Interim Remedial Measure Work Plan A

Former Liberty Brass Off-Site
NYSDEC Site No. 241178A

43-25 38th Street
Long Island City, Queens, New York
Werwaiss Warehouse

Non-FOILable / Confidential

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Chazen Project No. 42005.00

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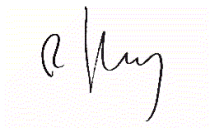
I certify that this Work Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER10).



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1.0 INTRODUCTION

The Chazen Companies (Chazen) has prepared this Interim Remedial Measure Work Plan (IRMWP) on behalf of Liberty Brass / Ideal Trading Co to mitigate the potential for soil vapor intrusion at 43-25 38th Street (Site), hereinafter referred to as the Werwaiss Warehouse, or Warehouse. This Off-Site property (hereinafter "Site") is being investigated and mitigated for soil vapor intrusion as part of the Former Liberty Brass Off-Site #C241178A Consent Order Index #R2-20170515-184 obligations. Additional properties may be investigated and / or remediated as part of this project. The work presented herein represents Interim Remedial Measure A (IRM A.) The objective of this IRMWP is to confirm, control, and mitigate the potential intrusion of vapors remaining under the Werwaiss site that could be entering indoor air.

The results of a previous investigation indicates the presence of trichloroethylene (TCE) in sub-slab soil vapor and indoor air at concentrations that require additional action. This Work Plan presents a phased strategy to mitigate the potential for soil vapor intrusion at the Werwaiss Warehouse. The objectives of this work plan are to (1) eliminate the pathway for vapor migration from the sub-surface to indoor air, (2) install suction pits / venting wells and perform communications testing to support the design of a sub-slab depressurization system, if required, (3) perform confirmation sub-slab and soil vapor sampling to confirm whether a soil vapor condition continues to exist, (3) evaluate the potential contribution from ambient outdoor and / or other potential sources in the immediate vicinity of the Site, and (5) protect human health and the environment at the Site in connection with potential for soil vapor intrusion from the Former Liberty Brass Site by mitigating the exposure pathway.

The conceptual site model for the Site indicates that vapors containing TCE levels, are present in sub-slab soil vapor at concentrations that may present a risk for vapor intrusion according to a comparison of the matrices in the October 2006 (Updated May 2017) New York State Department of Health (NYSDOH) Guidance for Evaluating Soil Vapor Intrusion in the State of New York ("NYSDOH Guidance.") Even though New York State does not have soil vapor cleanup standards, when the levels of both indoor air and sub-slab samples for one of the eight substances contained in the Guidance matrices exceed the recommended levels for mitigation, then mitigation is recommended by NYSDOH. With respect to this Site in relation to the remediated Former Liberty Brass Brownfield Cleanup Program (BCP) Site next door, these

vapors appear to have accumulated and become trapped beneath the slab despite ongoing soil vapor extraction. The exact source of the vapors is not known with certainty, since there are also volatile organic sources (VOC) sources migrating onto the Liberty Brass site from upgradient sources. However, he conditional Track 1 remediation performed at the Former Liberty Brass Site has treated, contained, and / or removed the TCE-contaminated soil on that BCP site. The remedial action for the Former Liberty Brass Site also included the installation of a soil vapor extraction (SVE) system to remove residual volatile organic compounds (VOCs) from the vadose zone in the onsite remaining contamination area and mitigate the potential for vapor intrusion throughout the site. This SVE system is removing residual vapors from the sub-surface thereby preventing the off-site migration of vapors and mitigating the potential for soil vapor intrusion at the Werwaiss Warehouse.

Field observations indicate that damaged concrete and linear cracks in the southern portion of the Werwaiss Warehouse may represent a potential pathway for the migration of sub-slab soil vapor to migrate into the Werwaiss Warehouse. The phased remedial approach presented herein will mitigate the potential for sub-surface vapors to enter the building through:

(1) Removal and replacement of the damaged concrete slab near the loading area in the southwest portion of the warehouse,

(2) Sealing cracks in the slab in the southeast portion of the warehouse to the degree practicable using a non-Volatile Organic Compound (VOC) caulk and/or foam in slab cracks followed by the application of an epoxy layer or equivalent, and

(3) Installation of suction pits and / vent wells to confirm the design of a sub-slab depressurization system (SSDS), if necessary, and performing communications testing which will have the added benefit of removing vapors that have accumulated beneath the slab.

Since only one sampling event has been performed in January 2019 as described below, vapors that formerly accumulated beneath the slab may be substantially reduced by both the removal through the Liberty Brass Site SVE system and removal and replacement of portions of the slab, which work will allow trapped vapors to freely escape, as well as the communications testing process which will actively remove trapped vapors from the sub-surface. Following these activities, sub-slab and indoor air will be re-sampled to confirm whether concentrations of sub-

slab and indoor air vapors require additional action pursuant to the NYSDOH soil vapor intrusion decision making guidance. After this re-sampling, it may be determined that an SSDS is not required and that the remedial actions in this IRMWP were sufficient to mitigate previously trapped TCE soil vapors.

Upon completion of the IRM, Chazen will prepare and an IRM Construction Completion Report (CCR.) Should sampling results indicate that additional action may be necessary, Chazen will work with NYSDEC to determine appropriate next steps.

2.0 SITE BACKGROUND

The Werwaiss Warehouse is an approximately 6,000 square foot (sf) warehouse located to the north of, and adjacent to, the Former Liberty Brass Site, located at 38-01 Queens Blvd. The Former Liberty Brass Site has been remediated by a third party under the New York State Brownfield Cleanup Program (BCP) to Conditional Track 1 levels. An April 2019 Off-Site Soil Vapor Investigation Report prepared by P.W. Grosser Consulting presents the results of the January 2019 soil vapor sampling work performed consistent with a New York State Department of Environmental Conservation (NYSDEC)-approved Work Plan dated January 2018. The results of the January 2019 Off-Site Soil Vapor Investigation indicated that the concentration of TCE in sub-slab soil vapor was 97 $\mu g/m^3$ and the indoor air concentration was 6 $\mu g/m^3$. According to the (NYSDOH) Guidance, these results indicated that mitigation was recommended for the Werwaiss Warehouse at that time.

On May 13, 2019, PWGC transmitted the sampling results along with recommendations for next steps to the owner of the Werwaiss Warehouse, W B Werwaiss Realty LLC c/o Werwaiss & Co., Inc., (Werwaiss), as required by NYSDEC.

As part of the Conditional Track 1 remediation performed at the Former Liberty Brass Site, all TCE-contaminated soil on that site has been treated, contained, and / or removed. A soil vapor extraction (SVE) system installed at the Former Liberty Brass Site is removing residual vapors from the sub-surface thereby preventing the off-site migration of vapors and mitigating the potential for soil vapor intrusion at the Werwaiss Warehouse. Therefore, conditions may have changed in the last year and several months since the time the first and only samples were taken at the Site.

2.1 Site Location, Current Usage, and Description of Surrounding Properties

The Site is located at 43-25 38th Street immediately north-adjacent to the Former Liberty Brass BCP Site, which soil has been remediated by a third party under the New York State Brownfield Cleanup Program (BCP) to Track 1 levels, but which groundwater and soil vapor is continuing to be remediated pursuant to an SVE system.

The on-Site tenant operations at the Werwaiss Warehouse include storing and building crates, packing artworks, furniture, and other specialty items, receiving and releasing crates. The Warehouse is almost entirely filled with packed crate storage with many permanent storage racks along the walls throughout the Warehouse. There are three offices located in the northwest portion of the building, the northernmost of which overlies a small utility cellar. The tenant has five employees each of which spend approximately 3 out of 5 days each week in the building, either in the Warehouse or the offices. The warehouse loading gate is typically kept open except in the winter months when it is open intermittently. This practice frequently introduces outdoor air into the warehouse, which mitigates the potential for exposure.

In addition, it is important to note that the NYSDOH Guidance matrices have been primarily developed for residential exposure scenarios which assume exposure for 24 hours per day, seven days per week. In contrast, the Site is a commercial warehouse with large loading dock doors that open and close frequently and / or are often kept open for extended periods with limited on-Site personnel.

Based upon the long history of industrial usage in the surrounding area, other regional upgradient sources of dissolved-phase chlorinated aliphatic hydrocarbons (CAHs) in groundwater have potentially migrated beneath the Former Liberty Brass Site as well as the adjacent properties. In addition, there are numerous commercial and industrial properties in the immediate vicinity of the Site, with the potential to have used and / or released chlorinated solvents to the sub-surface and which may represent an additional potential source of TCE in the subsurface at the Site. The source(s) of the vapors detected in samples collected at the Adjacent Properties has not been conclusively identified.

The Site location is presented in **Figure 1**.

There are presently no plans to redevelop the property to a different use and the tenants have just renewed their lease.

2.2 Site Geology/Hydrogeology

The Site is located over the Long Island aquifer system, which underlies all of Nassau, Suffolk, Kings (Brooklyn,) and Queens Counties. The unconsolidated aquifer formations form a southward-dipping wedge that attains a maximum thickness in Kings County about eight-hundred (800) feet in southeast area of Brooklyn. Overlying bedrock in the area is the Lloyd, Magothy, Jameco, and Upper Glacial aquifer systems. The Upper Glacial aquifer overlies all underlying units and is found at the surface in nearly all of Kings and Queens Counties.

The Site overlies an interconnected aquifer system consisting of the upper glacial deposits and the underlying Magothy Formation. Depth to groundwater in the underlying glacial aquifer is approximately 46 feet bgs. The lithologic description of the sediments from soil borings installed during previous investigations at the Former Liberty Brass Site identifies the contaminated fill material from zero to approximately twelve feet bgs underlain by layers of fine to medium silty sands and silt.

Regional groundwater flow direction is southeast to northwest. Municipal water supply is provided by the New York City Department of Environmental Protection (NYCDEP.)

3.0 SITE HISTORY

3.1 Historical Uses and Surrounding Properties

A review of historical documentation indicates that the property at 43-25 38th Street was developed sometime prior to 1936 and has been utilized as a manufacturing facility in 1936 and as a garage from approximately 1947 to 1950 prior to being utilized as a warehouse. The property is owned by WB Werwaiss Realty LLC. The property contains two separate warehouse units, with the southern unit being investigated having been occupied by CFL Art Services, which stores, transports, and installs art, since at least 2005.

A number of additional properties with the potential to have utilized and / or released TCE to the sub-surface exist within the immediate vicinity of the Site including but not limited to, a former electro-plating facility, multiple former manufacturing facilities, multiple former auto

repair facilities, the former manufacturing and garage use at this Site, and the Former Liberty Brass Site. Surrounding land uses are presented in **Figure 2**.

3.2 Environmental Setting

This section provides information on the Site geology, soils, hydrogeology, surface water resources, and land uses in the site vicinity.

3.2.1 Geology

The geologic setting of Long Island is well documented and consists of crystalline bedrock composed of schist and gneiss overlain by layers of unconsolidated deposits. Immediately overlying the bedrock is the Raritan Formation, consisting of the Lloyd sand confined by the Raritan Clay Member. The Lloyd sand is an aquifer and consists of discontinuous layers of gravel, sand, sandy and silty clay, and solid clay. The Raritan Clay is a solid and silty clay with few lenses of sand and gravel; abundant lignite and pyrite; and gray, red or white in color.

Above the Raritan Clay lies the Magothy Formation. The Magothy Aquifer consists of layers of fine to coarse sand of moderate to high permeability, with inter-bedded lenses of silt and clay of low permeability resulting in areas of preferential horizontal flow. Therefore, this aquifer generally becomes more confined with depth. The Magothy Aquifer is overlain by the Jameco and Upper Glacial Aquifer systems. The Upper Glacial Aquifer is the water table aquifer at this location and is comprised of medium to coarse sand and gravel with occasional thin lenses of fine sand and brown clay. This aquifer extends from the land surface to the top of the Magothy and, therefore, is hydraulically connected to the Magothy Aquifer.

3.2.2 Hydrogeology

The Former Liberty Brass Site is located over the Long Island aquifer system, which underlies all of Nassau, Suffolk, Kings (Brooklyn), and Queens Counties. The unconsolidated aquifer formations form a southward-dipping wedge that attains a maximum thickness in Kings County about eight-hundred (800) feet in southeast area of Brooklyn. Overlying bedrock in the area is the Lloyd, Magothy, Jameco, and Upper Glacial aquifer systems. The Upper Glacial aquifer overlies all underlying units and is found at the surface in nearly all of Kings and Queens Counties.

The Former Liberty Brass Site overlies an interconnected aquifer system consisting of the upper glacial deposits and the underlying Magothy Formation. Depth to groundwater in the underlying glacial aquifer is approximately 46 ft bgs. The lithologic description of the sediments from soil borings installed during previous investigations at the Former Liberty Brass Site identifies the contaminated fill material from zero to approximately 12 ft bgs underlain by layers of fine to medium silty sands and silt.

Regional groundwater flow direction is southeast to northwest. Municipal water supply is provided by the New York City Department of Environmental Protection (NYCDEP). The Site elevation is approximately 65 feet above mean sea level and is generally level.

3.3 Summary of Previous Investigations

An Off-Site Soil Vapor Investigation was performed in January 2019 by former consulting firm P.W. Grosser Consulting (PWGC) consistent with a New York State Department of Environmental Conservation (NYSDEC)-approved Work Plan. The scope of work consisted of a geophysical survey, site inspection, and collection of co-located sub-slab and indoor air samples. The purpose was to determine if an off-site vapor intrusion condition existed at 4the Site as the result of migration of soil vapor from the Former Liberty Brass Site located at 38-01 Queens Boulevard in Long Island City, Queens, New York. Data gaps remain regarding the potential contribution from ambient outdoor sources and / or other potential sources in the immediate vicinity of the Site.

On January 17, 2019, PWGC collected one sub-slab vapor sample under the concrete slab and one indoor air sample above the floor from a central location within the Warehouse. The samples were analyzed for VOCs according to EPA method TO-15. The work was performed consistent with the approved Off-Site Soil Vapor Investigation Work Plan. The results of the Off-Site Soil Vapor Investigation at the Warehouse indicated that the concentration of TCE in sub-slab soil vapor was 97 µg/$m^3$and the indoor air concentration was 6 µg/m^3. The concentration of tetrachloroethylene (PCE) in sub-slab soil vapor was 19 µg/m^3 and the indoor air concentration was 5 µg/m^3. According to the New York State Department of Health (NYSDOH) Guidance for Evaluating Soil Vapor Intrusion in the State of New York, the TCE results indicate that mitigation is recommended for the Warehouse. According to NYSDOH guidance these results do not require immediate action.

On May 13, 2019, following the review and approval of the NYSDEC and NYSDOH, PWGC submitted a transmittal package containing a summary of work performed as well as sampling results and related, to the Warehouse pursuant to NYSDOH guidance. As part of this transmittal, Ideal Trading / Liberty Brass requested that available architectural plans and / or building as-built drawings be provided, and that the owner provide access to perform a walk-through of the entire building, including basement structures, to further evaluate building conditions including basement configuration and characteristics and to identify appropriate potential sampling locations.

The building is comprised primarily of a warehouse built on a concrete slab. The tenant operations include storing and building crates, packing artworks, furniture, and other specialty items, receiving and releasing crates. The Warehouse is almost entirely filled with packed crate storage with many permanent storage racks along the walls throughout the Warehouse. There are three offices located in the northwest portion of the building farthest away from the part of the building adjacent to the Liberty Brass BCP site, the northernmost of which overlies a small utility cellar. The tenant has five employees each of which spend approximately 3 out of 5 days each week in the building, either in the warehouse or the office. The Warehouse loading gate is typically kept open from April through October and is open intermittently between October and April.

Throughout the majority of the Warehouse the concrete slab appears to be intact with the exception of the southernmost 20 feet where the concrete is damaged and / or cracked and which is adjacent to the Liberty Brass BCP Site. The damaged concrete in the loading area is limited to the southernmost 15 to 20 ft of the building and extends from the entrance of the loading gate on the western side of the building to approximately 45 ft to the east. There are also several linear cracks in the southernmost 15-20 ft of the building that extend further east for another approximately 40 ft.

Figure 3 presents the layout of the Werwaiss Warehouse.

4.0 CONCEPTUAL SITE MODEL

Pursuant to DER-10 Section 3.2.2, a CSM has been prepared to develop a general understanding of the potential for a soil vapor intrusion condition to exist at the Site and assist in the evaluation of contaminant fate and transport and, ultimately, the potential for a completed

human exposure pathway to be present. This CSM considers the building history and context, including the factors that influence distribution, and fate and transport of remedy-relevant constituents, as well as potential receptors and pathways for exposure. These factors include potential sources and release mechanisms, the physical-chemical mechanisms that control constituent fate and transport, and the likely exposure pathways that govern the potential for adverse effects to human and ecological receptors.

This CSM focuses specifically on TCE, which is the primary COPC with respect to the potential vapor intrusion pathway if present from the former Liberty Brass site. The CSM will be used to identify remedy relevant data gaps that will be addressed as part of the Supplemental Remedial Investigation.

4.1 Potential Sources

There are numerous commercial and industrial properties in the immediate vicinity of the Site which may represents potential sources besides the Former Liberty Brass Site which is the presumed source; however, this has not been confirmed.

4.1.1 Former Liberty Brass Site

The RIR and FER for the Former Liberty Brass Site indicate that a release of TCE took place in the vicinity of the loading dock at the northern portion of the site, entering subsurface media through floor drains resulting in relatively shallow soil contamination. All former on-site sources of contamination at the Former Liberty Brass Site have been treated, contained, and / or removed.

4.1.2 Upgradient Sources

Based upon the long history of industrial usage in the surrounding area, other regional upgradient sources of chlorinated aliphatic hydrocarbons (CAHs), including but not limited to TCE in groundwater and soil vapor, have potentially migrated beneath the Former Liberty Brass Site as well adjacent properties.

According to the above-referenced April 2015 Phase I ESA, at least two dry cleaners have been located in close proximity to, and hydraulically upgradient of, the Site including Kermallys Laundromat & Dry Cleaners, which was formerly located at 39-24 Queens Blvd., Anys Dry

Cleaners & Tailor, which is presently located at 39-45 47th Ave. and Sunnyside Acosta Cleaners, which is formerly located at 39-33 47th Ave.

In addition, it is generally understood that the presence of dissolved-phase TCE is ubiquitous in the upper glacial aquifer throughout most of New York City and can be attributed as a potential source to soil vapor. These lines of evidence indicate that groundwater containing dissolved-phase TCE that may still be present may be migrating onto the property of the Werwaiss Warehouse, from upgradient and crossgradient sources. In addition, no soil or groundwater investigation has been performed on the Site to determine if there are any on-site sources. In the northeast corner of the Liberty Brass site, an upgradient reactive barrier consisting of injections of emulsified vegetable oil and zero valent iron (EVO-ZVI) was installed to prevent on-site migration of TCE in groundwater from off-site sources located upgradient of the Former Liberty Brass Site.

4.1.3 Crossgradient Sources

Numerous other commercial and industrial properties in the immediate vicinity of the Site are also likely to have used and / or released chlorinated solvents to the sub-surface based on the nature of their prior industrial operations, and which may represent an additional potential source of TCE and other chlorinated solvents in the subsurface at the Site as detailed below.

4.1.3.1 Former Star Chromium Corp. / Star Metal Finishing Co.

Two nearby properties to the west / northwest have been historically utilized for electro-plating purposes by the same company under two different names, Star Chromium Corp. and Star Metal Finishing Co. (Former Star Chromium Sites). The Former Star Chromium Sites were located at 43-19 37th Street and 43-44 37th Street. The company operated the facility at 43-44 37th Street from approximately 1945 through 1947 and then relocated to 43-19 37th Street, where it operated the facility from approximately 1950 through 2006. The electro-plating process often involves the storage and utilization of chlorinated solvents, specifically during the pretreatment and cleaning stages. Long-term storage and utilization of chlorinated solvents may increase the likelihood of a release of solvents to the subsurface.

The former Star Chromium facility located at 43-19 37th Street was identified in 1980 as a RCRA Large Quantity Generator of spent plating bath solutions, plating bath residues and stripping and cleaning bath solutions. The former Star Chromium facility operated at this location from

approximately 1950 through 2006. Beginning in 1950, Sanborn maps indicate the presence of a dipping room at the rear and easternmost portion of the facility which is immediately adjacent to the 43-06 38th Street property.

4.1.3.2 Queens Health Center

The property located at 37-11 Queens Boulevard was identified as having been historically used for textile manufacturing in 1970. The manufacturing operations at this property were run by International Foam Products Inc. Textile manufacturing can involve the use of chlorinated solvents during manufacturing and cleaning stages of the process. 37-11 Queens Boulevard was also identified in 1993 as a RCRA Large Quantity Generator of ignitable waste and lead. No RCRA violations were identified.

4.1.3.3 Queens Health Center Development Site

The properties located at 43-40 and 43-06 38th Street are presently being redeveloped by the Queens Heath Center. Sanborn maps indicate that the 43-06 38th Street property was used for parking in 1947. The 1950 map does not indicate any buildings or usage other than the presence of wrecks in the portion of the property that abuts the former Star Chromium facility. Sanborn maps from 1970 through 2006 indicate that the 43-06 38th Street property was used for parking. Given the RCRA generator status for spent plating bath solutions, plating bath residues and stripping and cleaning bath solutions, the presence of a dipping room in the rear of the former Star Chromium facility throughout this time, and the presence of what appear to be three former doorways in the rear of the former Star Chromium facility that have since been abandoned, there is the potential for illegal dumping of chlorinated solvent waste to have taken place on the 43-06 38th Street property.

The above-referenced properties are shown on **Figure 2.**

4.2 Environmental Fate and Transport

Chemicals are transported or transformed in the environment through physical and kinetic processes. Physical processes including dissolution, vaporization, and adsorption result in the transfer the substances across media and phases. Kinetic processes, which include biotic and abiotic chemical transformations, decrease the concentration of a chemical by degrading it into other products. The current understanding of the fate and transport of chlorinated

hydrocarbon constituents is summarized below for each of the environmental media of interest at the Werwaiss Warehouse.

4.2.1 Soil

Soil sampling has not been performed at the Werwaiss Warehouse.

TCE may migrate in the subsurface as in soil gas, dissolved in groundwater, and / or through soil as a mobile dense non-aqueous phase liquid (DNAPL), which may adsorb to soil. The TCE-contaminated soil source areas at the Former Liberty Brass Site have been treated, contained, and removed to achieve a conditional Track 1 remedy. Soil was excavated to a depth of at least 20 ft bgs throughout the Former Liberty Brass Site, including in the vicinity of loading dock in the northern portion of the site. TCE-contaminated soil was removed to a depth of up to 37 ft bgs in the vicinity of the former vapor degreaser in the southeast portion of the Former Liberty Brass Site. Remaining contamination above the water table is being treated by the SVE system. Remaining contamination below the water table is being treated by in-situ chemical oxidation (ISCO).

4.2.2 Groundwater

Groundwater sampling has not been performed at the Werwaiss Warehouse.

The fate and transport mechanisms that affect groundwater include advection, dispersion, dissolution, and natural degradation which may work to reduce the concentration of any dissolved-phase chlorinated aliphatic hydrocarbon-related constituents in groundwater.

The results of groundwater sampling performed to date indicate the presence of dissolved-phase CAH-related constituents in groundwater above NYSDEC criteria in the vicinity of the Former Liberty Brass Site. Geochemical field and laboratory results indicate that natural attenuation of chlorinated aliphatic hydrocarbons has occurred in the past and is continuing to occur in groundwater. Groundwater samples indicated the presence of one site-related constituent, TCE, remaining in soil at the Former Liberty Brass Site at concentrations that exceed its applicable UUSCO as well as the Ambient Water Quality Standard (AWQS). Groundwater flows to the northwest at the Site.

As part of the Site Management Plan (SMP) for the Former Liberty Brass Site, groundwater monitoring is performed bi-annually at two downgradient monitoring wells to evaluate the

effectiveness of the remedial system at the Former Liberty Brass Site. TCE concentrations have decreased significantly at down gradient well W2 from 53 µg/L in January 2018 to 8.7 µg/L in January 2020 and at W5 from 56 µg/L in May 2019 to 14 µg/L in January 2020.

The greatest concentration of PCE observed in groundwater at the Former Liberty Brass Site since 2007 was 2 µg/L. A maximum PCE concentration of 0.57 µg/L was detected in a groundwater sample collected in 2015. A maximum PCE of 0.68 µg/L was detected in a groundwater sample collected as part of a Remedial Investigation performed in 2016. An estimated concentration of 0.3 µg/L PCE was detected in groundwater samples collected from W2 in January 2018 and May 2019. PCE was not detected in a groundwater sample collected from W5 in May 2019 and from W2 and W5 in January 2020.

4.2.3 Soil Vapor

CAH-related constituents in soil and dissolved-phase CAH-related constituents in soil and groundwater have the potential to volatilize and migrate and enter buildings through cracks and joints in foundation walls. Roadway utilities, tree pits, and other penetrations of the roadbed and / or sidewalk, have the potential to act as a preferential pathway for the migration of dissolved-phase chlorinated solvents constituents into the building in the vapor phase.

Sub-slab and indoor air sample results for each of the NYSDOH target constituents from the Off-Site Soil Vapor Investigation were evaluated using the applicable NYSDOH Matrix. The results of this initial sampling event indicated that no further action is recommended in connection with each of the NYSDOH target constituents with the exception of TCE. These vapors from on or off-site sources appear to have accumulated and become trapped beneath the slab and may have the potential to migrate into the building though cracks in the slab and / or foundation joints or other preferable pathways. According to the NYSDOH soil vapor intrusion decision making matrix, the TCE concentrations indicated at that time that mitigation is recommended. However, the conditional Track 1 remediation performed at the Former Liberty Brass Site has actively treated, contained, and / or removed the TCE-contaminated soil on that site since that time.

In addition, the remedial action for the Former Liberty Brass Site also included the installation of an SVE system to remove residual volatile organic compounds (VOCs) from the vadose zone in the onsite remaining contamination area and mitigate the potential for vapor intrusion

throughout the site. The SVE system was designed to physically remove volatile compounds in the vapor phase from the unsaturated zone throughout the building footprint, to mitigate the potential migration of vapors into the building from soil and / or groundwater and to prevent off-site soil vapor migration. The SVE system consists of two 2-inch diameter wells screened from approximately 28 ft bgs to approximately 48 ft bgs.

This SVE system is actively removing residual vapors from the sub-surface thereby preventing the off-site migration of vapors and mitigating the potential for soil vapor intrusion at the Werwaiss Warehouse for over two years. Concentrations of TCE in soil vapor at the Former Liberty Brass Site have decreased from 1600 µg/m3 in October 2018 to 500 µg/m3 in November 2019 and further to 310 µg/m3 in March 2020. However, concentrations of PCE, which were only 14 µg/m3 in October 2018 have increased to 730 µg/m3 in March 2020, potentially because the system is drawing off-site contamination toward the site and are being actively removed from the subsurface by the vacuum suction of the SVE system toward the Liberty Brass Site.

Field observations indicate that damaged concrete and linear cracks in the southern portion of the Werwaiss Warehouse may represent a potential pathway for the migration of sub-slab soil vapor to migrate into the building. The damaged concrete in the loading area in the southwest portion of the warehouse is limited to the southernmost 15-20 ft of the building and extends from the entrance of the loading gate on the western side of the building to approximately 45 ft to the east. Elevated PID readings were observed in the vicinity of some of the damaged areas. There are also several linear cracks in the southernmost 15-20 ft of the building that extend further east for another approximately 40 ft. These cracks range from several millimeters to up to approximately 2 cm in thickness

The locations of soil vapor extraction (SVE) system wells for the Former Liberty Brass Site are presented in **Figure 4.**

4.3 Potential Sensitive Receptors and Exposure Pathways

The primary potential exposure pathway for TCE is via inhalation. A complete exposure pathway is needed for a potential human or ecological health risk to be present. Based on the peer-reviewed principles of environmental risk assessment, there is no risk to a receptor when either (1) no receptor is present or (2) there is no complete exposure pathway for that receptor.

The building is comprised primarily of a warehouse built on a concrete slab. The tenant operations include storing and building crates, packing artworks, furniture, and other specialty items, receiving and releasing crates. The warehouse is almost entirely filled with packed crate storage with many permanent storage racks along the walls throughout the warehouse. There are three offices located in the northwest portion of the building, the northernmost of which overlies a small utility cellar. The tenant has five employees each of which spend approximately 3 out of 5 days each week in the building, either in the warehouse or the office. The warehouse loading gate is typically kept open except in the winter months when it is open intermittently. This practice frequently introduces outdoor air into the warehouse, which mitigates the potential for exposure. Concentrations of TCE in the indoor air samples collected in the Werwaiss Warehouse were 6 µg/m3, which, according to NYSDOH guidance, does not require immediate action.

The key objective of the remedial strategy presented herein is to further mitigate the exposure pathway for these potential receptors.

5.0 INTERIM REMEDIAL MEASURES WORK PLAN

5.1 Contemplated Future Use

There are presently no plans to redevelop the property into a different use.

5.2 Applicable Standards, Criteria, and Guidance – IRM

The applicable Standards, Criteria, and Guidance (SCGs) for this Site include:

- NYSDEC Division of Environmental Remediation Technical Guidance for Site Investigation and Remediation (DER-10),
- October 2006 / Amended May 2017 New York State Department of Health (NYSDOH) Guidance for Evaluating Soil Vapor Intrusion in the State of New York,
- June 2015 EPA Soil Vapor Intrusion Guidance Document,
- 6NYCRR Part 375 regulations,
- January 2007 ITRC Vapor Intrusion Pathway: A Practical Guideline, and
- 29 CFR Part 1910.120 - Hazardous Waste Operations and Emergency Response

5.3 IRM Objectives

As per Part 375-3.8(a), the chosen remedy shall be protective of public health and the environment with respect to indoor air.

5.3.1 Soil

Not Applicable

5.3.2 Groundwater

Not applicable

5.3.3 Soil Vapor

Mitigate potential impacts to public health resulting from existing, or the potential for, soil vapor intrusion into buildings.

5.4 General Response Actions

The following presents the general response action recommendations for each AOC based on the RI findings.

AOC 1 – SOIL VAPOR

A soil vapor extraction (SVE) system installed at the Former Liberty Brass Site is removing residual vapors from the sub-surface thereby reducing the off-site migration of vapors and minimizing the potential for soil vapor intrusion at the Werwaiss Warehouse.

The following additional actions will be performed to mitigate the potential for sub-surface vapors to enter the Werwaiss Warehouse building:

(1) Removal and replacement of the damaged concrete slab near the loading area in the southwest portion of the Warehouse,

(2) Sealing cracks in the slab in the southeast portion of the warehouse to the degree practicable using a non-Volatile Organic Compound (VOC) caulk and/or foam in slab cracks followed by the application of an epoxy layer or equivalent,

(3) Installation of suction pits and / vent wells to confirm the design of a sub-slab depressurization system (SSDS), if necessary, and performing communications testing which will have the added benefit of removing vapors that have accumulated beneath the slab, and

(4) Re-sampling of sub-slab and indoor air as part of a Supplemental Remedial Investigation to confirm that concentrations of sub-slab and indoor air vapors no longer require additional action pursuant to the NYSDOH Guidance Matrix.

Upon completion of the IRM, Chazen will prepare and an IRM CCR. Should sampling results indicate that additional action may be necessary, Chazen will work with NYSDEC to determine appropriate next steps.

6.0 SUMMARY OF SELECTED INTERIM REMEDIAL MEASURES

The proposed remedy achieves the remedial action objectives established for this Site. The remedial action is protective of the public health and environment, is compliant with remedial goals, SCGs, and RAOs, demonstrates short-term and long-term effectiveness, will result in the reduction of toxicity, mobility, and volume of contaminants through treatment, is implementable, cost effective, compatible with land use, and will generally be acceptable to the surrounding community.

The proposed IRM will consist of the following:

- Removal and replacement of approximately 800 sf of damaged concrete slab near the loading area in the southwest portion of the Warehouse,
- Observation of concrete removal and screening of excavated soil / fill during intrusive activities for indications of contamination by visual means, odor, and monitoring with a PID,
- Collection and laboratory analysis of confirmation soil samples for waste characterization purposes, if necessary,
- Appropriate off-Site disposal of all material removed from the Site in accordance with all Federal, State and local rules and regulations for handling, transport, and disposal,
- Sealing several linear cracks in the slab in the southeast portion of the Warehouse to the degree practicable using a non-Volatile Organic Compound (VOC) caulk and / or foam in slab cracks followed by the application of an epoxy layer or equivalent,
- Installation of approximately 3 to 4 suction pits and / vent wells. The suction pits will consist of screened 2 to 4-inch PVC pipe installed to a depth of approximately 2 ft bgs.

The horizontal vent well will consist of approximately 40 to 45 ft of screened 2 to 4-inch PVC pipe installed horizontally beneath the slab in the center of the loading area after the damaged concrete is removed and before the new concrete slab is poured,

- Performing communications testing by applying a vacuum at the section pits / vent wells and monitoring pressure at approximately 4 to 5 vacuum monitoring points located throughout the warehouse. The testing will be used to help determine and evaluate the permeability of the existing sub-surface soils under the concrete slab in order to confirm the design of a sub-slab depressurization system (SSDS), if necessary. The communications testing which will have the added benefit of removing vapors that have accumulated beneath the slab, and
- Re-sampling of sub-slab and indoor air at approximately 3 to 4 locations including at the previous sampling location, at two additional locations within the building, as well as at locations within the basement and one of the offices to confirm that concentrations of sub-slab and indoor air vapors no longer require additional action pursuant to the NYSDOH soil vapor intrusion decision making guidance.

Upon completion of the IRM, Chazen will prepare an IRM CCR. Should sampling results indicate that additional action may be necessary, Chazen will work with NYSDEC to determine appropriate next steps.

The remedy does not involve the importation of any fill material with the exception of gravel that will be used to surround the vent wells and suction pits. Should it be determined that fill is needed, the import of materials to be used for backfilling and cover would be performed in compliance with applicable chemical limits and other specifications as well as all Federal, State and local rules and regulations for handling and transport of material and the backfill requirements in DER-10.

Remedial activities will be performed at the Site in accordance with this NYSDEC-approved IRMWP. All deviations from the IRMWP will be promptly reported to NYSDEC for approval and fully explained in the CCR.

7.0 SUPPLEMENTAL REMEDIAL INVESTIGATION

7.1 Investigation Objective and Rationale

The Supplemental Remedial Investigation (SRI) objective is to refine the conceptual site model, determine whether any potential completed exposure pathways exist, and determine if any additional monitoring, mitigation, and / or remedial measures may be required to mitigate potential vapor intrusion at the Werwaiss Warehouse.

Investigation objectives will be met through the collection and field screening and laboratory analysis of confirmation sub-slab soil vapor and indoor samples for volatile organic compounds (VOCs) after the installation of the new concrete floor area. The conceptual site model described above will be refined as data are collected, and the new data are evaluated to assess the potential necessity for further studies and, if needed, to develop appropriate remedial action responses relative to NYSDEC and NYSHDOH objectives.

The field work outlined below, including project documentation, will be completed in accordance with this Work Plan and also provided as appendixes. All components of this Work Plan and associated Appendices have been prepared to be consistent with the general requirements of DER-10.

In order to meet the project objectives, and pursuant to discussions with NYSDEC, the following scope of work will be performed:

- Perform confirmation sub-slab and indoor air sampling at the Werwaiss Warehouse to evaluate the potential for soil vapor intrusion.

Additional details regarding the Supplemental RI scope of work are presented below.

7.2 Supplemental Remedial Investigation Scope of Work

7.2.1 Soil Vapor Intrusion Confirmation Testing

Samples will be collected in accordance with the Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York (NYSDOH October 2006) and SEPA Standard Operating Procedure (SOP) 2042, Soil Gas Sampling. Conditions in the field may require adjustment of sampling locations.

Following the completion of the remedial measures described above, Chazen will perform confirmation air quality sampling. A total of 11 air samples will be collected, including one duplicate sample. Samples would be collected from 5 sub-slab soil vapor sampling points in the warehouse, (including one previously sampled location,) one sub-slab soil vapor sampling point in the cellar, warehouse indoor air (co-located with the previously sampled location in the warehouse,) office indoor air, cellar indoor air, and ambient outdoor upwind air. The sub-slab soil vapor sampling ports will be installed to a depth of 2 inches beneath the existing building slab with a hammer drill, or other appropriate drilling method. The indoor air samples will be collected from 3 to 5 feet above the ground to represent the breathing zone. Sub-slab soil vapor and indoor air will be sampled concurrently, and sampling will occur for the duration of 8 hours.

Prior to sub-slab soil vapor sampling approximately two to three probe volumes will be purged at a flow rate less than 0.2 liters per minute. VOC concentrations will be recorded during purging utilizing a PID equipped with high eV bulb for detecting CVOCs. As part of the vapor intrusion evaluation, a tracer gas will be used in accordance with NYSDOH protocols to serve as a quality assurance/quality control (QA/QC) device to verify the integrity of the sub-slab soil vapor probe seal. Helium will be used as the tracer gas and a dome will serve to keep it in contact with the probe during testing. A portable monitoring device will be used to analyze a sample of soil vapor for the tracer prior to sampling. If the tracer sample results show a significant presence of the tracer, the probe seals will be adjusted to prevent infiltration. At the conclusion of the sampling event, tracer monitoring will be performed a second time to confirm the integrity of the probe seals.

Samples will be collected using 6-liter SUMMA® canisters. The laboratory will provide certified-clean canisters with an initial vacuum of approximately 26 inches of mercury (in. of Hg) for sample collection and flow regulators pre-set to provide uniform sample collection over an approximate 8-hour sampling period. Sample collection will be ceased (i.e., the valve on the canister closed) when approximately 2 in. of Hg vacuum remains in the canister, leaving a vacuum in the canister as a means for the laboratory to verify the canister did not leak while in transit. Samples will be analyzed for VOCs according to EPA method TO-15.

Proposed sampling locations are presented in **Figure 4.**

7.2.2 Qualitative Human Health Exposure Evaluation

A qualitative human health exposure assessment will be completed for the Site, characterizing if there are any current and future exposure pathways, and evaluating contaminant fate and transport. The Qualitative Human Health Exposure Assessment will follow DER-10, appendix 3B and Section 3.3 (b) 8.

7.2.3 Standards, Criteria, and Guidance – Supplemental RI

The chemical of potential concern (COPC) related to operations at the Former Liberty Brass Site is TCE. The results of soil vapor sampling will be evaluated using the May 2017 Updates to Soil Vapor / Indoor Air Decision Matrices for the Final NYSDOH CEH BEEI Soil Vapor Intrusion Guidance.

7.2.4 Quality Assurance Project Plan

See Section 8.1.2 below.

7.2.5 Data Reduction and Reporting

Following completion of the field work and laboratory analysis, laboratory analytical data will be submitted to a third party data validator who will conduct data validation and prepare a Data Usability Summary Report (DUSR) for the laboratory data. Validated analytical results will be compiled and compared to applicable standards, criteria, and guidance (SCGs). This information will be evaluated to refine the existing conceptual site model for contaminants of concern. Should this evaluation reveal significant data gaps, then a determination will be made whether to proceed with collection of additional data.

Upon completion of the IRM, Chazen will prepare and an IRM CCR. Should sampling results indicate that additional action may be necessary, Chazen will work with NYSDEC to determine appropriate next steps.

Electronic copies of the submittal will be submitted to the NYSDEC along with hard copies. Analytical results of the investigation will be submitted in the electronic data delivery (EDD) format through the Department's environmental information management system (EIMS).

7.3 References

1. NYSDEC, DER, December 2006, 6 NYCRR Part 375 Subpart 6, Remedial Program Soil Cleanup Objectives.

2. NYSDEC, DER, May 2010, DER-10 - Technical Guidance for Site Investigation and Remediation.
3. NYSDOH, October 2006, Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York.
4. USEPA, June 2015, Soil Vapor Guidance Document.
5. PVE Sheffler, LLC (PVES) & Lawrence Environmental Group, LLC (LEG), April 2015, Phase I Environmental Site Assessment Report.

8.0 INTERIM REMEDIAL MEASURE PROGRAM

8.1 Governing Documents

8.1.1 Site Specific Health & Safety Plan

The Site-Specific Health & Safety Plan (HASP) has been included as **Attachment A**. The HASP outlines the requirements for training, medical surveillance, daily tailgate meetings, emergency response, and accident and injury reporting.

The Chazen Field Team Leader will be responsible for implementing the HASP, completing the daily tailgate safety meetings and performing necessary Industrial Hygiene monitoring as specified in the HASP.

Subcontractors to Chazen or Liberty Brass / Ideal Trading Co. will have the option of adopting this HASP or developing their own Site-specific document. If a subcontractor chooses to prepare their own HASP, it must meet the minimum requirements as detailed in the Site HASP prepared by Chazen and must be made available to Chazen and NYSDEC.

Remedial work performed under this plan will be in full compliance with governmental requirements, including Site and worker safety requirements mandated by Federal OSHA and the Chazen Corporate Environmental Health and Safety policy. Modifications to the HASP may be made with the approval of the Chazen Health and Safety Manager and/or Project Manager.

The Volunteer and associated parties preparing the remedial documents submitted to the State and those performing the construction work, are completely responsible for the preparation of an appropriate Health and Safety Plan, and for the appropriate performance of work according to that plan and applicable laws.

The HASP and requirements defined in this IRMWP pertain to remedial and invasive work performed at the Site until the issuance of a Certificate of Completion.

Confined space entry will comply with applicable OSHA requirements to address the potential risk posed by combustible and toxic gasses.

8.1.2 Quality Assurance Project Plan

The Quality Assurance Project Plan (QAPP), included as **Attachment B**, presents the objectives, functional activities, methods, and quality assurance / quality control (QA/QC) requirements associated with sample collection and laboratory analysis for remedial activities. The QAPP follows requirements detailed in DER-10, Section 2.

The components of the QAPP include:

- Project Organization,
- Sampling requirements, including methodology, identification, quantity, volumes, locations, frequency, chain of custody procedures, and sample packaging,
- Field/Laboratory data control requirements,
- Equipment decontamination, and
- Field documentation.

8.1.3 Storm-Water Pollution Prevention Plan

Not Applicable.

8.1.4 Contractors Site Operations Plan

The Remedial Engineer will review plans and submittals for this remedial project (including those listed above and contractor and sub-contractor document submittals) and confirm that they are in compliance with this IRMWP. The Remedial Engineer is responsible to ensure that document submittals for this remedial project, including contractor and sub-contractor document submittals are in compliance with this IRMWP. Remedial documents will be submitted to NYSDEC and NYSDOH in a timely manner and prior to the start of work.

8.1.5 Document Repository

Document repositories have been established at the following location which contains applicable project documents:

Queens Sunnyside Library
Attn: Joseph Schiavone
43-06 Greenpoint Avenue
Long Island City, NY 11104
phone: 718-784-3033

8.2 General Remedial Construction Information

8.2.1 Remedial Engineer

The Remedial Engineer for this project will be Chris Lapine, P.E. The Remedial Engineer is a registered professional engineer licensed by the State of New York. The Remedial Engineer will have primary direct responsibility for implementation of the remedial program for the Former Liberty Brass Off-Site (NYSDEC BCA Site No. C241178A.) The Remedial Engineer will certify in the CCR that the remedial activities were observed by qualified environmental professionals under his supervision and that the remediation requirements set forth in the IRMWP and other relevant provisions of ECL 27-1419 have been achieved in full conformance with that Plan. Other Remedial Engineer certification requirements are listed later in this IRMWP.

The Remedial Engineer or qualified staff will review pre-remedial plans submitted by contractors for compliance with this IRMWP and the Remedial Engineer will certify compliance in the CCR.

8.2.2 IRM Construction Schedule

The estimated duration to complete the remedy is approximately two to three months following NYSDEC approval of the IRMWP. Confirmation sampling will be performed during the next heating season. Following approval of this IRMWP by the NYSDEC, a revised timeline with actual dates will be submitted.

8.2.3 Work Hours

The hours for operation of remedial construction will conform to the New York City Department of Buildings construction code requirements or according to specific variances issued by that agency. NYSDEC will be notified by the Responsible Party of variances issued by the Department of Buildings.

8.2.4 Site Security

Not applicable.

8.2.5 Traffic Control

Not applicable.

8.2.6 Contingency Plan

This contingency plan is developed for the remedial construction to address the discovery of unknown structures or contaminated media during excavation. Identification of unknown contamination source areas during invasive Site work will be promptly communicated to the NYSDEC Project Manager. Petroleum spills will be reported to the NYSDEC Spill Hotline. These findings will be included in the daily report. If previously unidentified contaminant sources are found during on-Site remedial excavation or development related excavation, sampling will be performed on contaminated source material and surrounding soils and reported to NYSDEC. Chemical analytical testing will be performed for Full List volatiles and semi-volatiles, pesticides/PCBs, and TAL/TCLP metals, as appropriate.

8.2.7 Worker Training and Monitoring

Remedial site workers will be required, at a minimum, to have completed 29 CFR 1910.120 HAZWOPER, Site safety training, and medical monitoring for Site workers. HAZWOPER training completion certificates will be submitted to the Remediation Engineer before commencement of Site work. Once the concrete slab is in place, HAZWOPER training will not be required of site construction workers.

8.2.8 Agency Approvals

No permits are required for this work.

8.2.9 Emergency Contact Information

An emergency contact sheet with names and phone numbers is included below.

Contact	Firm or Agency	Telephone Number
Police	108th Precinct - 5-47 50th Avenue, Long Island City NY	911 - (718) 784-5411
Fire	Ladder 116 - 37-20 29th St, Long Island City, NY 11101	911
Hospital	Mount Sinai Hospital Queens	(718) 932-1000
Ambulance		911
Project Manager / Health and Safety Manager	Richard T. Kampf, PG PWGC	(917) 280-6364
Health and Safety Officer	Sharon Froedden	(845) 486-1555
NYSDEC Site Contact	Sadique Ahmed	(518) 402 9656
Poison Control Center		(800) 962-1253
Chemtrec		(800) 424-9300

8.3 Site Preparation

8.3.1 Mobilization

Mobilization will include the delivery of construction equipment and materials to the Site. Site workers will receive Site orientation and training in accordance with the Site specific HASP and established policies and procedures to be followed during the implementation of remedial activities. The remediation contractor and associated subcontractors will each receive a copy of the IRMWP and HASP and will be briefed on their contents.

8.3.2 Erosion and Sedimentation Controls

Not applicable.

8.3.3 Stabilized Construction Entrance(s)

Not applicable.

8.3.4 Utility Marker and Easements Layout

The Responsible Party and its contractors are solely responsible for the identification of utilities within and exterior to the building that might be affected by work under the IRMWP and implementation of required, appropriate, or necessary health and safety measures during performance of work under this IRMWP. The Responsible Party and its contractors are solely responsible for safe execution of invasive and other work performed under this IRMWP. The Responsible Party and its contractors must obtain local, State or Federal permits or approvals

pertinent to such work that may be required to perform work under this IRMWP. Approval of this IRMWP by NYSDEC does not constitute satisfaction of these requirements.

8.3.5 Sheeting and Shoring

Not Applicable.

8.3.6 Equipment and Material Staging

Not Applicable.

8.3.7 Decontamination Area

Not applicable.

8.3.8 Site Fencing

Not Applicable.

8.3.9 Demobilization

Following the completion of remedial activities at the Site, equipment and remedial structures will be decontaminated and dismantled and removed from the Site. Sediment and erosion control measures and solid wastes generated during remedial activities (i.e., polyethylene sheeting) will be properly disposed of.

8.4 Reporting

Daily and monthly reports will be included in the CCR.

8.4.1 Daily Reports

Daily reports will be submitted to NYSDEC and NYSDOH Project Managers by the end of each day following the reporting period and will include:

- An update of progress made during the reporting day;
- Locations of work and quantities of material imported and exported from the Site;
- References to alpha-numeric map for Site activities;
- A summary of complaints with relevant details (names, phone numbers);
- Upcoming (planned) activities for the next workday;
- An explanation of notable Site conditions.

Daily reports are not intended to be the mode of communication for notification to the NYSDEC of emergencies (accident, spill), requests for changes to the IRMWP or other sensitive or time critical information. However, such conditions must also be included in the daily reports. Emergency conditions and changes to the IRMWP will be addressed directly to NYSDEC Project Manager via personal communication.

Daily Reports will include a description of daily activities keyed to an alpha-numeric map for the Site that identifies work areas. These reports will include a summary of air sampling results, odor and dust problems and corrective actions, and complaints received from the public.

The NYSDEC assigned project number will appear on reports.

8.4.2 Monthly Reports

Monthly reports will be submitted to NYSDEC and NYSDOH Project Managers within one week following the end of the month of the reporting period and will include:

- Activities relative to the Site during the previous reporting period and those anticipated for the next reporting period, including a quantitative presentation of work performed (i.e. tons of material exported and imported, etc.),
- Description of approved activity modifications, including changes of work scope and/or schedule,
- Sampling results received following internal data review and validation, as applicable, and,
- An update of the remedial schedule including the percentage of project completion, unresolved delays encountered or anticipated that may affect the future schedule, and efforts made to mitigate such delays.

8.4.3 Other Reporting

Remedial activities will be appropriately documented in a logbook maintained on-Site during the project duration and available for inspection by NYSDEC and NYSDOH staff. Photographs will be taken of remedial activities and submitted to NYSDEC in digital (JPEG) format. Representative photos will be provided of each contaminant source, source area and Site structures before, during, and after remediation. Photos will be submitted to NYSDEC on CD or other acceptable

electronic media. A photo log keyed to photo file ID numbers will be prepared to provide explanation for all representative photos.

8.4.4 Complaint Management Plan

Complaints from the public regarding nuisance or other Site conditions will be reported directly to the NYSDEC project manager and included in the daily reports.

8.4.5 Deviations from the IRMWP

In the event that remedial activities require deviation from the IRMWP due to unforeseen Site conditions, a detailed description of the conditions and required deviations from the IRMWP will be submitted to the NYSDEC project manager. The description will include the reasons that dictate deviation from the IRMWP, changes/editions to the IRMWP, and how the proposed remedy is affected.

9.0 INTERIM REMEDIAL MEASURES

The phased remedial approach to mitigate the potential for sub-surface vapors to enter the building consists of (1) the removal and replacement of a section of damaged concrete near the loading area in the southwest portion of the warehouse (across approx. 800 sf) and (2) sealing cracks in the slab in the southeast portion of the building (across approx. 1100 sf) to the degree practicable to mitigate the migration of vapors into the building. This will be followed by (3) the installation of suction pits and / or venting wells and performing communications testing to support the design of a sub-slab depressurization system. Vapors that have accumulated beneath the slab may be substantially reduced by both the removal and replacement of portions of the slab which will allow trapped vapors to freely escape as well as the communications testing process which will actively remove trapped vapors from the sub-surface. Following these activities, (4) sub-slab and indoor air will be re-sampled to confirm whether concentrations of sub-slab and indoor air vapors require additional action pursuant to the NYSDOH soil vapor intrusion decision making guidance.

Upon completion of the IRM, Chazen will prepare and an IRM CCR. Should sampling results indicate that additional action may be necessary, Chazen will work with NYSDEC to determine appropriate next steps.

9.1 Soil Cleanup Objectives

Not applicable.

9.2 Post-Excavation Documentation Soil Sampling

Not applicable. Should odors, staining, or other evidence off release of hazardous material be observed during remedial activities Chazen will coordinate with NYSDEC regarding the appropriate next steps.

9.3 Estimated Material Removal Quantities

The estimated quantity of concrete to be removed from the Site is approximately 600 cubic feet (22 cubic yards).

Figure 4 presents the proposed area on concrete slab that will be removed and replaced.

9.4 Soil/Materials Management Plan

It is anticipated that soil removed from the Site will be disposed as unregulated construction and demolition (C&D) debris unless odors, staining, or other evidence off release of hazardous material is observed during remedial activities. The Remediation Engineer will monitor and document the handling and transporting of material removed from the Site to a proper disposal facility. The Remediation Engineer will assist the remedial contractor in identifying impacted materials during excavation, determining materials suitable for direct load out versus temporary on-Site stockpiling, selection of samples for waste characterization, and determining the proper off-Site disposal facility.

9.4.1 Soil Screening Methods

There are no known contaminant sources. Visual, olfactory and PID soil screening and assessment will be performed by a qualified environmental professional during excavations into known or potentially contaminated material. Soil screening will be performed regardless of when the invasive work is done and will include excavation and invasive work performed during the remedy.

9.4.2 Stockpile Methods

Excavated soil may be stockpiled inside the building prior to disposal. Stockpiles will be inspected and results of inspections will be recorded in a logbook and maintained at the Site and available for inspection by NYSDEC.

Soil stockpiles outside the building will be encircled with silt fences, kept covered with appropriately anchored tarps, and routinely inspected. Damaged tarp covers will be promptly replaced. Hay bales will be used as needed near catch basins, surface waters and other discharge points.

9.4.3 Materials Excavation and Load Out

The Remedial Engineer or a qualified environmental professional under his/her supervision will oversee invasive work and the excavation and load-out of excavated material. It is anticipated that approximately 22 cubic yards of concrete (1 to 2 truckloads) and approximately 1 cubic yard of soil (approximately 1-2 drums) will be removed and disposed as part of the remedial activities. It is anticipated that this material will be disposed as unregulated construction and demolition (C&D) debris unless odors, staining, or other evidence off release of hazardous material is observed during remedial activities.

The Responsible Party and its contractors are solely responsible for safe execution of invasive and other work performed under this Plan.

The presence of utilities and easements on the Site will be investigated by the Remedial Engineer prior to slab removal and drilling activities to confirm that no risk is posed by utilities or easements on the Site by the planned work under this IRMWP.

Loaded vehicles leaving the Site will be appropriately lined, tarped, securely covered, manifested, and placarded in accordance with appropriate Federal, State, local, and NYSDOT requirements (and other applicable transportation requirements.)

Locations where vehicles enter or exit the Site shall be inspected daily for evidence of off-Site sediment tracking.

The Responsible Party and associated parties preparing the remedial documents submitted to the State, and parties performing this work, are completely responsible for the safe

performance of invasive work, the structural integrity of excavations, and for structures that may be affected by excavations (such as building foundations and bridge footings).

Mechanical processing of historical fill and contaminated soil on-Site isprohibited.

9.4.4 Materials Transport Off-Site

Transport of materials will be performed by licensed haulers in accordance with appropriate local, State, and Federal regulations, including 6 NYCRR Part 364. Haulers will be appropriately licensed and trucks properly placarded.

Trucks loaded with Site materials will exit the vicinity of the Site using only these approved truck routes. Truck operators are responsible for obeying traffic signs and detours.

Trucks will be prohibited from stopping and idling in the neighborhood outside the project Site.

Egress points for truck and equipment transport from the Site will be kept clean of dirt and other materials during Site remediation and development.

Queuing of trucks will be performed adjacent to the Site.

Material transported by trucks exiting the Site will be secured with tarps. If loads contain wet material capable of producing free liquid, truck liners will be used. Trucks containing hazardous materials will have watertight tarps.

9.4.5 Materials Disposal Off-Site

The total quantity of material expected to be disposed off-Site is approximately 22 cubic yards of concrete and 1-2 drums of soil to be disposed as unregulated construction and demolition (C&D) debris unless odors, staining, or other evidence off release of hazardous material is observed during remedial activities.

The CCR will include an accounting of the destination of material removed from the Site during this IRM, including excavated soil, contaminated soil, including contaminated historic fill, solid waste, and hazardous waste, non-regulated material, and fluids. Documentation associated with disposal of material must also include records and approvals for receipt of the material. This information will also be presented in a tabular form in the CCR.

Bill of Lading system or equivalent will be used for off-Site movement of non-hazardous wastes and contaminated soils. This information will be reported in the CCR.

Hazardous wastes derived from on-Site will be stored, transported, and disposed of in full compliance with applicable local, State, and Federal regulations.

Appropriately licensed haulers will be used for material removed from this Site and will be in full compliance with applicable local, State and Federal regulations.

Waste characterization will be performed for off-Site disposal in a manner suitable to the receiving facility and in conformance with applicable permits. Sampling and analytical methods, sampling frequency, analytical results and QA/QC will be reported in the IRM CCR. Data available for soil/material to be disposed at a given facility must be submitted to the disposal facility with suitable explanation prior to shipment and receipt.

9.4.6 Materials Reuse On-Site

Native material that meets the UUSCOs may be used as backfill on-site, if necessary. Documentation samples will be collected in the vicinity of the native material that will be a source of on-site reuse prior to backfilling.

9.4.7 Fluids Management

Liquids to be removed from the Site, including dewatering fluids, will be handled, transported and disposed in accordance with applicable local, State, and Federal regulations. Liquids discharged into the New York City sewer system will be addressed through approval by NYCDEP.

Dewatered fluids will not be recharged back to the land surface or subsurface of the Site. Dewatering fluids will be managed off-Site.

Discharge of water generated during remedial construction to surface waters (i.e. a local pond, stream or river) is prohibited without a SPDES permit.

9.4.8 Demarcation

Not applicable.

9.4.9 Backfill from Off-Site Sources

Materials proposed for import onto the Site will be approved by the Remedial Engineer and will follow provisions in this IRMWP prior to receipt at the Site. Backfill from off-site sources is not currently anticipated for the Site, with the exception of gravel that will be used to surround the vent wells and suction pits.

Material from industrial sites, spill sites, other environmental remediation sites or other potentially contaminated sites will not be imported to the Site. If sampling of material imported to the Site is required, sampling will be conducted in accordance with DER-10 Section 5.4. The NYSDEC will be consulted prior to importation of fill material.

The CCR will include the following certification by the Remedial Engineer: "I certify that import of soils from off-Site, including source evaluation, approval and sampling, has been performed in a manner that is consistent with the methodology defined in the IRMWP." A map detailing the locations of backfilled material, if any, will also be included in the CCR.

Imported soils will meet NYSDEC approved backfill or cover soil quality objectives for this Site. Non-compliant soils will not be imported onto the Site without prior approval by NYSDEC. Nothing in the approved IRMWP or its approval by NYSDEC should be construed as an approval for this purpose.

Soils that meet 'exempt' fill requirements under 6 NYCRR Part 360, but do not meet backfill or cover soil objectives for this Site, will not be imported onto the Site without prior approval by NYSDEC. Nothing in this IRMWP should be construed as an approval for this purpose.

Solid waste will not be imported onto the Site.

Trucks entering the Site with imported soils will be securely covered with tight fitting covers.

9.4.10 Contingency Plan

If underground tanks or other previously unidentified contaminant sources are found during on-Site remedial excavation or development related construction, sampling will be performed on product, sediment and surrounding soils, etc. Chemical analytical work will be for full scan parameters (TAL metals, TCL volatiles and semi-volatiles, TCL pesticides and PCBs). These analyses will not be limited to STARS parameters where tanks are identified without prior approval by NYSDEC. Analyses will not be otherwise limited without NYSDEC approval.

Identification of unknown or unexpected contaminated media identified by screening during invasive Site work will be promptly communicated by phone to NYSDEC's Project Manager. These findings will be also included in daily and periodic electronic media reports.

9.4.11 Community Air Monitoring Plan

The work will be performed indoors while workers are not present. Therefore, a community air monitoring program is not required, as per discussions with the NYSDEC Project Manager.

10.0 IRM – ENGINEERING AND INSTITUTIONAL CONTROLS

Engineering and Institutional Controls (ECs and ICs) will be utilized to ensure the protection of human health and the environment under current and future conditions.

10.1 Engineering Controls

10.1.1 Composite Cover System

The composite cover system is a permanent control and the quality and integrity of this system will be inspected as necessary as determined by the Project Engineer.

Soil vapor that has accumulated beneath the slab may be an ongoing source of soil vapor intrusion into the building. The intent of this remedial is to reduce the amount of soil vapor beneath the slab and to reduce the potential for any remaining soil vapor to enter the building through soil vapor intrusion. The remedy will involve the removal and replacement of a damaged portion of the concrete slab (approximately 800 sf) in the southwestern portion of the building and sealing of cracks across approximately 1100 sf in the southeastern portion of the building to mitigate the migration of vapors into the building.

Maintenance of this composite cover system will be described in the CCR.

10.2 Institutional Controls

10.2.1 Environmental Easement

Not applicable.

11.0 IRM CONSTRUCTION COMPLETION REPORT

An IRM Construction Completion Report (CCR) will be submitted to NYSDEC following implementation of the IRM defined in this IRMWP. The IRM CCR provides the documentation that the remedial work required under this IRMWP has been completed and has been performed in compliance with this plan. The IRM CCR will provide a comprehensive account of the locations and characteristics of all material removed from the Site including the surveyed map(s) of sources. The IRM CCR will include as-built drawings, constructed elements,

certifications, manifests, and bills of lading. The IRM CCR will provide a description of the changes in from the elements provided in the IRMWP and associated design documents. The IRM CCR will provide a tabular summary of performance evaluation sampling results and material characterization results and other sampling and chemical analysis performed as part of the IRM. The IRM CCR will provide test results demonstrating that mitigation and remedial systems are functioning properly. The IRM CCR will be prepared in conformance with DER-10. The IRM CCR will include written and photographic documentation of remedial work performed under this remedy.

The IRM CCR will include an accounting of the destination of material removed from the Site, including excavated contaminated soil, including contaminated historic fill, solid waste, hazardous waste, non-regulated material, and fluids, if any. Documentation associated with disposal of material must also include records and approvals for receipt of the material. It will provide an accounting of the origin and chemical quality of material imported onto the Site.

Before approval of the IRM CCR, project reports must be submitted in digital form on electronic media (PDF.)

12.0 CERTIFICATIONS

The following certification will appear in front of the Executive Summary of the CCR. The certification will be signed by the Remedial Engineer, Chris Lapine, P.E., who is a Professional Engineer registered in New York State This certification will be appropriately signed and stamped. The certification will include the following statements:

I Chris Lapine, P.E., certify that I am currently a NYS registered professional engineer, I had primary direct responsibility for the implementation of the subject construction program, and I certify that the IRM WP was implemented and that all construction activities were completed in substantial conformance with the DER-approved IRMWP. The data submitted to DER demonstrates that the remediation requirements set forth in the IRMWP and all applicable statutes and regulations have been or will be achieved in accordance with the time frames, if any, are established in the IRMWP.

13.0 SCHEDULE

The following tasks and the anticipated timeframe to complete are as follows:

Remedial work removal and replacement of concrete slab in the southwest portion of the warehouse, sealing cracks in the slab in the southeast portion of the warehouse, installation of suction pits will begin within four weeks of NYSDEC approval of the IRMWP, assuming the work is deemed an essential service by the State of New York to protect public health. It is preferable to perform this work at this time since the Warehouse is not occupied by staff during the COVID-19 quarantine. It is anticipated that the concrete and crack repair work and installation of the horizonal vent well work will be completed within approximately one to two weeks. The remaining suction pits will be installed as soon as possible pending access to those locations. The communications testing will be completed prior to the heating season. Confirmation sampling of sub-slab and indoor air will be performed during the heating season. The CCR will be submitted by the end of the year 2020.

FIGURES

ATTACHMENT A
HEALTH AND SAFETY PLAN

ATTACHMENT B
QUALITY ASSURANCE PROJECT PLAN