MAY 2021

NEW YORK STATE OF OPPORTUNITY | Department of Environmental Conservation

New York State Department of Environmental Conservation

Division of Environmental Remediation

Alsy Manufacturing, Inc.
Site Monitoring Program
Site No. 130027

Periodic Review Report
(February 2018 through February 2021)

D&B Engineers and Architects

TABLE OF CONTENTS

Section	Description	Page
EXECUTIVE SUMMARY		**1**
1.0	**INTRODUCTION**	**3**
1.1	Site Description and Project Background	4
1.2	Summary of Remedial Activities	8
1.3	Regulatory Requirements/Cleanup Goals	8
1.4	Residual Contamination	9
2.0	**MONITORING PLAN COMPLIANCE**	**9**
2.1	Site Inspection	9
2.2	Groundwater Sampling and Analysis	10
2.2.1	May 2018 Groundwater Analytical Results	11
2.2.2	May 2019 Groundwater Analytical Results	11
2.2.3	August 2020 Groundwater Analytical Results	12
2.3	Non-Routine Activities	12
2.3.1	Soil Vapor Sampling Results 2020	13
2.3.2	Soil Vapor Sampling Results 2021	13
3.0	**INSTITUTIONAL AND ENGINEERING CONTROL PLAN COMPLIANCE**	**14**
3.1	Institutional Controls	14
3.2	Engineering Control	15
4.0	**COST EVALUATION**	**15**
5.0	**CONCLUSIONS AND RECOMMENDATIONS**	**16**
5.1	Conclusions	16
5.2	Recommendations	16
6.0	**GREEN REMEDIATION METRICS**	**17**
7.0	**CERTIFICATION**	**17**

TABLE OF CONTENTS (continued)

Section Description Page

LIST OF APPENDICES

EAR Report, August 2018 ..... A
Site Management Report 2019 ..... B
Daily Field Activity Report 2020 C
Soil Vapor Scope /Daily Field Activity Report/
Analytical Results ..... D
Indoor Air Sampling February 2021 ..... E
Summary of Green Remediation Metrics Form ..... F
Standby Consultant/Contractor Certification Form ..... G

LIST OF FIGURES

1 Site Location Map
2 Existing on-Site SSDS Systems
2-1 Monitoring Well Location Map
2-2 Soil Sample Exceedances
3 On-site and off-site Groundwater Exceedances
4 On-site and Off-site Trend Analysis of Concentrations in Chromium
5 On-site and Off-site Trend Analysis of Concentrations of Nickel
6 On-site and Off-site Trend Analysis of Concentrations of Iron

LIST OF TABLES

1 VOC Groundwater Monitoring Results – August 2020
2 Metals Groundwater Monitoring Results – August 2020
3 Metals Groundwater Exceedances 2018 through 2020
4 Summary of Air Sample Analytical Results VOCs 2020
5 Summary of Air Sample Analytical Results VOCs 2021
6 Historical Groundwater Results 2013 through 2018
7 Historical Groundwater Results 2013 through 2018

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 as Class 4.
Site Management Plan	The Site Management Plan is dated October 2020
Site History	• Remedial Investigation 1997 • Feasibility Study 2003 • Record of Decision 2005 • Soil Vapor Workplan 2006 • Remediation Activities 2010 • Final Engineering Report 2010
Engineering Controls	1. Sub-Slab Depressurization Systems 2. Paving System
Institutional Controls	Environmental Notice which includes: • Land-use Restriction; • Groundwater and soil vapor monitoring Plan (Monitoring Plan); • Ground Water Use Restriction; • Vapor Intrusion Evaluation for development within IC Boundaries; • Land-use Restriction; • Monitoring Plan – Revised as part of SMP update in October 2020. • Site Management Plan – Revised October 2020. • O&M Plan; and– Revised as part of SMP update in October 2020. • IC/EC Plan. – Revised as part of SMP update in October 2020.
Certification/Reporting Period	The Certification Period is every three years. This PRR covers the time frame from 2018 to 2021.
Prior PRR/SMR Recommendations	The 2018 PRR documented that the vapor mitigation systems installed at 270 and 280 Duffy Avenue were not operating. A corrective Measures Work Plan was to be requested of the property owner. The April 2020 SMR made the recommendation that monitoring well AMS-1 be replaced and to work with the property owners and their consultant regarding the operation of the SSDS systems.

Site Management Activities	Two rounds of groundwater level measurements were collected as part of sampling during two sampling events this reporting period, in May 2019 and August 2020. Two site inspections were conducted during this reporting period. May 2019: Groundwater monitoring was conducted with samples collected from nine monitoring well locations and the samples were submitted for laboratory analysis for Target Compound List (TCL) volatile organic compounds (VOCs) via USEPA method 8260, target analyte list (TAL) metals via USEPA method 6010C and 7470A and total cyanide via USEPA method 9010B. August 2020: Groundwater monitoring was conducted with samples collected from ten monitoring well locations and the samples were submitted for laboratory analysis for TCL VOCs via USEPA method 8260, TAL metals via USEPA method 6010C and 7470A and total cyanide via USEPA method 9010B.
Non-Routine Site Management Activities	In November 2020, five indoor air, five sub-slab and one ambient air samples were analyzed for VOCs via USEPA Method TO-15 for the purpose of evaluating the potential for exposures within 270 and 280 Duffy Avenue buildings in order to evaluate whether the on-site sub-slab depressurization (SSDS) systems could be decommissioned. Analytical results associated with this event are provided in **Appendix D**. Additionally, on February 3, 2021 additional indoor air sampling was completed at 280 Duffy Avenue based on the results from the November 2020 sampling event. This was coordinated via a conference call between the NYSDEC, NYSDOH and D&B. Analytical results associated with this event are provided in **Appendix E**.
Trend Analysis	A trend analysis for select metals was conducted for the groundwater data collected during this reporting period and the data indicates iron concentrations in some wells increased while concentrations in some wells decreased in both on-site and off-site monitoring wells, a stable trend for chromium in select on-site and off-site monitoring wells and a stable and increasing trend for nickel in select on-site and off-site wells, as depicted on **Figures 4, 5 and 6**. A summary of the sampling results relative to the Standards, Criteria and Guidance (SCGs) are presented on **Table 1 and Table 2**.
Significant Findings or Concerns	1. The two SSD systems located at 270 and 280 Duffy Avenue remain inoperable and require repairs. 2. Elevated VOC concentrations in sub-slab air samples collected from 270 and 280 Duffy Avenue and elevated VOC concentrations in indoor air samples collected from 280 Duffy Ave were detected during the November 2020 sampling event.

Cost Evaluation	The total cost of the site management activities during this reporting period was $55,243.47. This cost includes engineering and subcontractor costs (e.g., laboratory, equipment, rentals, etc.). It should be noted that this total does not include any costs incurred by the NYSDEC or prior consultants in support of the project.
Recommendations	1. It is recommended to replace monitoring well AMS-1 due to its side gradient location. AMS was previously reported as paved over. 2. Based on the analytical results from this reporting period, it is recommended to continue sampling groundwater for site-specific contaminants, as specified in the SMP. 3. It is recommended that the PRR be completed every five (5) years to certify the ICs and ECs are in-place, effective and protective of human health and the environment. 4. It is recommended that the NYSDEC pursue turning on the SSDSs at 270 and 280 Duffy Avenue. 5. Following startup of the systems, it is recommended that system sampling and indoor air quality sampling be performed by the owner to document the effectiveness of the systems. The owner should submit a work plan to the NYSDEC for review and approval regarding system startup and associated testing. 6. Once started and proved to be working, it is recommended that the owner prepare and submit a Site Management Plan (SMP) for the SSDS systems to the NYSDEC for their review and approval to cover long-term operation and maintenance of the systems.

1.0 INTRODUCTION

This report represents the PRR for the Alsy Manufacturing, Inc. Site and covers the period from February 13, 2018 through February 13, 2021. It should be noted that portions of this report incorporate pertinent historical background information and monitoring data from the following reports prepared by D&B Engineers and Architects (D&B) and Environmental Assessment & Remediations (EAR) :

- EAR Report, August 2018 (**Appendix A**)
- D&B Site Management Report 2019 (**Appendix B**)
- D&B Daily Field Activity Report, August 2020 (**Appendix C**)
- D&B SVI Scope of Work November 2020/D&B Daily Field Activity Report /Analytical Data Table (**Appendix D**)
- D&B Indoor Air Sampling February 2021/D&B Daily Field Activity Report /Analytical Data Table (**Appendix E**)

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.

1.1 Site Description and Project Background

The Alsy Manufacturing, Inc. Site (the Site) is located in an urban area of Hicksville, Nassau County, New York. The Site consists of two tax parcels identified as Section 11, Block G, Lots 148 and 191 on the Nassau County Tax Map (**see Figure 1**). The Site occupies approximately four-acres and is bounded by the Long Island Railroad and a construction and demolition (CD) debris recycling facility to the north, Duffy Avenue and residential properties to the south, and active and abandoned industrial commercial properties to the east and west. There are five other inactive hazardous waste disposal sites within a one-half mile radius of the Site. The Site is also less than one mile east of the New Cassel Industrial Area, which contains numerous Inactive Hazardous Waste Disposal Sites. The Site was occupied by Metalab, a laboratory furniture manufacturer prior to 1975 and from 1975 through 1991, Alsy Manufacturing, Inc., a manufacturer of electric lamps and lamp shades operated at the facility. Since 1991, the Site has been leased to various tenants for non-manufacturing commercial-type uses.

Alsy's manufacturing processes included bronze plating, electroplating, and antiquing. Waste materials that were generated included metal plating waste, wastewater treatment sludge, paint thinner, acidic paint stripper, alkaline paint stripper and 1,1,1-trichloroethane. Alsy was issued a State Pollutant Discharge Elimination System (SPDES) permit in 1977 for two separate on-site wastewater discharge points, one of which received industrial discharges consisting of copper, nickel, zinc and cyanide. The other discharge point received sanitary wastes.

Between 1997 and 1983, Alsy repeatedly violated the discharge limitations for its 1977 SPDES permits. In addition, sampling revealed disposal of unauthorized metals and VOCs.

Between February and August 1984, joint inspection by the NYSDEC and the Nassau County Department of Health (NCDOH) found violations, including four non-permitted discharge points. Behind the building, three leaching pools, several discharge pipes, and two trenches were reported to contain metals and VOC contamination. The areas where the waste disposal occurred were contaminated primarily by heavy metals. In 1984, Alsy's consultant confirmed the existence of five additional leaching pools and three dry wells at the Site. In November 1984, Alsy's consultant sampled standing water from behind the building, water from catch basin CB-3 (formerly LP-3, now identified as DW-3) and water from septic pools 1 and 2. Analytical results revealed concentrations of nickel and copper in CB-3 and copper in the standing water above the permitted discharge limit.

In April 1985, the NYSDEC issued a Summary Abatement Order (SAO) for cessation of discharges not in compliance with permits and for cleanup of the leaching pools. In response to the SAO, several leaching pools, catch basins, and soil piles behind the building were sampled. Results showed elevated concentrations of zinc, nickel, aluminum and copper.

In May 1985, NYSDEC sampling also revealed elevated concentrations of several metals (including aluminum, arsenic, cadmium, chromium, copper, iron, lead, magnesium, nickel, and zinc) and VOCs (including toluene, xylenes, ethylbenzene, 1,1,1 -trichloroethane, and methylene chloride) in the catch basins and leaching pools at the Site.

Between May and November 1985, contaminated leaching pools were reportedly pumped out and sludge was removed from these pools and disposed of off-site.

In 1987, the NYSDEC first listed the Site as a Class 2a site in the Registry of Inactive Hazardous Waste Disposal Sites in New York (the Registry). Class 2a is a temporary classification assigned to a site that has inadequate and/or insufficient data for inclusion in any of the other classifications.

Prior to 1987, five monitoring wells were installed on-site. In January 1987, groundwater from two on-site monitoring wells located behind (north of) the building was sampled. Several VOCs, including 1,1-dichloroethane, 1,1,1-trichloroethane, trichloroethene, and tetrachloroethene were detected at concentrations exceeding groundwater standards. Metals, including arsenic, chromium, copper, and lead were also found exceeding drinking water standards.

In 1987, two additional groundwater monitoring wells were installed on-site. In June 1987, sampling activities were conducted on-site by the United States Environmental Protection Agency (USEPA). Groundwater samples collected from monitoring wells GW-1 and GW-2 (which no longer exist) showed elevated concentrations of metals (aluminum, arsenic, barium, copper, lead, magnesium, manganese, mercury, nickel, cadmium, and zinc) and VOCs (1,1-dichloroethane, tetrachloroethene, 1,1,1-

trichloroethane and trichloroethene). Soil, sediment, and liquid samples from soil and leaching pools at the northern portion of the Site showed elevated concentrations of several metals (arsenic, cadmium, chromium, copper, iron, nickel, and zinc).

In June 1987, a Phase I Investigation Report was issued by NYSDEC.

Between April 1988 and June 1989, existing groundwater monitoring wells GW-1 and GW-2 were sampled and eight additional on-site monitoring wells were installed and sampled. Sample results showed elevated concentrations of 1,1,1-trichloroethane, trichloroethene, tetrachloroethene, dichloroethene, vinyl chloride, and methylene chloride as well as arsenic, barium, cadmium, chromium, lead, and mercury in groundwater. Soil samples from the bottom of three cleaned leaching pools showed no significant contamination.

In 1990, the NYSDEC listed the Site as a Class 2 site in the Registry. A Class 2 site is a site where hazardous waste presents a significant threat to the public health or the environment and action is required.

Between 1996 and 2003, the following Remedial Investigation (RI) activities were performed at the Site in several stages:

- Completion of a ground penetrating radar survey to identify subsurface structures;
- Completion of 45 soil borings throughout the Site to collect soil, groundwater and soil gas samples;
- Collection of five soil samples from a soil berm along the northern property line;
- Groundwater sampling at two depths at each of three off-site locations to profile groundwater along an east-west transect;
- Installation of seven new on-site monitoring wells and one new off-site monitoring well;
- Collection of indoor air samples at several locations within the main site buildings;
- Collection of soil and groundwater samples from subsurface structures not previously sampled;
- Collection of groundwater samples from all new and existing monitoring wells; and
- A well search was performed to identify all public, industrial, and private supply wells.

Results of the RI identified metals as the contaminant of concern in soil at the Site. The metals which exceeded standards, criteria, and guidance (SCGs) values included arsenic, beryllium, cadmium,

chromium, copper, mercury, nickel, selenium, and zinc. VOCs and metals were identified as the contaminants of concern in groundwater at the Site. The VOCs which exceeded SCG values included 1,1,1-trichloroethane, tetrachloroethene, and 1,2-dichloroethene. The metals which exceeded SCGs values in groundwater included antimony, nickel, and zinc. Additionally, 1,1,1-trichloroethane, tetrachloroethene and methylene chloride were detected in the soil vapor samples. 1,1,1-Trichloroethane, tetrachloroethene and methylene chloride were detected in soil gas beneath the site building, and methylene chloride was detected in soil gas outside the building footprint. Indoor air was sampled for 1,1,1-trichloroethane and trichloroethene using compound specific colorimetric tubes. Neither of these two compounds was detected in indoor air above the detection limits of the colorimetric tubes.

In December 2003, ERM prepared a Feasibility Study Report for the Site. The report evaluated the following alternatives:

- Alternative I: No action.
- Alternative II: Continued Commercial Use with Source Removal/Stormwater Control and Groundwater Monitoring.
- Alternative III: Excavation and off-site disposal of soil exceeding the NYSDEC RSCO guidelines to a depth of 15 ft, Source Removal/Stormwater Control and Active Groundwater Remediation.

Based on the evaluation, Alternative II was recommended as the preferred remedial action for the Site as it is a permanent remedy as defined by 6NYCRR Part 375 and by the NYSDEC FS TAGM, there are no significant short-term effects or implement ability concerns associated with the construction and operation and it was also the most cost effective.

On behalf of NYSDEC, MACTEC performed a pre-design investigation at the Site in October 2006. The following investigation activities were performed:

- Direct push soil borings in the source area to design a soil removal action;
- Groundwater profiling south of the Site to determine proper locations for off-site groundwater monitoring wells; and
- Soil vapor investigation to verify on-site shallow soil vapor concentrations.

The results of the soil investigation were used to refine the limit of soil excavation in the remedial design. Results of the groundwater investigation were used to determine the depth of off-site groundwater monitoring wells. The soil vapor investigation concluded that off-site soil vapor remedial action was not warranted.

Figure 1 presents the limits of the Site, tax parcel boundaries, Site features and Figure 2 depicts locations of the ECs.

1.2 Summary of Remedial Activities

The majority of remedial activities were conducted at the Site starting in January 2010 and completed in July 2010, in accordance with the NYSDEC-approved remedial design dated July 2009. The following is a summary of the Remedial Actions performed at the Site:

- Excavation and off-site disposal of subsurface soil exhibiting VOCs and metals concentrations greater than the commercial SCOs listed in NYSDEC 6 NYCRR Part 375 Table 375-6.8(b) to a depth of approximately 25 feet bgs;
- Installation of two separate subsurface stormwater management systems and related piping to control roof drainage and parking lot runoff on-site and to reduce infiltration of precipitation near the former contaminated areas;
- Backfilling of excavated areas with clean fill material; and,
- Paving of excavated areas with asphalt to prevent exposure to remaining contamination.

To address on-site exposures related to soil vapor, two sub-slab depressurization system (SSDSs) were installed at the Site in 2009. Off-site contaminated soil was successfully removed to meet the 6 NYCRR Part 375 Unrestricted Use SCOs for arsenic (13 ppm), trivalent chromium (30 ppm) and hexavalent chromium (1 ppm).

1.3 Regulatory Requirements/Cleanup Goals

As specified in the ROD, the remediation goals for this Site are to eliminate or reduce to the extent practicable:

- Exposures of persons at or around the site to inorganics (metals) in contaminated soil and groundwater.
- The release of contaminates from soil into groundwater that may create exceedances of groundwater quality standards; and
- The release of VOC contaminants from subsurface soil under buildings into indoor air through soil vapor.

Further, the cleanup goals for this Site include attaining to the extent practicable the following Standards, Criteria and Guidelines:

- Ambient groundwater quality standards;
- Soil TAGM values.

1.4 Residual Contamination

The potential exists for residual contamination within the subsurface at the Site. Post-excavation confirmatory samples were collected following soil removal activities to document the effectiveness of the remedial action and the remaining contamination concentrations. **Figure 2-2** depicts soil sample exceedances from 1996 and 2010. No VOCs (except acetone, a common laboratory contaminant) or SVOCs were detected in any of the post-excavation soil samples. Several metals including chromium, copper, lead, manganese, nickel and zinc were detected in the soil samples. Groundwater analytical results generated from the most recent groundwater sampling event completed at the Site (August 2020) as shown on **Table 1 and Table 2** and historical sampling results on **Table 6 and 7** indicate that site-specific contaminants have generally decreased in the majority of wells since completion of the RI between 1996 and 2003.

Figure 3 depicts on-site and off-site groundwater exceedances for groundwater results collected during this reporting period as well as previous event from 2018.

2.0 MONITORING PLAN COMPLIANCE

The monitoring scope for the Site as presented in the SMP dated October 2020 for this reporting period included annual Site inspections, inspection of the pavement system and annual groundwater sampling. Three rounds of groundwater monitoring were performed during this reporting period in May 2018, May 2019 and August 2020. Presented below is a summary of the monitoring and maintenance activities performed throughout this reporting period, as well as an evaluation of Site-related data relative to remedy performance, effectiveness and protectiveness, as appropriate.

2.1 Site Inspection

As presented above, site inspections were completed once per year and included the inspection of the site to confirm compliance with all ICs including site usage and condition of on-site and off-site groundwater monitoring wells, an evaluation of the condition and continued effectiveness of ECs (paving system) and general site conditions.

A site inspection was performed on May 15, 2019 and August 11, 2020 by D&B. There was no evidence of on-site soil disturbance noted in either inspection report and site usage was documented to be consistent with use reported in the SMP. Inspection and maintenance of the SSDS systems located at 270 and 280 Duffy Ave are under the control of the Site owner for the properties.

D&B inspections forms from May 2019 are provided in **Appendix B** and the inspections forms from August 2020 are provided in **Appendix C**.

2.2 Groundwater Sampling and Analysis

Three groundwater sampling events were completed at the Site during this reporting period, in May 2018, May 2019 and August 2020. Analytical results from May 2018, May 2019 and August 2020 sampling events are discussed in the sections below. A summary of recent analytical data relative to SCGs is presented on **Table 1 and Table 2**. Historical analytical data relative to SCGs is presented on **Table 6 and Table 7**. It should be noted that the May 2018 sampling was conducted by the previous consultant Environmental Assessment & Remediation (EAR). The analytical data package associated with this event is provided in **Appendix A**.

May 2018 Groundwater Sampling Event

During the May 2018 sampling event, groundwater samples were collected by EAR from 8 scheduled on-site and off-site monitoring wells on May 31, 2018. On-site and off-site monitoring well locations are depicted on **Figure 2-1**. Each well was purged utilizing a low-flow submersible pump. Prior to sampling, water levels in all wells were recorded on a water level gauging form. Field parameters including pH, specific conductivity, temperature, turbidity, oxidation-reduction potential (ORP), and dissolved oxygen were measured during well purging and recorded on the individual field purge logs.

Groundwater samples were sent to a NYSDEC ELAP-approved analytical laboratory under chain-of-custody procedures for analysis of VOCs via USEPA Method 8260C, TAL metals via USEPA Method 6010C and 7470A and total cyanide via USEPA Method 9010B and 1,4-dioxane via USEPA Method 8670 SIM. Additionally, groundwater samples collected from EMR-3, LMS-3, LMS-4 and MW-1 were submitted for analysis of polyfluoroalkyl substances (PFAS) via USEPA Method 537.

All field sampling forms and analytical data tables associated with this sampling event were submitted within the August 2018 dated PRR. A portion of this report including tables and analytical data is provided as **Appendix A**.

May 2019 Groundwater Sampling Event

During the May 2019 sampling event, groundwater samples were collected by D&B from 9 scheduled on-site and off-site monitoring wells on May 15 and 16, 2019. On-site and off-site monitoring well locations are depicted on **Figure 2-1**. All wells were purged utilizing a decontaminated QED Sample PRO bladder pump in accordance with the Low Flow-Low Purge Sampling Protocol outlined in the Sampling Procedures Work Plan included in SMP dated October 2020. Prior to sampling, water levels in all wells were recorded on a water level gauging form. Field parameters including pH, specific conductivity, temperature, turbidity, oxidation-reduction potential (ORP), and dissolved oxygen were measured during well purging and recorded on the individual field purge logs.

Groundwater samples were sent to a NYSDEC ELAP-approved analytical laboratory under chain-of-custody procedures for analysis of VOCs via USEPA Method 8260C, TAL metals via USEPA Method 6010C and 7470A and total cyanide via USEPA Method 9010B.

Appendix B presents all field sampling forms and analytical data tables associated with this sampling event.

It should be noted that D&B located monitoring well AMS-1 that was previously reported as paved over and LMS-1 that was also previously reported as paved over.

August 2020 Groundwater Sampling Event

During the August 2020 sampling event, groundwater samples were collected by D&B from ten on-site and off-site monitoring wells on August 11 and 12, 2020, including LMS-2 which was inadvertently sampled. Ten samples were collected using a bladder pump in accordance with the Sampling Protocol outlined in the SMP dated October 2020. Prior to sampling, water levels in all wells were recorded on a water level gauging form. Field parameters including pH, specific conductivity, temperature, turbidity, oxidation-reduction potential (ORP), and dissolved oxygen were measured during well purging and recorded on the individual field purge logs.

Groundwater samples were sent to a NYSDEC ELAP-approved analytical laboratory under chain-of-custody procedures for analysis of VOCs via USEPA Method 8260C, TAL metals via USEPA Method 6010C and 7470A and total cyanide via USEPA Method 9010B.

Table 1 and Table 2 present the analytical data tables associated with this sampling event.

Figure 3 depicts on-site and off-site groundwater exceedances for this reporting period.

2.2.1 May 2018 Groundwater Analytical Results

During the May 2018 sampling event, all VOCs were non-detect with the exception of tetrachloroethylene which was detected in one monitoring well LMS-1 at a concentration of 1 ug/l, well below its Class GA Standard of 5 ug/l. PCE was also detected in four other monitions wells (AMS-2, ERM-3, LMS-5 and MW-1), but at estimated concentrations well below the reporting limit. Several metals, including cadmium, chromium, iron, lead, manganese, nickel, selenium and sodium were detected at concentration above their respective Class GA Standards/Guidance Values. A summary of the May 2018 sampling results are provided in **Appendix A**.

2.2.2 May 2019 Groundwater Analytical Results

During the May 2019 sampling event, all VOCs analyzed for were non-detect with the exception of tetrachloroethylene which was detected in three monitoring wells LMS-1, LMS-3 and MW-2 at concentrations of 2.7, 0.62 and 0.29 ug/l, respectively, well below its Class GA Standard of 5 ug/l. Several metals, including iron, manganese, nickel, selenium, sodium and mercury were detected at concentration above their respective Class GA Standards/Guidance Values. A summary of the May 2019 sampling results, compared to 2018 exceedances are presented in the tables provided in **Appendix B**.

2.2.3 August 2020 Groundwater Analytical Results

During the August 2020 sampling event, all VOCs analyzed for were non-detect with the exception of bromodichloromethane, bromoform, chloroform, dibromochloromethane which was detected in monitoring well MW-1 at concentrations of 1.4, 1.2, 1.2 and 2 ug/l, respectively, well below their respective Class GA Standards/Guidance Values and tetrachloroethylene which was detected in monitoring wells LMS-1 and LMS-3 at concentrations of 1.1 and 0.96 ug/l, respectively, well below its Class GA Standard of 5 ug/l. Several metals, including beryllium, iron, lead, manganese, nickel, selenium, sodium and mercury were detected at concentration above their respective Class GA Standards/Guidance Values.

For comparison, previous sampling results for all metal exceedances for the previous three sampling events (2018 – 2020) are shown on **Table 3**.

Groundwater exceedances from the 2020 sampling event are shown on **Figure 3**.

In addition, trend analysis graphs have been prepared for the Site monitoring wells as shown on **Figure 4 through Figure 6** for chromium, nickel, and iron. As depicted, concentrations of chromium have exhibited a stable trend in both on-site and off-site monitoring wells as well as a decreasing trend in on-site monitoring well LMS-5. Nickel concentrations were generally stable except for on-site wells AMS-2 and LMS-4 and off-site well ERM-3 which have exhibited an increasing trend. Iron concentrations were generally stable with the exception of on-site well LMS-4 and LMS-5 and off-site wells MW-1 and MW-2.

2.3 Non-Routine Activities

At the request of the NYSDEC and the New York State Department of Health (DOH), D&B prepared a scope of work to perform indoor air sampling in accordance with DER-10 and NYSDOH's guidance document titled "Guidance for Evaluation Soil Vapor Intrusion in the State of New York", dated October 2006. The potential for soil vapor intrusion was evaluated at the Site through the collection of indoor, ambient air, sub-slab soil vapor samples at 270 and 280 Duffy Avenue. The NYSDEC and DOH approved scope of work is provided in **Appendix D.**

Additional indoor air sampling was completed at the site in February 2021 at 280 Duffy Avenue at the request of the DOH. A formal scope of work was not prepared for this sampling event, but the details of the sampling was discussed during a conference call between the NYSDEC, DOH and D&B. The indoor and ambient air samples were collected following the same procedures listed in the NYSDEC and DOH approved scope or work provided in **Appendix D**.

2.3.1 Soil Vapor Sampling Results 2020

In November 2020, a total of eleven air samples were collected for volatile organic compound (VOC) analysis at 270 and 280 Duffy Avenue. Five sub-slab soil vapor samples, five indoor air samples and one outdoor ambient air samples were collected. Sub-slab soil vapor, indoor air and outdoor ambient air samples were analyzed for VOCs via USEPA Method TO-15. A summary of detected VOC concentrations in sub-slab soil vapor, indoor air and outdoor ambient air samples is provided in **Table 4.**

Several VOCs were detected in both indoor air and sub-slab air samples. Specifically, the VOCs 1,1,1-trichloroethane (1,1,1-TCA), methylene chloride, tetrachloroethylene (PCE) and trichloroethylene (TCE) were detected within sub-slab samples at concentrations significantly higher than other VOC detections. The highest concentration of 1,1,1-TCA was 1,500 ug/m3 detected in sub-slab soil vapor collected from sample location 270SS-02. Methylene chloride was detected within sub-slab soil vapor samples and the indoor air sample at elevated level at 280 Duffy Avenue. The highest concentration of methylene chloride was 1,200 ug/m3 detected in indoor air sample completed from sample location 280IA-01. The highest concentration of TCE was 960 ug/m3 detected in sub-slab soil vapor sample collected from sample location 280SS-02. Indoor air and sub-slab soil vapor samples were directly compared to the decision matrices provided by the NYSDOH. 1,1,1-TCA, methylene chloride and TCE were detected at concentrations within the sub-slab soil vapor samples for which the NYSDOH would recommend mitigation. Additionally, methylene chloride was detected at a concentration within the indoor air sample for which the NYSDOH would recommend mitigation. PCE was also detected but detected at levels that when compared to NYSDOH would recommend no further action. No other VOC compounds from the NYSDOH Soil Vapor/Indoor Air Matrices A through C were detected at concentrations that would require monitoring or mitigation.

2.3.2 Soil Vapor Sampling Results 2021

In February 2021, a total of two air samples were collected for volatile organic compound (VOC) analysis at 280 Duffy Avenue. One indoor air sample and one outdoor ambient air samples was collected. The indoor air and outdoor ambient air samples were analyzed for VOCs via USEPA Method TO-15. A summary of detected VOC concentrations in indoor air and outdoor ambient air samples is provided in **Table 5.**

3.0 INSTITUTIONAL AND ENGINEERING CONTROL PLAN COMPLIANCE

3.1 Institutional Controls

The intent of this section is to provide a description of the institutional controls for the Site as well as the mechanisms to monitor and enforce these controls. Institutional controls were identified in the SMP. These Institutional Controls are:

- Compliance with the Environmental Notice by the property owner with all elements as defined in the SMP dated October 2020;
- All ECs must be operated and maintained as specified in the SMP;
- All ECs on the controlled property must be inspected and certified at a frequency and in a manner as defined in the SMP;
- Groundwater and soil vapor monitoring must be performed as defined in the SMP;
- Data and information pertinent to site management of the controlled property must be reported at a frequency and in a matter as defined in the SMP; and,
- On-site and off-site environmental monitoring devices including groundwater monitoring wells must be protected and replaced as necessary to ensure the devices function in the manner specified in the SMP.

The Site has a series of ICs in the form of site restrictions. Adherences to these ICs is required by the Environmental Notice. Site restrictions that apply to the controlled property are:

- The property may only be used for commercial and industrial use provided that the long-term ECs/ICs included in this SMP are employed;
- The property may not be used for a higher level of use, such as unrestricted, residential or restricted-residential use without additional remediation and amendment of the Environmental Notice, as approved by the NYSDEC;
- All future activities on the property that will disturb remaining contaminated material must be conducted in accordance with this SMP;
- The use of the groundwater underlying the property is prohibited without treatment rendering it safe for its intended use;
- The potential for vapor intrusion must be evaluated for any buildings developed in the area within the IC boundaries noted on the legal description in the Environmental Notice and any potential impacts that are identified must be monitored or mitigated;

- Vegetable gardens and farming, including livestock and dairy farming, on the property are prohibited; and

- Site owner or remedial party will submit to NYSDEC a written statement that certifies, under penalty of perjury, that controls employed at the controlled property are unchanged from the previous certification or that any changes to the controls were approved by the NYSDEC and nothing has occurred that impairs the ability of the controls to protect public health and the environment or that constitute a violation or failure to comply with the SMP. NYSDEC retains the right to access such controlled property at any time in order to evaluate the continued maintenance of any and all controls. This certification shall be submitted every five years, or any alternate period of time that NYSDEC may allow and will be made by an expert that NYSDEC finds acceptable.

3.2 Engineering Control

Engineering controls have been established at the Site and are designed to limit contaminant migration by reducing the amount of water entering the residual contaminated soil. Additionally, ECs have been established to address the on-site exposure to soil vapor, these controls are assessed as a whole during annual Site inspections, which are as follows:

- Paving System, and

- Sub-Slab Depressurization Systems.

4.0 COST EVALUATION

The total cost of the site management activities for this reporting period was $55,243.47. This total includes engineering and site management costs associated with the project. It should be noted that this total does not include any administrative costs incurred by the NYSDEC or the prior consultant in support of the project. 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	$43,475.87	78.7%
Site Management		
Laboratory	$6,411.43	11.6%
Expenses	$5,356.17	9.7%
TOTALS	**$55,243.47**	100%

(1) Site management costs are based on D&B's effort since taking Site Management responsibilities in October 2018. Site management costs do not include maintenance activities completed directly by the NYSDEC.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusions

Monitoring Plan

- Monitoring Well Contaminant Concentrations: Based on the results from the groundwater sampling conducted during this reporting period, select metals remain above Class GA Standards, however, an overall decreasing trend has been observed since the remediation at the Site was completed.

- Ambient Air, Indoor Air and Sub-Slab Air Contaminant Concentrations: As noted in Section 2.3.1, several VOCs exceeded the NYSDOH Matrices requiring mitigation. Specifically, 1,1,1-TCA, TCE and methylene chloride exceeded NYSDOH matrices during the November 2020 sampling event.

Institutional and Engineering Controls

- IC/EC Compliance Status: No changes have been made to the property during this reporting period. However, as documented in the previous Certification, the SSDS systems have not been in operation, specifically the system located at 270 Duffy Avenue as the 280 Duffy Avenue System was never reportedly turned on.

- Site and groundwater use are consistent with the restrictions set forth in the SMP.

- The SMP was in effect for the period of February 13, 2018 through February 13, 2021.

- Per the SMP, groundwater sampling events are conducted annually.

- Remediation goals, which pertain to attaining to the extent practicable ambient groundwater quality standards, have not been achieved.

5.2 Recommendations

- It is recommended to replace monitoring well AMS-1 due to its side gradient location. AMS-1 was previously reported as paved over.

- Based on the analytical results from this reporting period, it is recommended to continue sampling groundwater for site-specific contaminants, as specified in the SMP.

- It is recommended that the PRR be completed every five (5) years to certify the ICs and ECs are in-place, effective and protective of human health and the environment.

- It is recommended that the NYSDEC pursue turning on the SSDSs at 270 and 280 Duffy Avenue.
- Following startup of the systems, it is recommended that system sampling and indoor air quality sampling be performed by the owner to document the effectiveness of the systems. The owner should submit a work plan to the NYSDEC for review and approval regarding system startup and associated testing.
- Once started and proved to be working, it is recommended that the owner prepare and submit a site management plan (SMP) for the SSDS systems to the NYSDEC for their review and approval to cover long term operation and maintenance of the systems.

6.0 GREEN REMEDIATION METRICS

A summary of Green Remediation Metrics Form for the Site is presented in **Appendix F**.

7.0 CERTIFICATION

IC/EC Certification for the reporting period February 13, 2018 through February 13, 2021 is presented in **Appendix G**.