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**Department of
Environmental
Conservation**

**New York State Department of
Environmental Conservation
Division of Environmental Remediation**

**315 North Meadow Street Site
Monitoring Program
Site No. 755014**

**Periodic Review Report
(July 2018 through November 2019)**



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Note:

Several “clickable” links, which direct the reader to supporting information, such as tables, figures, etc., are present within this report, and are denoted by blue text.

EXECUTIVE SUMMARY	
Category	Summary/Results
Site Classification	The site is currently classified Class 2.
Site Management Plan	The Site Management Plan is dated November 2017 (certified 2018).
Site History	• Preliminary Site Assessment 2006. • Off-site soil vapor intrusion investigation 2006. • Remedial Investigation/Feasibility Study 2010. • Record of Decision 2010. • Remedial Activities - 2011-2015.
Engineering Controls	• Cover System • Sub-slab Depressurization Systems
Institutional Controls	Environmental Easement which includes: • Groundwater Use Restriction; • Soil Management Plan; • Land-use Restriction; • Building Use Restriction; • Monitoring Plan; • Site Management Plan; • O&M Plan; and • IC/EC Plan.
Certification/Reporting Period	The Certification Period is annual. This Periodic Review Report (PRR) covers the time frame from July 18, 2018 to November 18, 2019. The next Periodic Review Report will cover the period November 2019 through November 2020.
Prior PRR/SMR Recommendations	This is the first PRR for this Site.
Routine Site Management Activities	Two rounds of groundwater level measurements were collected during this reporting period. Site inspections were conducted on June 25, 2018 and September 18, 2019. Groundwater monitoring was conducted In June 2018 and September 2019 with samples collected from 15 well locations in June 2018 and 16 well locations in September 2019. Samples were analyzed for volatile organic compounds (VOCs) using USEPA Method 8260C.
Non-Routine Site Management Activities	Two monitoring wells were sampled for emerging contaminants in June 2018.
Trend Analysis	Concentrations of PCE and TCE have decreased and concentrations of cis-1,2-DCE and vinyl chloride have increased in select on-site monitoring wells since remediation was completed in 2015. Refer to Appendix D . A summary of the sampling results relative to the Standards, Criteria and Guidance (SCGs) are presented in Table 1 .

Significant Findings or Concerns	The results of the June 2018 and September 2019 groundwater sampling event indicated that constituents of concern (cis-1,2-DCE, trans-1,2-DCE, TCE, PCE, and vinyl chloride) were detected at concentrations exceeding the NYSDEC Class GA Groundwater Standards in several monitoring wells.
Cost Evaluation	The total cost of the site management activities during this reporting period was \$15,009.13. This cost includes engineering and subcontractor costs (e.g., laboratory, equipment, rentals, etc.) expended by D&B. It should be noted that this total does not include any costs incurred by the NYSDEC or prior consultant in support of the project.
Recommendations	Conduct annual sampling in the third quarter of 2020, prior to making any recommendations to monitoring frequency or SMP modifications. Add geochemical parameters to suite of analysis in next round. PFAS contamination be further assessed and listed as a potential contaminant of concern. Additional investigation is warranted.

1.0 INTRODUCTION

This report is the first PRR for the 315 North Meadow Street Site since the completion of the remedy in March 2015 and covers the period from July 18, 2018 through November 18, 2019. To monitor for continued performance of the Site remedy, the NYSDEC issued a work assignment to D&B Engineers and Architects, P.C. (D&B) in October 2018 under D&B's State Superfund Standby Contract. This assignment transferred responsibility of the Site management activities to D&B, beginning in the first quarter of 2019. Since approval of the SMP in September 2018, one groundwater monitoring event has been conducted, completed in September 2019. Portions of this report include the June 2018 data as well as pertinent historical background information and monitoring data from the following reports:

- ❖ Preliminary Site Assessment (February 2006)
- ❖ Field Investigation Letter Report (July 2006)
- ❖ Remedial Investigation/Feasibility Study Reports (RI/FS) (September 2009/April 2010)
- ❖ Final Engineering Report (FER) (November 2017)
- ❖ Site Management Plan (SMP) (November 2017)
- ❖ Analytical Data Packages ([Appendix A](#))

The objectives of this PRR include:

- ❖ Presenting a summary of pertinent background information;
- ❖ Identifying the cleanup goals established for the Site;
- ❖ Presenting a brief description of the remedy and remaining contamination;
- ❖ Identifying, reviewing and evaluating:
 - Site monitoring protocols, procedures and documentation;
 - Condition of the remedy;
 - Compliance with the ROD and the SMP;

- Current institutional and engineering controls;
- Site management costs;
- Remedy performance, effectiveness and protectiveness; and
Supporting decisions/providing justification to modify or end Site management activities, reclassify the Site, or delist the Site.
- ❖ Determining the frequency and type of subsequent periodic reviews;
- ❖ Providing an institutional control and engineering control (IC/EC) certification.
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1.1 Site Description and Project Background

The 315 North Meadow Street property (the Site) is located near the intersection of North Meadow Street and West Court Street in the City of Ithaca, Tompkins County (**Figure 1**). The Site is designated on the tax map of the County Clerk of Tompkins County as tax map parcel number: Section 59, Block 3, Lot 1. The Site is approximately 0.2 acres in size and is improved with a single-story commercial building. Asphalt and/or concrete paved parking surfaces surround the building to the north and west. A gravel parking area is located south of the building, and a driveway is to the east. The building is a slab-on-grade structure with approximately 2,700 square feet of the space used for dry cleaning service activities. A small single-story addition (approximately 400 square feet) on the north end of the building is currently operated as a barber shop. Surrounding land uses include residential, commercial, and parking properties. The grade at the site is generally flat with an elevation of approximately 386 feet above mean sea level (see **Figure 2** (FER, 2017)).

The Site has historically been used for dry cleaning services and continues to operate as an active dry-cleaning business. Tetrachloroethene (PCE) is a solvent that was commonly used in the dry-cleaning industry until 1999. Though PCE is currently not used at the Site, historical releases of PCE appear to have occurred at the Site in the form of leaks or spills in the building or directly to the ground surface at the southeast corner of the building.

In October 2005, the NYSDEC initially identified the Site as a Potential (P) site, and as a result of the Environmental Site Assessment conducted in connection with a potential property transaction for an adjacent property and the Preliminary Site Assessment completed for the Site in 2005, the Site was relisted as a Class 2 site in the Registry of Inactive Hazardous Waste Disposal Sites in New York in March 2006.

A Remedial Investigation/Feasibility Study (RI/FS) was conducted from March 2007 through March 2009 to evaluate the nature and extent of contamination at the Site and to identify alternatives for addressing threats to human health and the environment. Based on the findings of the RI, the disposal of hazardous waste at the Site resulted in the contamination of soil and groundwater. The primary contaminants of concern (COCs) for the Site which determined the need for remediation of soil and groundwater and were addressed by the remedy selection process are: Tetrachloroethene (PCE), Trichloroethene (TCE), cis-1,2-dichloroethene (cis-1,2-DCE), and vinyl chloride (VC).

Sampling completed through the RI/FS identified PCE levels in on-site soils ranging from 0.0012-220.0 mg/kg in the subsurface from zero to six feet below grade. Other VOCs detected (e.g., ethylbenzene and xylene) are indicative of a petroleum spill, related to the 1,000-gallon Underground Storage Tank (UST) encountered near the southeast corner of the building.

Soil containing constituents of concern at concentrations greater than NYS Part 375 Unrestricted Soil Cleanup Objectives (SCOs) was removed from the Site during a remedial excavation performed in August 2011 as part of the Site remediation in accordance with the October 2010 Record of Decision (ROD). Soil remaining on-site exceeding Unrestricted SCOs was covered with on-site buildings, pavement, concrete or a minimum of 12 inches of soil and/or gravel. Enhanced anaerobic bioremediation including injections of emulsified vegetable oil was performed at the Site to remediate groundwater. Post remediation groundwater monitoring conducted subsequent to the injection program has indicated that residual chlorinated volatile organic compound (VOC) contamination remains in the Site groundwater at concentrations greater than applicable New York State Department of Environmental Conservation (NYSDEC) Class GA Groundwater Standards. The Site remedy relies on adherence to the Site Management Plan (SMP) (2017) to ensure continued protection of public health and the environment from contamination remaining at the Site.

1.2 Summary of Remedial Activities

Remedial activities were conducted at the Site between August 2011 and March 2015 in accordance with the October 2010 ROD. The following is a summary of the Remedial Actions performed at the Site as presented in the SMP. To address contamination in the Site subsurface, the NYSDEC selected Enhanced Anaerobic Bioremediation and Limited Soil Excavation as the remedy. Prior to the completion of the October 2010 ROD, an SSDS was installed at the on-site building by the owner of the 315 North Meadow Street property. In August 2011, Aztech Technologies, Inc. performed a limited excavation of soils to the east and south of the existing building at 315 North Meadow Street (see [Figure 3](#) (FER, 2017)). Over 600 tons of materials were excavated, with approximately 387 to 437 tons disposed of as non-hazardous waste and approximately 219 tons disposed of as hazardous waste. During the remedial excavation, a 1,000-gallon UST was encountered in the eastern portion of the site which contained sand and petroleum-contaminated aqueous liquid. The tank was removed and disposed off-site. Bottom soil samples from the excavation were collected. The analytical results indicated PCE concentrations exceeding the Unrestricted Use and protection of groundwater SCOs in areas south of the 315 N. Meadow Street building. In addition, remaining contamination may be present in the soil adjacent to the building which was not excavated due to the presence of utilities. Excavated areas were then backfilled with bank run gravel and crusher run. Injection well installations occurred between December 2011 and January 2012. A series of three injection events and associated pilot studies were performed between May 2012 and August 2014. The details of this injection program are discussed in the Final Engineering Report (2017). The locations of the injection wells are illustrated in [Figure 4](#) (FER, 2017). Post-injection groundwater monitoring indicated a decreasing trend of VOC's concentration.

As indicated above, the remedial actions were performed at the Site between August 2011 and March 2015 in accordance with the October 2010 ROD. A SMP was subsequently prepared in November 2017 and approved in September 2018.

1.3 Regulatory Requirements/Cleanup Goals

As per the ROD and referenced in the SMP, the remediation goals for this Site are as follows:

Public Health Protections:

Groundwater

- ❖ Prevent people from drinking groundwater with contaminant levels exceeding drinking water standards.
- ❖ Prevent contact with contaminated groundwater.
- ❖ Prevent inhalation of contaminants from groundwater.

Soil

- ❖ Prevent ingestion/direct contact with contaminated soil.
- ❖ Prevent inhalation of contaminants volatilizing from the soil.

Soil Vapor

- ❖ Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into the indoor air of buildings at or near a site.

Environmental Protection:

Groundwater

- ❖ Restore the groundwater aquifer to meet ambient groundwater quality criteria, to the extent feasible.

Soil

- ❖ Prevent migration of contaminants that would result in groundwater or surface water contamination

1.4 Residual Contamination

Residual contamination remains in the Site soils and groundwater. NYSDEC Part 375 SCOs for Unrestricted Use were exceeded for PCE and/or methylene chloride in August 2011 soil samples DOC-Area II, DOC-Area III, DOC-Area IIIB, DOC Area V (methylene chloride only), DOC-Area VIA, and DOC-Area VIB (methylene chloride only) as shown in [Figure 3](#) (FER, 2017). SCOs for residential use are exceeded for PCE in samples collected from DOC-Area II and DOC-Area III. No SCOs were exceeded for restricted residential, commercial, or industrial use.

In groundwater, PCE exceeded groundwater criteria at two monitoring well locations: monitoring well NM-MW-06S (southwest of the building) and on-site in NM-MW-05S (south of the east side of the building).

- ❖ The PCE concentration in NM-MW-06S at 160 µg/L in March 2015 was similar to historical concentrations in this monitoring well which ranged from 120 to 310 µg/L between September 2011 and December 2014. This monitoring well location is considered upgradient of the site, and has not been impacted by site remediation.
- ❖ The PCE concentration in NM-MW-05S at 950 µg/L in March 2015 was significantly lower than the Baseline Monitoring concentration in September 2011 of 22,000 µg/L. PCE concentrations in this monitoring well steadily decreased over the injection events such that the concentration was below 1,000 µg/L as of March 2015.

Following remediation of the Site, there was a significant decrease in VOC contamination, specifically PCE in monitoring wells NM-MW-02S, NM-MW-05S, and NM-MW-06S. The breakdown products (TCE, cis-1,2-DCE, and vinyl chloride) remained elevated in select wells (NM-MW-02D, NM-MW-02S, NM-MW-04D, NM-MW-04S, NM-MW-05S, NM-MW-06S, NM-MW-09D, NM-MW-10D, NM-MW-11D, NM-MW-11S, and NM-MW-12D) which can be seen in [Table 1](#) and [Figure 5-A](#).

2.0 MONITORING PLAN COMPLIANCE

The monitoring scope for the 315 North Meadow Street Site as specified in the SMP includes annual Site inspections and annual groundwater sampling. Documents reviewed in preparation of this PRR indicate one groundwater monitoring event and Site inspection was conducted by others in 2018. In addition, D&B completed a Site inspection and groundwater sampling in 2019. No maintenance was completed for this reporting period. Presented below is a summary of the monitoring activities performed throughout this reporting period, as well as an evaluation of Site-related data relative to remedy performance, effectiveness and protectiveness, as appropriate. The observations of D&B's inspection, performed during the September 2019 Site visit and sampling, are presented below.

2.1 Site Inspection

Site inspections were conducted during the 2018 and 2019 groundwater sampling events as detailed in the SMP. During the Site inspections the cover was found to be in place and in good condition. The Site inspection forms are provided in [Appendix B](#).

Since residual chlorinated VOC contamination remains within the Site at concentrations greater than applicable NYSDEC Class GA Groundwater Standards, Site inspections should continue as specified in the SMP to ensure there are no future adverse impacts to public health and/or the environment.

2.2 Groundwater Sampling and Analysis

A single groundwater sampling event was completed by D&B at the Site in September 2019 during this reporting period. A prior sampling event was completed by URS/AECOM in June 2018. Analytical results from these sampling events, as well as the March 2015 (post remediation) event are discussed in the sections below. A summary of recent analytical data relative to SCGs is presented in [Table 1](#) and [Figure 5](#).

The June 2018 groundwater sampling event and Site inspection report is provided in [Appendix C](#) and included the collection and analysis of groundwater samples from 15 of the existing Site monitoring wells.

Groundwater samples were collected from 16 of the existing Site monitoring wells between September 19 and 20, 2019 (see [Figure 4](#) (FER, 2017) for monitoring well locations). Samples were collected using a peristaltic pump in accordance with the Work Assignment and USEPA Low Flow-Low Purge Sampling Protocol. Prior to sampling, water levels in all wells were recorded on a water level gauging form. Water level measurements for both 2018 and 2019 rounds are comparable (see [Table 2](#)). Field parameters including pH, specific conductivity, temperature, turbidity, oxidation-reduction potential (ORP), and dissolved oxygen were measured during well purging using a flow-through cell system and recorded on the individual field purge logs until the parameters had stabilized.

Per the SMP, the groundwater samples collected in June 2018 were sent to Test America, a NYSDEC-approved analytical laboratory under standard chain-of-custody protocols for analysis of: TCL VOCs using USEPA Method 8260B. In addition, select samples were also analyzed for 1,4-Dioxane using USEPA Method 8270D and Per and polyfluoroalkyl substances (PFAs) (Standard List). Additionally, the collected groundwater samples in September 2019 were sent to Eurofins Test America, a NYSDEC-approved analytical laboratory under standard chain-of-custody protocols for analysis of TCL VOCs using USEPA Method 8260B.

2.2.1 VOC Results in Groundwater

Several contaminants of concern were identified in samples collected in June 2018 and September 2019 above the NYSDEC Class GA Standard as summarized in [Table 3](#). In addition, petroleum related contaminants (benzene and ethylbenzene) were detected in NM-MW-02S, NM-MW-04D, NM-MW-04S, and NM-MW-11S (see [Table 1](#)) above the NYSDEC Class GA Standard. The presence of these contaminants is attributable to the UST discovered during the remedial investigation.

For comparison, previous sampling results for each well are shown in [Table 1](#), [Figure 5](#), and [Figure 5-A](#) (FER, 2017).

Based on the trend graphs presented in [Appendix D](#), PCE and TCE concentrations have decreased significantly, while the degradation products, cis-1,2-DCE and vinyl chloride have increased in several of the monitoring wells since completion of the remedial injection program.

2.2.2 Emerging Contaminants Results in Groundwater

In June 2018, PFAS were detected in samples NM-MW-05S and NM-MW-08S. Monitoring well NM-MW-05S exhibited Perfluorooctanesulfonic acid (PFOS) at a concentration of 84 ng/l, which was the maximum concentration detected, in exceedance of the 10 ng/l screening level.

1,4-Dioxane was not detected in any of the groundwater samples that were collected in June 2018 (see [Table 1](#)).

Based on the groundwater data collected to date, residual chlorinated VOC contamination remains within the Site at concentrations greater than applicable NYSDEC Class GA Groundwater Standards. Groundwater sampling should continue for VOCs as specified in the SMP. Based on the PFOS result further evaluation may be warranted.

3.0 **INSTITUTIONAL AND ENGINEERING CONTROL PLAN COMPLIANCE**

The SMP includes an environmental easement and institutional controls to mitigate potential exposure pathways (i.e., direct contact, ingestion, or inhalation of VOCs from subsurface groundwater) during future construction work and/or ground intrusive activities. The engineering controls and/or mechanical systems that are components of the Site remedy include a cover and a sub-slab depressurization system (SSDS); therefore, operation and maintenance plans are applicable to this Site. However, the operation and maintenance of the SSDS is under the direction of the NYSDEC and not included in the SMP. The Site management activities specified in the SMP include annual Site inspections; annual groundwater monitoring; and non-routine inspections and/or maintenance, as needed.

3.1 Institutional Controls

The 315 North Meadow Street Site is managed as part of New York State's Superfund Program. The Site's inclusion in the Registry as a Class 2 Inactive Hazardous Waste Site acts as an Institutional Control (IC).

An additional IC for the Site in the form of an Environmental Easement (EE) was granted to the NYSDEC. The EE was filed with the Tompkins County Clerk's office and places the following restrictions on the Site:

- ❖ The property may be used for commercial use;
- ❖ All ECs must be operated and maintained as specified in the SMP;
- ❖ All ECs must be inspected annually as specified in the SMP;
- ❖ The use of groundwater underlying the property is prohibited without necessary water quality treatment as determined by the New York State Department of Health (NYSDOH) or the Tompkins County Department of Health to render it safe for use as drinking water or for industrial purposes, and the user must first notify and obtain written approval to do so from the Department;
- ❖ Groundwater and other environmental or public health monitoring must be performed as defined in the SMP;
- ❖ Data and information pertinent to site management must be reported at the frequency and in a manner as defined in the SMP;
- ❖ All future activities that will disturb remaining contaminated material must be conducted in accordance with the SMP;
- ❖ Monitoring to assess the performance and effectiveness of the remedy must be performed as defined in the SMP;
- ❖ Operation, maintenance, monitoring, inspection, and reporting of any mechanical or physical component of the remedy shall be performed as defined in the SMP;
- ❖ Access to the site must be provided to agents, employees or other representatives of the State of New York with reasonable prior notice to the property owner to assure compliance with the restrictions identified by the Environmental Easement;
- ❖ The potential for vapor intrusion must be evaluated for any new buildings developed in the area within the IC boundaries noted on Figure 2 (SMP, 2017), and any potential impacts that are identified must be monitored or mitigated;

- ❖ Vegetable gardens and farming on the Site are prohibited.

3.2 Engineering Control

Engineering controls and/or mechanical systems used as components of the Site remedy include a cover and a sub-slab depressurization system. Exposure to remaining contamination at the site is prevented by the cover system placed over the site. This cover system is comprised of either the structures such as the on-site building, pavement, and concrete, or a minimum of 12 inches of soil and/or gravel which meet commercial use SCOs for cover material as set forth in 6 NYCRR Part 375-6.8(b). Sub-slab depressurization (SSD) systems were installed as an Interim Remedial Measure (IRM) by the NYSDEC at adjacent off-site buildings to address current and/or potential indoor air contamination of VOCs associated with soil vapor intrusion. Operation and maintenance of these systems is under the direction of the NYSDEC. An additional SSD system was installed by the owner of the Site. This system is not maintained by NYSDEC as it is part of the owner's facility. Neither SSDS is covered under the SMP and therefore not included in this PRR.

4.0 COST EVALUATION

The total cost of the site management activities during the 2019 reporting period was \$15,009.13. This total includes engineering and site management costs associated with the project while under management by D&B. It should be noted that this total does not include any administrative costs incurred by the NYSDEC in support of the project or management costs incurred by URS in 2018. A review of the site management costs for this reporting period is provided below.

COST SUMMARY		
Cost Item ⁽¹⁾	Expended	Percent of Total
Engineering Support	\$10,475.82	69.8%
Site Management		
IDW Disposal	\$1,112.40	7.4%
Laboratory	\$1,239.29	8.3%
Expenses	\$2,181.62	14.5%
TOTALS	\$15,009.13	

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

- ❖ The SMP was in effect for the period from September 2018 through November 2019. The IC operated as intended this reporting period.
- ❖ The ECs as components of the Site remedy operated according to the SMP.

- ❖ Site and groundwater use are consistent with the restrictions set forth in the SMP.
- ❖ Per the SMP, sampling events are conducted annually. Therefore, the next groundwater sampling and analysis event should be conducted in the third quarter of 2020.
- ❖ Remediation goals, which pertain to subsurface surface soil cleanup objectives, have not been achieved; however, the remedy continued to be protective of human health and the environment during this reporting period.
- ❖ Remediation goals, which pertain to attaining the extent practicable ambient groundwater quality standards, have not been achieved.

5.2 Recommendations

- ❖ Groundwater sampling should continue for VOCs, as specified in the SMP. Since only two rounds of samples have been collected since the remediation has been completed it is recommended that another round of samples be collected before evaluating changes to the SMP. Based upon the sample results additional investigation is required.
- ❖ It is recommended that PFAS contamination be further assessed and listed as a potential contaminant of concern in groundwater at the Site and remediation be completed.
- ❖ During the next round of groundwater sampling it is recommended that geochemical parameters be analyzed at select on-site monitoring wells to determine if biodegradation is still occurring on-site.
- ❖ It is recommended that the PRRs continue to be completed annually to certify the ICs and ECs are in-place, effective and protective of human health and the environment.

6.0 CERTIFICATION

The Standby Consultant IC/EC certification is provided as [Appendix E](#).