Evaluation

Quarterly operation, maintenance, and monitoring (OM&M) visits were not conducted during the reporting period due to the temporary shutdown of the remaining SSDSs at the former Sparkle Cleaners and the New China House.

3.2 Bio-Augmentation System Evaluation

Baseline and post-injection sampling (from a network of monitoring wells), monitoring, and laboratory analysis provide the means to monitor treatment effectiveness. Overall, 12 injection events have been completed since August 2012. A total approximate volume of 8,015 gallons of 10% molasses solution has been injected since the initiation of this remedy. The last event was conducted on September 14, 2016 utilizing injection wells IP-3, IP-4, INJ-3D, and INJ-4D.

Geochemical targets for pH and total organic carbon (TOC) concentration in the BAS monitoring network wells are established to inform decision making regarding injection frequency and quantity. The optimal geochemical target range for TOC concentrations is 50 through 500 milligrams per liter (mg/L) and a pH between 6 and 8. Bio-parameter levels were within the target range at monitoring well MW-5 during the September 2018 and March 2019 quarterly monitoring events. However, the TOC concentrations were outside of the optimal geochemical target range during the December 2018 (29.6 mg/L) and May 2019 (20.4 mg/L) quarterly monitoring events. These bio-parameters will continue to be monitored and evaluated during the 2019/2020 monitoring period, if TOC concentrations are outside of the optimal geochemical target range for two (2) consecutive monitoring events, an additional bio-augmentation event may be conducted.

Groundwater well logs updated during each quarterly sampling event are included as **Appendix B**. Please refer to **Figures 5** through **8** and **Table 1** and **2** for a summary of groundwater elevation and concentrations of the COCs at all sampled monitoring wells. **Figure 9** and **Tables 3** and **4** present the general chemistry analytical results and measured bioparameter readings including optimal geochemical target range for TOC concentrations (50 mg/L through 500 mg/L) and pH (6 to 8) at the monitoring wells. Groundwater trends observed at monitoring well MW-5 during the monitoring period are illustrated in **Figure 10**.

4 Institutional Control & Engineering Control Plan Compliance

4.1 Institutional Controls

Institutional Controls (ICs) at the Site (**Appendix C**) include compliance with the EE. The EE contains the following stipulations: no new drinking water wells can be installed and new business and residences must be connected to city water. The SMP stipulates all engineering controls (ECs) must be operated and maintained as specified in the SMP, all ECs on the controlled property must be inspected at a frequency and in a manner defined in the SMP, groundwater and other environmental monitoring must be performed as defined in this SMP, and data and

information pertinent to site management of the control property must be reported at a frequency and in a manner specified in the SMP.

During the monitoring period all ICs have been in compliance with the EE. No new drinking wells have been installed and no new businesses have been built which would require a connection to city water. All ECs have been operated and maintained as specified in the SMP or otherwise approved by the NYSDEC. ECs are inspected in accordance to the required frequency set forth by the SMP. Groundwater and other environmental monitoring have been performed as defined in the SMP. Progress reports summarizing groundwater and other environmental monitoring were submitted to the NYSDEC and the New York State Department of Health (NYSDOH) as they are completed. Approval to discontinue submittal of monthly progress reports was granted by the NYSDEC in a letter dated August 25, 2014.

Regulatory correspondences during the monitoring period are attached as **Appendix D**.

4.2 Engineering Controls

The SMP requires that three separate ECs be maintained at the Site: the SSDS, the bio-augmentation system, and the composite cover system. Maintenance and inspections of the ECs at the Site are reported to the NYSDEC and NYSDOH as they are completed.

Historically, exposure to vapor intrusion within the southern portion of building #2 was mitigated by the operation of the SSDSs. This system was comprised of extraction piping, sub-slab ventilation blowers and associated appurtenances at former Sparkle Cleaners, the former Deli Spot, and New China House tenant spaces. The SSDSs created a negative pressure which intercepted potential soil vapor from beneath the concrete floor using eight branches (SSD-1 through SSD-8) and transferred extracted vapors using in-line blowers to discharge locations outside the building (above the roof). Thirteen (13) extraction points were installed between the three (3) tenant spaces. Additional extraction points were added to each tenant space after the SSDSs was initially installed. Fifteen (15) SSD vacuum monitoring points were also installed within the three (3) tenant spaces and can be measured to verify vacuum beneath the concrete slab. A manometer was installed on the suction side of the in-line blower on each of the SSD branches to provide a visual indicator that the SSDSs were operating properly.

The SSDSs have been temporarily shut-down since August 17, 2015 following receipt of NYSDEC approval. In May 2017, following NYSDEC approval, the former Deli Spot SSDS was permanently decommissioned.

Because of the presence of contaminated groundwater and residual soil contamination under building #2, a bio-augmentation treatment system was designed. This treatment promotes in-situ microbial degradation of contaminants in saturated soil and groundwater. Addition of a molasses solution to subsurface soil and groundwater acts as an electron donor that stimulates metabolic reduction of chlorinated VOCs to ethene. Bio-augmentation injection points and manifold piping were installed after the source removal excavation between February and April 2010. An additional nine (9) nested bio-augmentation injection points and four (4) additional monitoring wells were installed between April and May of 2012 and January of 2014 in accordance with the RAWP, submitted by Kleinfelder on December 19, 2011. Details regarding the installation of

additional monitoring points and nested injection wells can be referenced in the May 2012, January 2014, and February 2014 Monthly Progress Reports, submitted to the NYSDEC.

Molasses injection events were not completed during the monitoring period. The BAS monitoring network will continue to be monitored via periodic sampling of wells during the 2019/2020 monitoring period to determine future injection frequency and quantity.

Maintenance and inspections of the composite cover system consisting of existing impermeable surfaces (concrete slabs and asphalt paving) were conducted during the monitoring period.

IC and EC certifications are provided in **Appendix C**.

5 Monitoring Plan Compliance

The Monitoring Plan describes the measures for evaluating the performance and effectiveness of the remedy to reduce or mitigate contamination at the Site, the composite cover system, and all affected Site media identified in the SMP. Monitoring results and performance evaluation of the ECs are reported to the NYSDEC and the NYSDOH as they are completed.

Components and schedule of the current monitoring plan are summarized in **Chart 1**.

Chart 1 – Monitoring/Inspection Schedule

Monitoring Program	Frequency	Matrix	Analysis
Composite Cover System	Annual (minimum) or during other (more frequent) inspections as time and conditions warrant	Soil	Visual Inspection of Cover
SSDS	Temporarily Shutdown/ Permanently Decommissioned	Soil Vapor	Negative Pressure
Bio-augmentation System	“As Needed”, if TOC concentrations are below 50 mg/L	Groundwater	Total Organic Carbon
Groundwater	Quarterly	Groundwater	Chlorinated VOCs, ethene

5.1 Composite Cover Monitoring Compliance

On May 13, 2019, the composite cover system was inspected by a qualified environmental professional. The composite cover system was determined to be intact and impervious to surface water infiltration. Surficial cracks in the asphalt parking lot in the area of the well network exist but do not expose the soil underneath. Photographs of the asphalt parking lot are provided in **Appendix E**.

Additional inspections occurred during one or more of the following activities: groundwater sampling and/or site visits.

5.2 Sub-Slab Depressurization System Monitoring Compliance

SSDSs inspections and monitoring were not conducted this year due to the temporary shutdown of the SSDSs in August 2015. SSDS removal activities were completed at the former Deli Spot tenant space in April 2017.

A SSDS Decommissioning Request was submitted to the NYSDEC and NYSDOH (the Departments) on January 3, 2017 requesting approval to decommission two (2) of the three (3) tenant spaces at the Orangetown Shopping Center. The request to decommission the former Deli Spot and former Sparkle Cleaners tenant spaces was approved by the Departments on January 20, 2017 with a contingency to collect yearly sub-slab and indoor air samples from the three (3) tenant spaces for the next two (2) heating seasons (2017/2018 and 2018/2019).

On December 18 and 19, 2018 a Soil Vapor Intrusion (SVI) investigation was completed. Ambient air and sub slab samples were collected from the former Deli Spot, former Sparkle Cleaners, and New China House. Sample locations are illustrated on **Figure 11**. Samples were submitted to SGS/Accutest Laboratories of Dayton, New Jersey (SGS) and were analyzed for VOCs via Environmental Protection Agency (EPA) Methods VTO15NYLL and/or VTO15NYSVLL. Laboratory analytical results were compared to the NYSDOH *Guidance for Evaluating Soil Vapor Intrusion in the State of New York*, section 3.4.2, Indoor Air Matrices A, B, and C. Based on the comparison, the required remedial action for two (2) of the three (3) tenant spaces was “no further action” (former Deli Spot and New China House). However, the testing results at the former Sparkle Cleaners tenant space recommended Monitoring. Based on the results of the December 2018 SVI investigation and prior events, GES recommended one (1) additional sampling event targeting the former Sparkle Cleaner tenant space (sample locations VP-5 and VP-6 only) which was approved by the NYSDEC and NYSDOH in an email dated June 7, 2019. The SVI investigation is summarized in the *Soil Vapor Intrusion Summary* submitted to the NYSDEC in February 2019. Regulatory correspondences are attached in **Appendix D**. SVI investigation analytical results are summarized in **Table 5** and the comparison of analytical results to NYSDOH Indoor Air Matrices A, B, and C is included as **Table 6**.

5.3 Bio-Augmentation System Monitoring Compliance

Inspections and monitoring of the bio-augmentation system were completed as described in the SMP. A total of 12 injection events have been completed since August 2012. A total approximate volume of 8,015 gallons of 10% molasses solution has been injected since the initial event.

Quarterly groundwater monitoring and annual baseline sampling were completed at the Site. Monitoring wells MW-3, MW-8A, and MW-E are sampled on an annual basis and monitoring wells MW-4 and MW-5 are sampled quarterly. Updates to the groundwater sampling program were submitted as revisions to the SMP in October 2017.

Each quarter samples were submitted to SGS for the following analysis: VOCs, ethene, nitrate, iron (total, ferrous and ferric), sulfate, and/or TOC. Analytical data provided by SGS is included in **Appendix F** and are represented in **Tables 2** and **4**, and **Figures 5** through **8**. Each quarter the Category B laboratory analytical reports provided by SGS were submitted to RemVer for review

of data quality. Subsequent to the data review, RemVer provided a data usability summary report (DUSR), included in **Appendix G**.

Annual baseline sampling was completed at monitoring wells MW-3, MW-4, MW-5, MW-8A, and MW-E on March 12, 2019 and May 13, 2019. Due to insufficient water in monitoring well MW-8A during the March 2019 event, ethene, nitrate, iron (total, ferrous and ferric), sulfate, and TOC samples were collected during the May 2019 event. Analytical data provided by SGS has been included in **Appendix F**. Results from the annual baseline sampling can be referenced in **Tables 2** and **4**. TOC concentrations in the monitoring well network are graphically represented on **Figure 9**.

6 Operation, Monitoring & Maintenance Plan Compliance

The OM&M Plans describe the measures necessary to operate, monitor, and maintain the mechanical components of the remedy selected for the Site. This section has two specific OM&M plans: one for the SSDS and one for the bio-augmentation treatment system.

Annually, copies of the OM&M forms generated from field activities at the Site are placed inside the on-Site hazardous communications box. Additionally, a copy of the Sub-Slab Depressurization Operation, Monitoring, and Maintenance Plan, Bio-augmentation System Operation, Maintenance, and Monitoring Plan and manuals provided by the equipment manufacturer are stored in the hazardous communications box for reference.

6.1 Sub-Slab Depressurization OM&M Compliance

The SSDSs remained temporarily shutdown for the entire monitoring period. Due to the shutdown of the SSDSs, OM&M events were not completed this year.

6.2 Bio-Augmentation OM&M Compliance

BAS OM&M visits were completed during quarterly sampling events as described in the Bio augmentation System Operation, Maintenance, and Monitoring Plan. Each visit included the following activities to evaluate performance and operation of the system: an inspection for security issues, vandalism, system damage, equipment or conveyance malfunction, connection integrity or environmental effects, gauging of BAS monitoring well network, collection of general groundwater chemistry parameters, visual inspection of piping stub-ups and BAS monitoring well road boxes, and inspection of well pads and injection road boxes and road pads. No non-compliance issues were identified during the reporting period.

7 Conclusions and Recommendations

7.1 SMP Compliance

During this monitoring period, all requirements set forth in the SMP have been completed. ICs described in the SMP are in place and in compliance. Monitoring and OM&M of the two (2) active

ECs (composite cover and bio-augmentation system) were conducted during the monitoring period as specified in the SMP. OM&M of SSDSs have been suspended while the remaining systems are temporarily shutdown. Inspection of the composite cover system was completed at a minimum frequency of once annually. Monitoring and OM&M of the bio-augmentation system was completed on a quarterly basis during the quarterly groundwater sampling events.

7.2 Performance and Effectiveness of Remedy

7.2.1 Soil Vapor and SSDS Operation

The SSDSs have been temporarily shut-down since August 17, 2015. The NYSDEC approved the request to permanently decommission the SSDSs in the former Deli Spot and the former Sparkle Cleaners in January 2017. SSDS removal activities were completed at the former Deli Spot in May 2017. As requested by the NYSDEC, sub-slab and indoor air testing was conducted at the three (3) tenant spaces during the 2016/2017, 2017/2018, and 2018/2019 heating season for the purpose of monitoring rebound following the shutdown of the SSDSs. Based on the results of the consecutive sampling events which indicated “no further action” for all sample points at the former Deli Spot and New China House and recommended “monitoring” at the former Sparkle Cleaners, an additional event will be conducted during the 2019/2020 heating season at the former Sparkle Cleaner tenant space only (sample locations VP-5 and VP-6 only). The results of the additional sampling event will be evaluated against the Soil Vapor/Indoor Air Matrix A, B and C Matrices to propose appropriate additional actions.

The historic operation of the SSDSs have effectively reduced the soil vapor/indoor air concentrations under the subject building to action levels of “no further action” or “monitoring”.

7.2.2 Groundwater and Bio-Augmentation

Based on the most recent groundwater data from May 13, 2019, monitoring well MW-5 exhibits concentrations above GWQS for cis-1,2-dichlorethene (156 micrograms per liter [µg/L]) and vinyl chloride (224 µg/L). Decreases in concentration of trichloroethene and cis-1,2-dichloroethene and increases in concentration of vinyl chloride when comparing the June 2018 and May 2019 quarterly sampling events suggest the degradation of chlorinated VOCs. The total VOCs, based on laboratory method 8260, decreased by 55% between the June 2018 and May 2019 quarterly sampling events. In addition, monitoring well MW-5 exhibits generally low oxidation reduction potential (ORP) levels over the monitoring period, ranging from +8.2 to -61.2 millivolts (mV). This indicates that favorable reducing conditions have been maintained during the reporting period within the targeted treatment area even though the TOC concentrations was within the target geochemical range (50 mg/L to 500 mg/L) in monitoring well MW-5 during the September 2018 and March 2019 sampling events, but outside the target zone during the December 2018 and May 2019 sampling events.

Groundwater & Environmental Services, Inc. (GES) evaluated VOC concentrations in groundwater over the annual monitoring period. The results of this evaluation indicate that concentrations of COCs in groundwater generally remained stable in monitoring wells MW-3, MW-4, MW-8A, and MW-E. Concentrations of COCs in groundwater at MW-5 increased for vinyl

chloride, decreased for trichloroethene, cis-1,2-dichloroethene, trans-1,2-dichloroethene, and ethene, and remained stable for tetrachloroethene and 1,1-dicholorethene over the monitoring period. Increases in vinyl chloride in samples collected from MW-5 along with the production of ethene are indicative of active reductive dechlorinization. Furthermore, the general absence of tetrachloroethene with decreases on trichloroethene and cis-1,2-dichloroethene is indicative of source depletion.

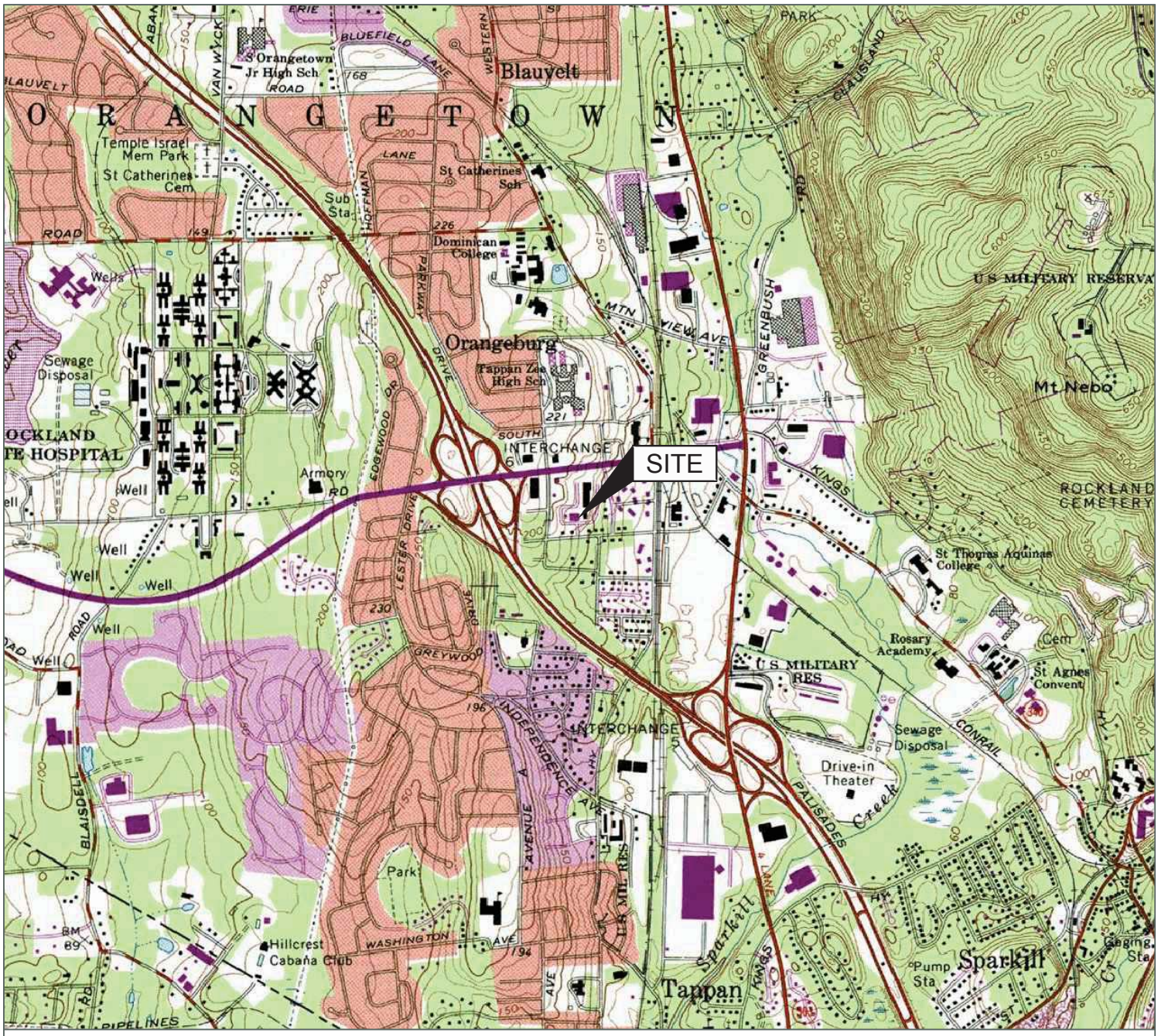
7.3 Recommendations

Based on the results of the 2018/2019 heating season soil vapor intrusion study and the approval to discontinue SVI sampling at the former Deli Spot and New China House, GES requests approval to decommission the SSDS at the New China House. An additional SVI Study will be conducted at the former Sparkle Cleaner tenant space during the 2019/2020 heating season.

Monitoring wells MW-3, MW-4, MW-8A, and MW-E are stable and monitoring well MW-5 VOC concentrations have decreased over time. Additionally, the last four quarters of groundwater samples from monitoring well MW-5 indicate favorable reducing conditions and source zone depletion in the BAS target area, when the last injection event was completed in September 2016.

Therefore, based on the current groundwater monitoring data, GES requests that groundwater monitoring for monitoring wells MW-3, MW-4, MW-5, MW-8A, and MW-E be conducted on an annual basis over the upcoming reporting period (July 2019 to July 2020) to evaluate the effectiveness of the bio-augmentation remedy. Similarly, monitoring and OM&M of the BAS will be reduced to annually during the next period. The groundwater quality parameters (TOC, pH, dissolved oxygen [DO], ORP, temperature, pH, and conductivity) will be collected during the annual sampling event. Based on the results of the 2020 annual sampling event (to be conducted in during the second quarter of 2020), GES will reevaluate the need for continued monitoring and bio-augmentation if data indicates maximum effectiveness has been obtained or if continued groundwater sampling events and/or bio-augmentation are warranted for long-term monitoring.

Figures



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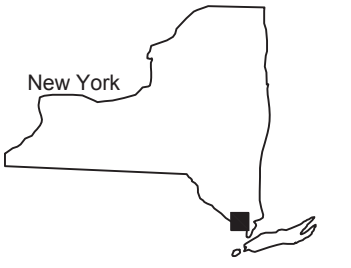

Quadrangle Location

Site Location Map

UB Orangeburg, LLC
1-45 Orangetown Shopping Center
Orangeburg, New York

Drawn: W.G.S.
Designed:
Approved:
Date: 1-23-18
Figure: 1

Scale In Feet
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GES
Groundwater & Environmental Services, Inc.

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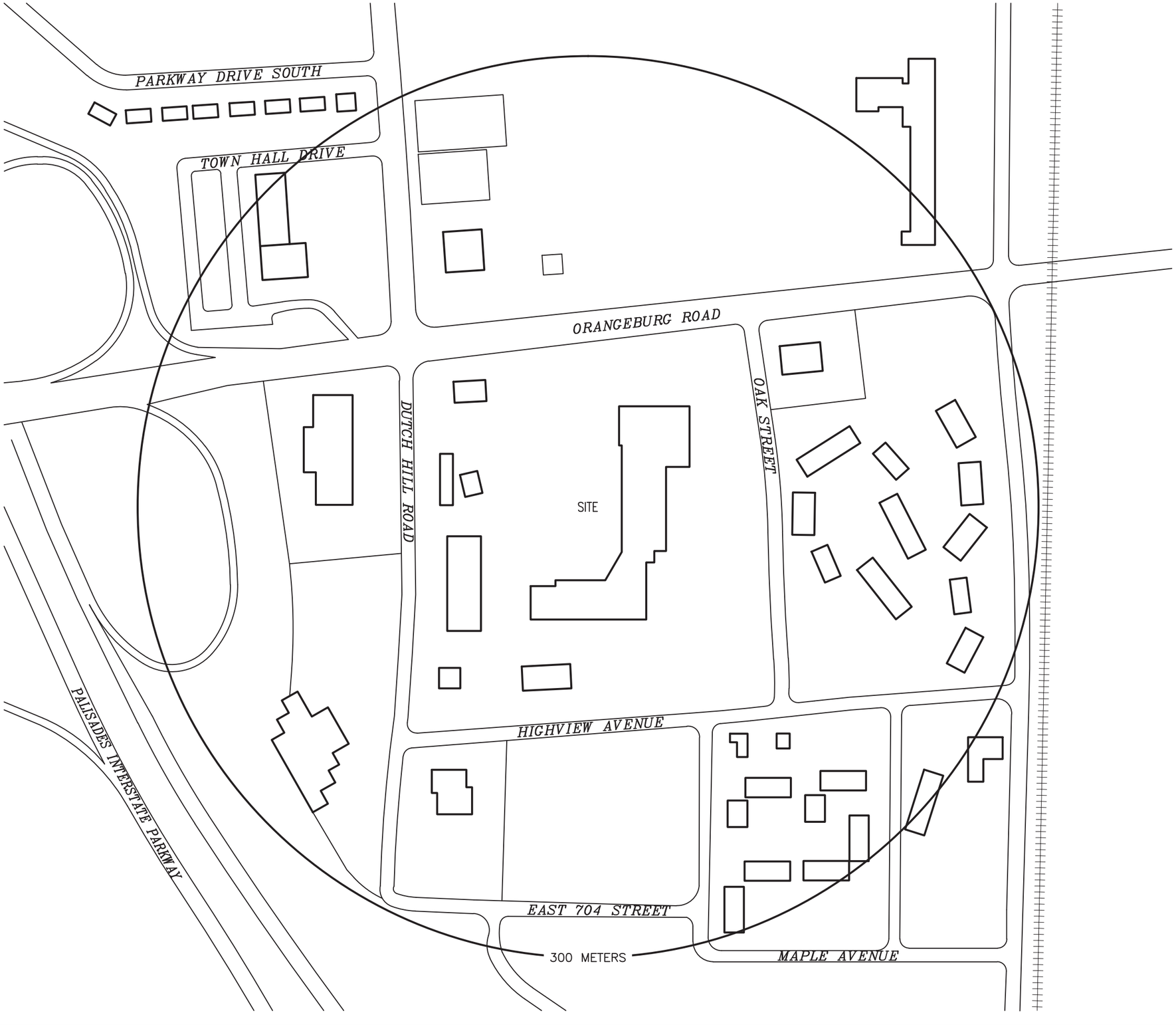

Site Map

UB Orangeburg, LLC
1-45 Orangetown Shopping Center
Orangeburg, New York

Drawn
W.G.S.
Designed

Approved

Date
1-23-18
Figure
2

Scale In Feet
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Groundwater & Environmental Services, Inc.

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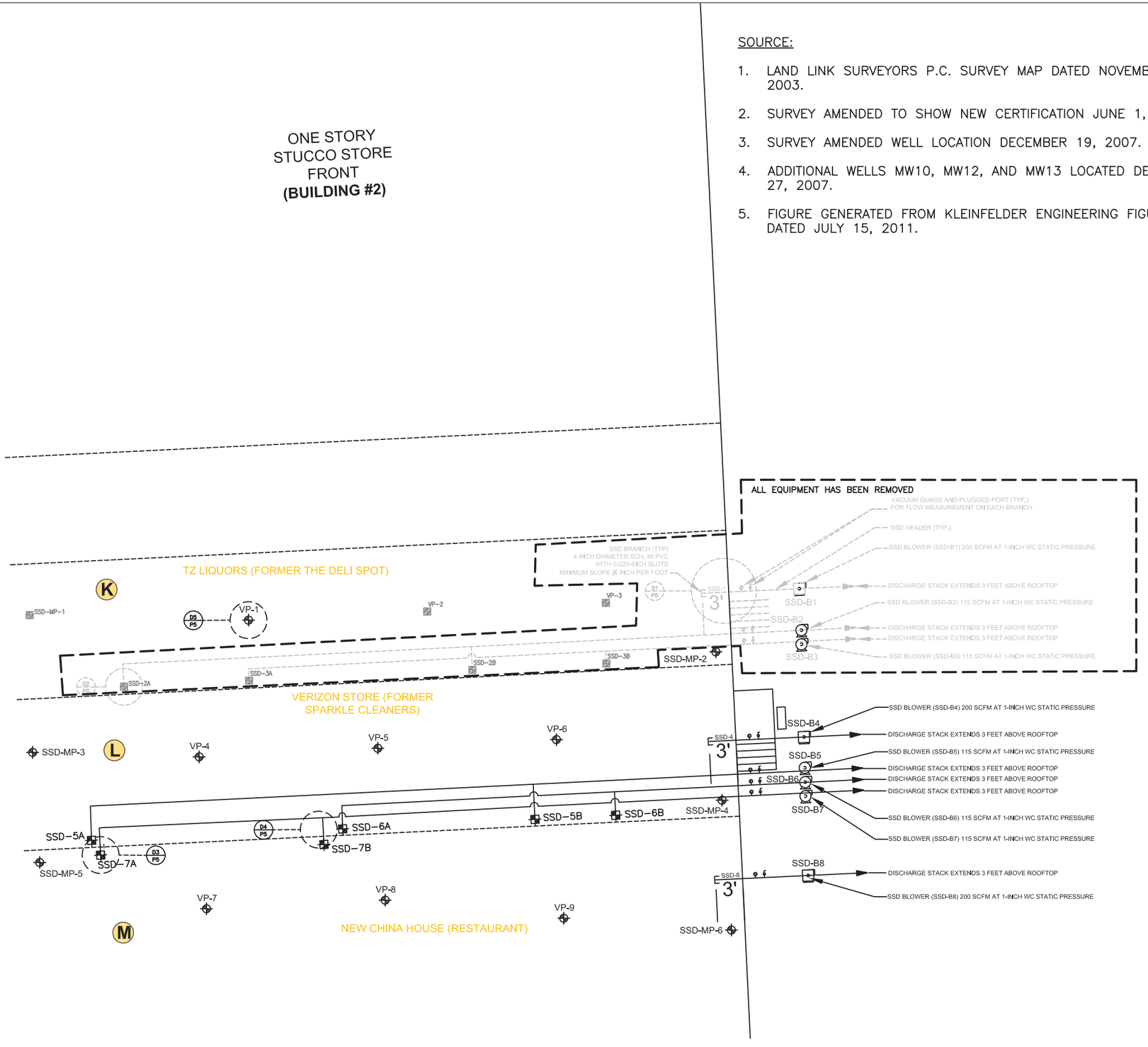


SOURCE:

1. LAND LINK SURVEYORS P.C. SURVEY MAP DATED NOVEMBER 4, 2003.
2. SURVEY AMENDED TO SHOW NEW CERTIFICATION JUNE 1, 2005.
3. SURVEY AMENDED WELL LOCATION DECEMBER 19, 2007.
4. ADDITIONAL WELLS MW10, MW12, AND MW13 LOCATED DECEMBER 27, 2007.
5. FIGURE GENERATED FROM KLEINFELDER ENGINEERING FIGURE DATED JULY 15, 2011.

LEGEND

- SSD-MP-6 — SUB-SLAB MONITORING PORT
- SUB-SLAB VAPOR EXTRACTION WELL
- D1 / P5 — DETAIL NUMBER / PLATE NUMBER
- SSD BLOWER (115 SCFM)
- SSD BLOWER (200 SCFM)
- VACUUM GAUGE
- PLUGGED PORT
- ABANDONED/DESTROYED WELL

COMMERCIAL STORE ID TABLE (BUILDING #2)

- (K) TZ LIQUORS (FORMER THE DELI SPOT)
- (L) VERIZON STORE (FORMER SPARKLE CLEANERS)
- (M) NEW CHINA HOUSE

NOTES:

1. THE EXTRACTION PIPING INSIDE THE BUILDING IS ROUTED ABOVE THE SUB-CEILING OR ALONG THE EXTERIOR WALL.
2. DISCHARGE STACKS EXTEND 3 FEET ABOVE THE ROOFTOP (TYP.).

Sub-Slab Depressurization Configuration

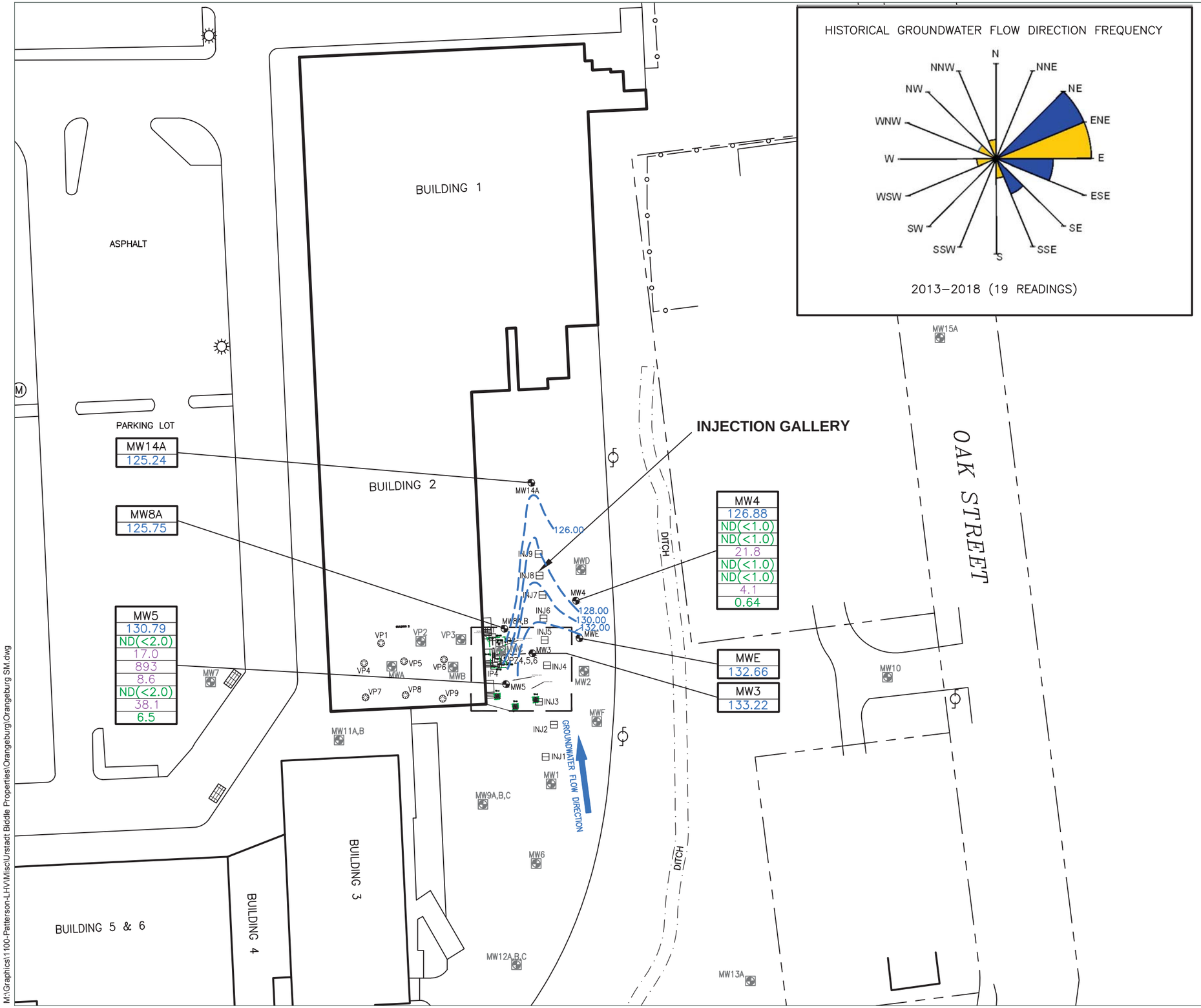
UB Orangeburg, LLC
1-45 Orangetown Shopping Center
Orangeburg, New York

Drawn: W.G.S.
Designed:
Approved:
Date: 7/2/19
Figure: 4

Not to Scale

Groundwater & Environmental Services, Inc.

M:\Graphics\1100-Patterson-LHV\Misc\Urstadt Biddle Properties\Orangeburg\Engineering\Orangeburg (KLF-details).dwg, Template B, WSHEA



LEGEND

- PROPERTY BOUNDARY
- CHAIN LINK FENCE
- CATCH BASIN
- UTILITY MANHOLE
- UTILITY POLE
- LIGHT POLE
- FIRE HYDRANT
- MONITORING WELL
- INJECTION WELL
- DESTROYED MONITORING WELL
- PIEZOMETER
- SOIL VAPOR EXTRACTION WELL

MW5	WELL IDENTIFICATION
129.44	GROUNDWATER ELEVATION (feet)
ND(<5.0)	TETRACHLOROETHENE CONCENTRATION (ug/L)
9.8	TRICHLOROETHENE CONCENTRATION (ug/L)
758	CIS–1,2–DICHLOROETHENE CONCENTRATION (ug/L)
6	TRANS–1,2–DICHLOROETHENE CONCENTRATION (ug/L)
ND(<5.0)	1,1–DICHLOROETHENE CONCENTRATION (ug/L)
136.0	VINYL CHLORIDE CONCENTRATION (ug/L)
47.6	ETHENE CONCENTRATION (ug/L)
ug/L	MICROGRAMS PER LITER
ND	NOT DETECTED
<#	WHERE AN ANALYTE IS NOT DETECTED, A METHOD DETECTION LIMIT IS GIVEN
NS	NOT SAMPLED

NOTE:

VALUE SHADED PURPLE EXCEEDS NYSDEC TOGS 1.1.1 GWQS.

Groundwater Monitoring Map
September 19, 2018

UB Orangeburg, LLC
1-45 Orangetown Shopping Center
Orangeburg, New York

Drawn W.G.S.
Designed
Approved
Date 11/9/18
Figure 5

Scale In Feet
0 50

Groundwater & Environmental Services, Inc.

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LEGEND

- PROPERTY BOUNDARY
- CHAIN LINK FENCE
- CATCH BASIN
- UTILITY MANHOLE
- UTILITY POLE
- LIGHT POLE
- FIRE HYDRANT
- MONITORING WELL
- INJECTION WELL
- DESTROYED MONITORING WELL
- PIEZOMETER
- SOIL VAPOR EXTRACTION WELL

MW5	WELL IDENTIFICATION
133.00	GROUNDWATER ELEVATION (feet)
1.6	TETRACHLOROETHENE CONCENTRATION (ug/L)
23.5	TRICHLOROETHENE CONCENTRATION (ug/L)
766	CIS–1,2–DICHLOROETHENE CONCENTRATION (ug/L)
4.0	TRANS–1,2–DICHLOROETHENE CONCENTRATION (ug/L)
ND(<1.0)	1,1–DICHLOROETHENE CONCENTRATION (ug/L)
176	VINYL CHLORIDE CONCENTRATION (ug/L)
4.1	ETHENE CONCENTRATION (ug/L)
ug/L	MICROGRAMS PER LITER
ND	NOT DETECTED
<#	WHERE AN ANALYTE IS NOT DETECTED, A METHOD DETECTION LIMIT IS GIVEN
NS	NOT SAMPLED

NOTE:

VALUE SHADED PURPLE EXCEEDS NYSDEC TOGS 1.1.1 GWQS.

Groundwater Monitoring Map
December 21, 2018

UB Orangeburg, LLC
1-45 Orangetown Shopping Center
Orangeburg, New York

Drawn W.G.S.
Designed
Approved
Date 1/23/19
Figure 6

Scale In Feet
0 50

Groundwater & Environmental Services, Inc.

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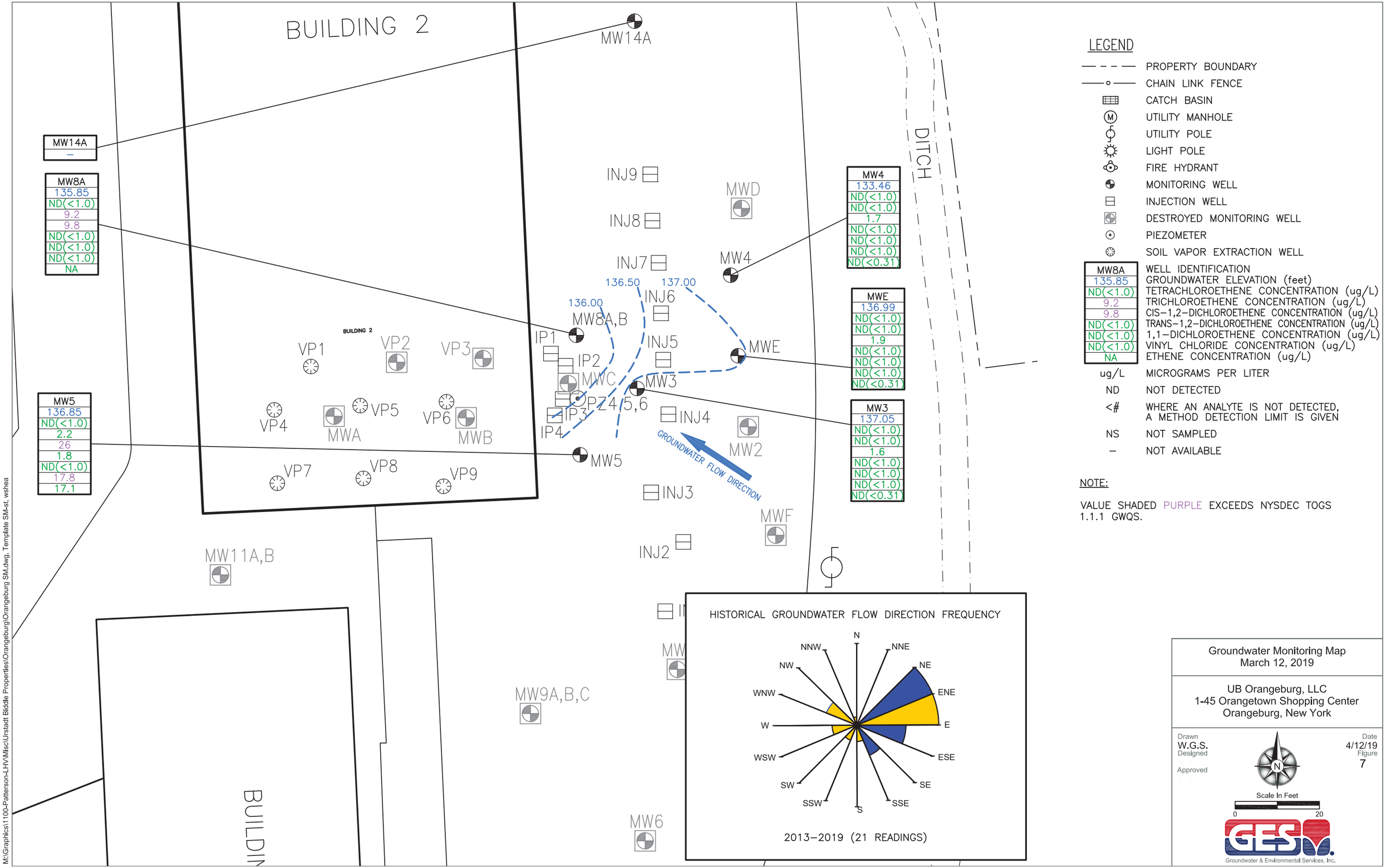
BUILDING 2
MW14A
MW14A
–
MW8A
135.85
ND(<1.0)
9.2
9.8
ND(<1.0)
ND(<1.0)
ND(<1.0)
NA
MW5
136.85
ND(<1.0)
2.2
26
1.8
ND(<1.0)
17.8
17.1
INJ9
INJ8
INJ7
136.50
137.00
136.00
INJ6
MW8A,B
INJ5
IP1
IP2
MWC
MW3
PZ4,5,6
IP3
IP4
INJ4
MW2
MW5
GROUNDWATER FLOW DIRECTION
INJ3
MWF
INJ2
MWD
MW4
MWE
VP1
VP2
VP3
VP4
VP5
VP6
MWA
MWB
VP7
VP8
VP9
MW11A,B
MW9A,B,C
MW6
DITCH
MW4
133.46
ND(<1.0)
ND(<1.0)
1.7
ND(<1.0)
ND(<1.0)
ND(<1.0)
ND(<0.31)
MWE
136.99
ND(<1.0)
ND(<1.0)
1.9
ND(<1.0)
ND(<1.0)
ND(<1.0)
ND(<0.31)
MW3
137.05
ND(<1.0)
ND(<1.0)
1.6
ND(<1.0)
ND(<1.0)
ND(<1.0)
ND(<0.31)
HISTORICAL GROUNDWATER FLOW DIRECTION FREQUENCY
N
NNW
NNE
NW
NE
WNW
ENE
W
E
WSW
ESE
SW
SE
SSW
SSE
S
2013–2019 (21 READINGS)
LEGEND
PROPERTY BOUNDARY
CHAIN LINK FENCE
CATCH BASIN
UTILITY MANHOLE
UTILITY POLE
LIGHT POLE
FIRE HYDRANT
MONITORING WELL
INJECTION WELL
DESTROYED MONITORING WELL
PIEZOMETER
SOIL VAPOR EXTRACTION WELL
MW8A
135.85
ND(<1.0)
9.2
9.8
ND(<1.0)
ND(<1.0)
ND(<1.0)
NA
WELL IDENTIFICATION
GROUNDWATER ELEVATION (feet)
TETRACHLOROETHENE CONCENTRATION (ug/L)
TRICHLOROETHENE CONCENTRATION (ug/L)
CIS–1,2–DICHLOROETHENE CONCENTRATION (ug/L)
TRANS–1,2–DICHLOROETHENE CONCENTRATION (ug/L)
1,1–DICHLOROETHENE CONCENTRATION (ug/L)
VINYL CHLORIDE CONCENTRATION (ug/L)
ETHENE CONCENTRATION (ug/L)
ug/L MICROGRAMS PER LITER
ND NOT DETECTED
<# WHERE AN ANALYTE IS NOT DETECTED, A METHOD DETECTION LIMIT IS GIVEN
NS NOT SAMPLED
– NOT AVAILABLE
NOTE:
VALUE SHADED PURPLE EXCEEDS NYSDEC TOGS 1.1.1 GWQS.
Groundwater Monitoring Map
March 12, 2019
UB Orangeburg, LLC
1-45 Orangetown Shopping Center
Orangeburg, New York
Drawn
W.G.S.
Designed
Approved
Date
4/12/19
Figure
7
Scale In Feet
0
20
Groundwater & Environmental Services, Inc.
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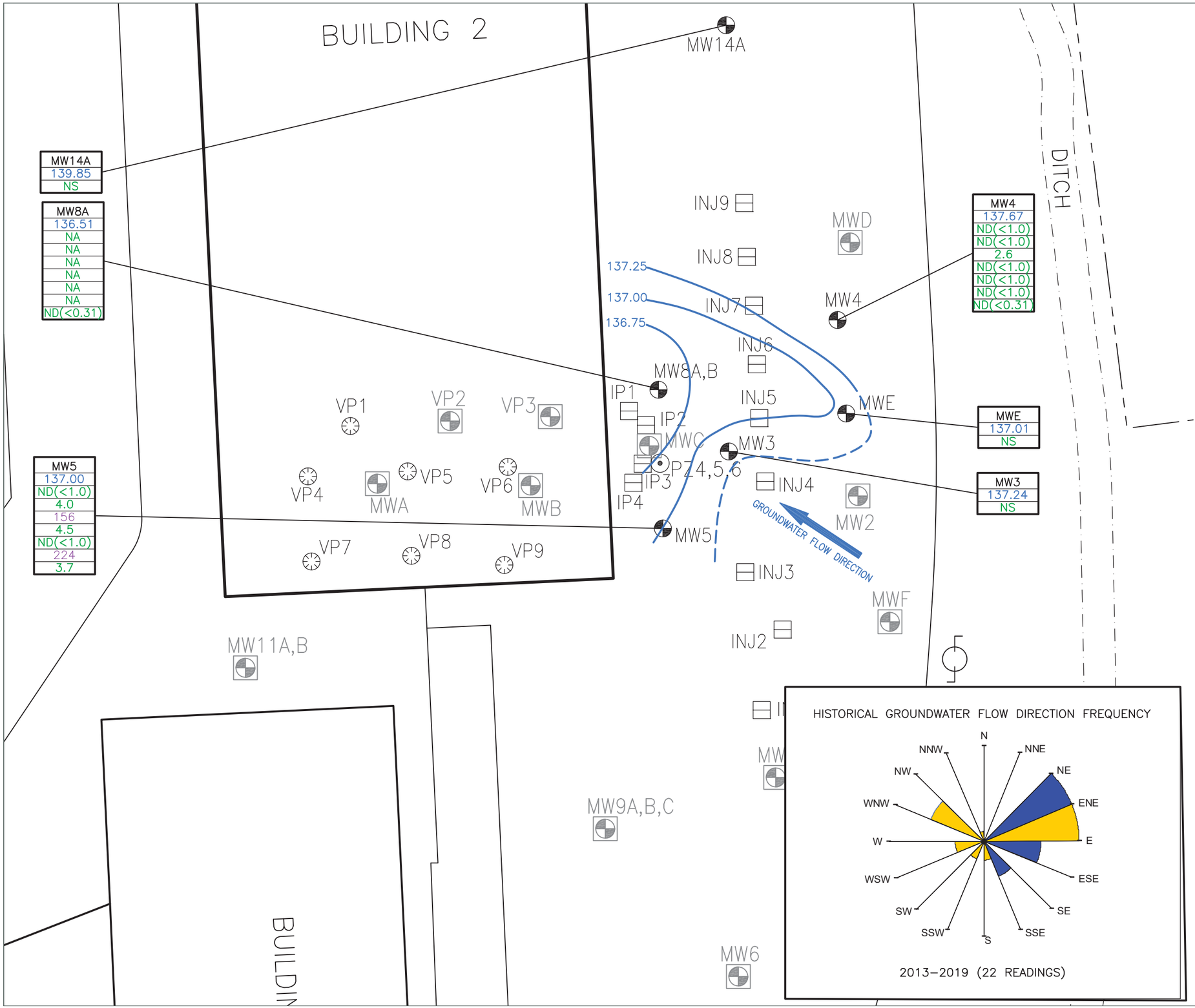

LEGEND

- PROPERTY BOUNDARY
- CHAIN LINK FENCE
- CATCH BASIN
- UTILITY MANHOLE
- UTILITY POLE
- LIGHT POLE
- FIRE HYDRANT
- MONITORING WELL
- INJECTION WELL
- DESTROYED MONITORING WELL
- PIEZOMETER
- SOIL VAPOR EXTRACTION WELL

MW8A
136.51
NA
NA
NA
NA
NA
NA
ND(<0.31)

- WELL IDENTIFICATION
- GROUNDWATER ELEVATION (feet)
- TETRACHLOROETHENE CONCENTRATION (ug/L)
- TRICHLOROETHENE CONCENTRATION (ug/L)
- CIS–1,2–DICHLOROETHENE CONCENTRATION (ug/L)
- TRANS–1,2–DICHLOROETHENE CONCENTRATION (ug/L)
- 1,1–DICHLOROETHENE CONCENTRATION (ug/L)
- VINYL CHLORIDE CONCENTRATION (ug/L)
- ETHENE CONCENTRATION (ug/L)
- ug/L — MICROGRAMS PER LITER
- ND — NOT DETECTED
- <# — WHERE AN ANALYTE IS NOT DETECTED, A METHOD DETECTION LIMIT IS GIVEN
- NS — NOT SAMPLED
- – — NOT AVAILABLE

NOTE:

VALUE SHADED PURPLE EXCEEDS NYSDEC TOGS 1.1.1 GWQS.

MW14A WAS NOT USED TO GENERATE GROUNDWATER CONTOURS.

Groundwater Monitoring Map
May 13, 2019

UB Orangeburg, LLC
1-45 Orangetown Shopping Center
Orangeburg, New York

Drawn W.G.S.
Designed
Approved

Date 6/28/19
Figure 8

Scale In Feet
0 20

Groundwater & Environmental Services, Inc.

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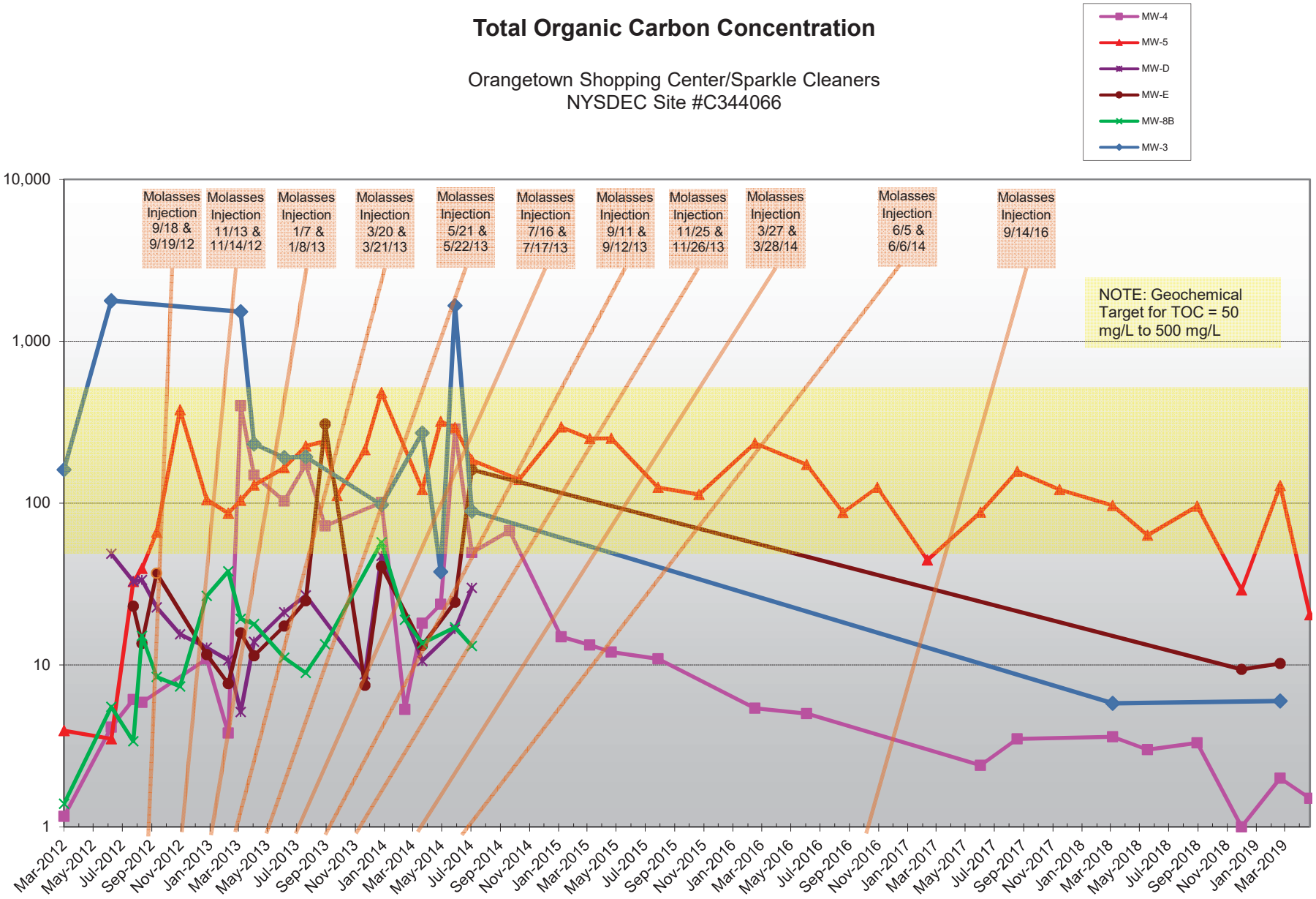
Figure 9

Total Organic Carbon Concentration

Orangetown Shopping Center/Sparkle Cleaners
NYSDEC Site #C344066

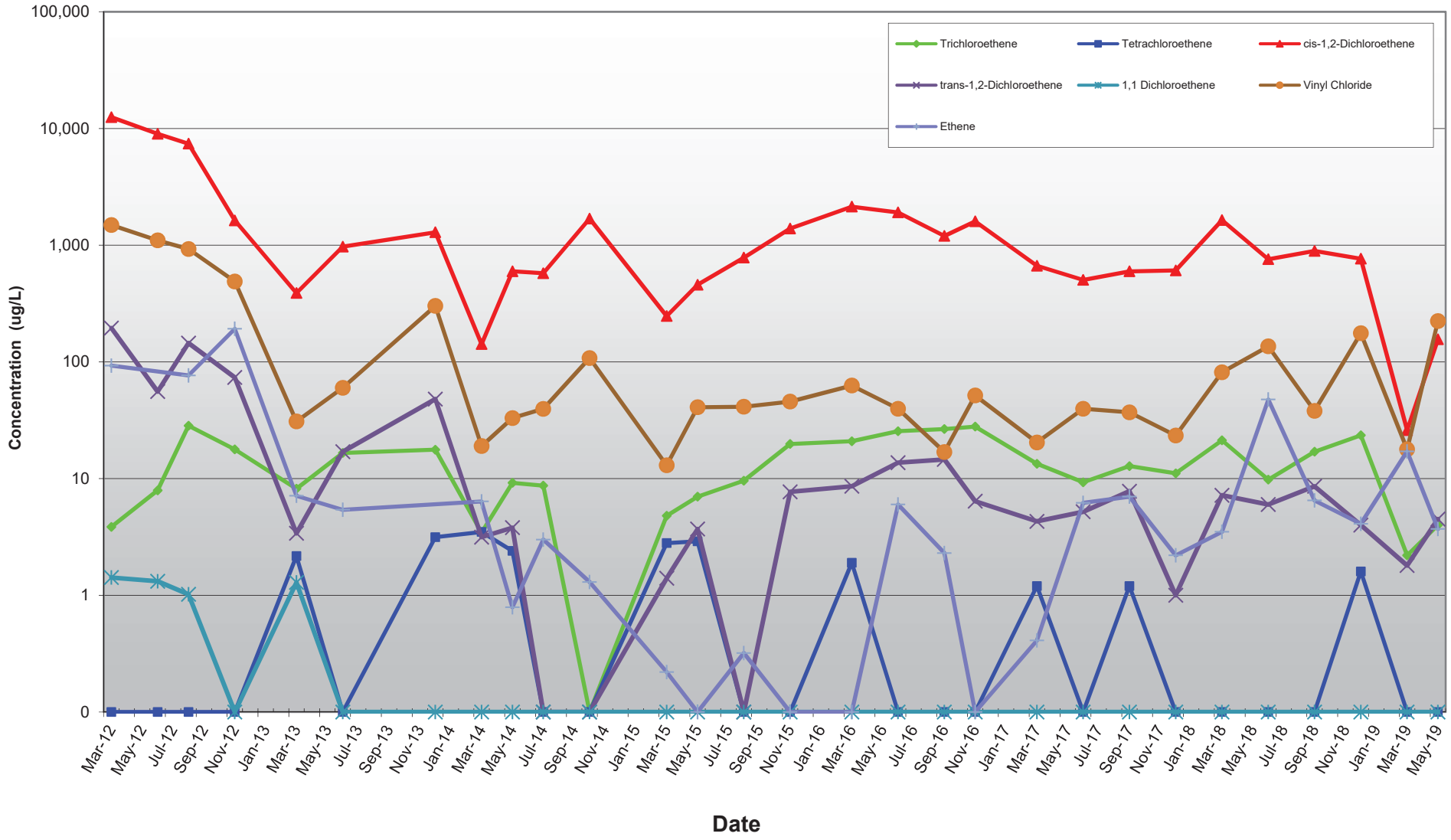


Date

Figure 10

MW-5
Chlorinated Solvent Reductive Transformation Pathway

Orangetown Shopping Center/Sparkle Cleaners
NYSDEC Site #C344066



ONE STORY
STUCCO STORE
FRONT
(BUILDING #2)

SOURCE:

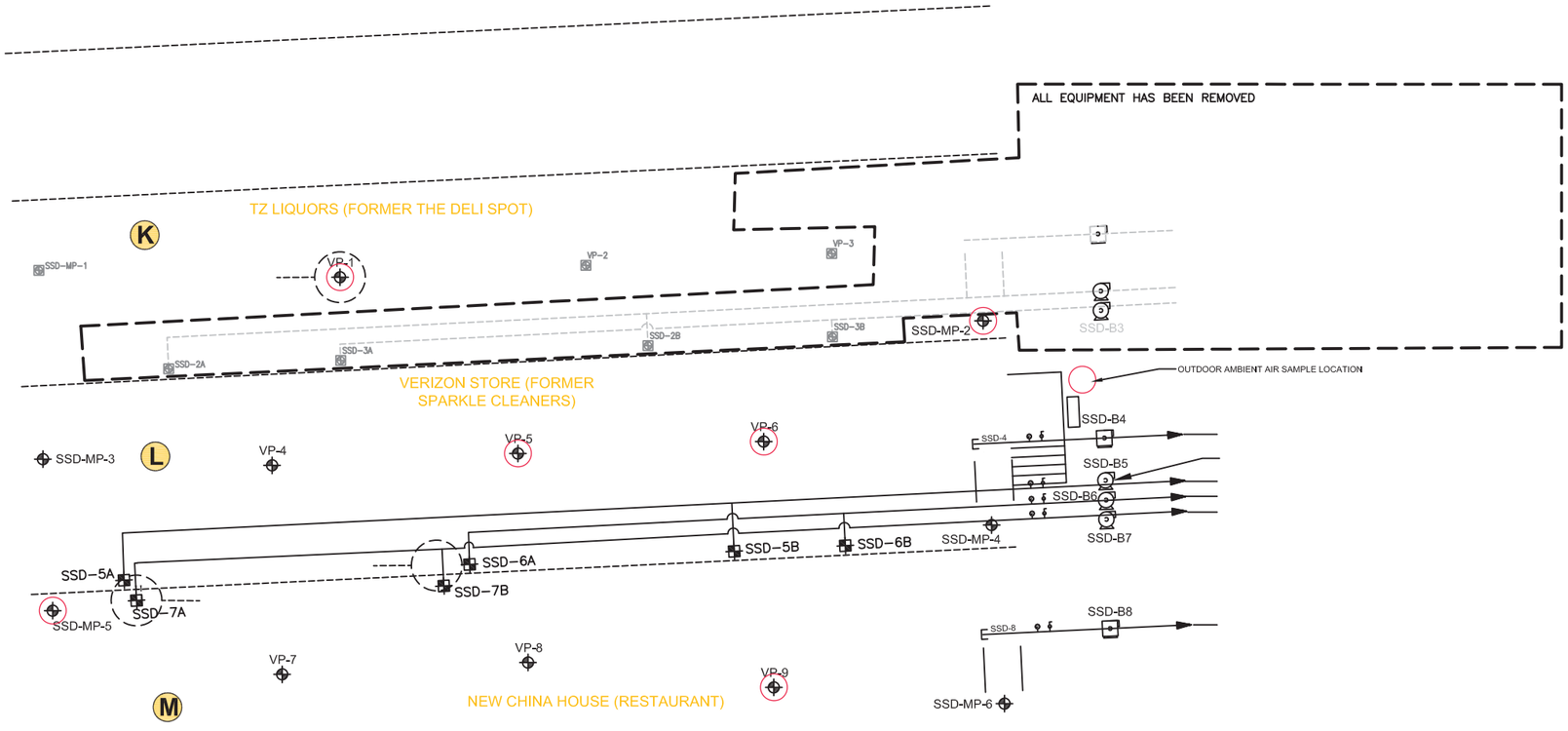
1. LAND LINK SURVEYORS P.C. SURVEY MAP DATED NOVEMBER 4, 2003.
2. SURVEY AMENDED TO SHOW NEW CERTIFICATION JUNE 1, 2005.
3. SURVEY AMENDED WELL LOCATION DECEMBER 19, 2007.
4. ADDITIONAL WELLS MW10, MW12, AND MW13 LOCATED DECEMBER 27, 2007.
5. FIGURE GENERATED FROM KLEINFELDER ENGINEERING FIGURE DATED JULY 15, 2011.

LEGEND

- SSD-MP-6 — SUB-SLAB MONITORING PORT
- SUB-SLAB VAPOR EXTRACTION WELL
- D1 / P5 — DETAIL NUMBER / PLATE NUMBER
- SSD BLOWER (115 SCFM)
- SSD BLOWER (200 SCFM)
- VACUUM GAUGE
- PLUGGED PORT
- ABANDONED/DESTROYED WELL
- Sub-slab and/or Ambient Air Sample Location

COMMERCIAL STORE ID TABLE (BUILDING #2)

- (K) TZ LIQUORS (FORMER THE DELI SPOT)
- (L) VERIZON STORE (FORMER SPARKLE CLEANERS)
- (M) NEW CHINA HOUSE



Sub-Slab and Ambient Air Sampling Map

UB Orangeburg, LLC
1-45 Orangetown Shopping Center
Orangeburg, New York

Drawn: W.G.S.
Designed:
Approved:
Date: 7/2/19
Figure: 11

Not to Scale

GES
Groundwater & Environmental Services, Inc.

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