SECOND FIVE-YEAR REVIEW REPORT FOR JACKSON STEEL SUPERFUND SITE MINEOLA, TOWN OF NORTH HEMPSTEAD NASSAU COUNTY, NEW YORK

Prepared by

U.S. Environmental Protection Agency
Region 2
New York, New York
May 2017

John Prince, Acting Director
Emergency and Remedial Response Division

May 18, 2017
Date

510516

TABLE OF CONTENTS

LIST OF ABBREVIATIONS & ACRONYMS

CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
COCs	contaminants of concern
1,2-DCE	1,2-dichloroethene
EPA	United States Environmental Protection Agency
ESD	Explanation of Significant Differences
FS	Feasibility Study
FYR	Five-Year Review
HI	Hazard Index
IC	Institutional Control
ICIAP	Institutional Control Implementation and Assurance Plan
ISVE	in-situ vapor extraction
IRIS	Integrated Risk Information System
MCLs	Maximum Contaminant Levels
$\mu g/m^3$	micrograms per cubic meter
NCHD	Nassau County Health Department
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OU	Operable Unit
PCE	tetrachloroethylene
RAO	Remedial Action Objectives
RI	remedial investigation
ROD	Record of Decision
RPM	Remedial Project Manager
SDS	subslab depressurization system
TCA	trichloroethane
TCE	trichloroethylene
VIMP	Vapor Intrusion Management Plan
VISL	Vapor Intrusion Screening Level
VOC	volatile organic compounds

I. INTRODUCTION

The purpose of a five-year review (FYR) is to evaluate the implementation and performance of a remedy in order to determine if the remedy is and will continue to be protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in FYR reports such as this one. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The U.S. Environmental Protection Agency (EPA) is preparing this FYR pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, consistent with the National Contingency Plan (NCP)(40 CFR Section 300.430(f)(4)(ii)), and considering EPA policy.

Although the remedial action at this site will not leave hazardous substances, pollutants, or contaminants above levels that allow for unlimited use and unrestricted exposure, a policy FYR is required due to the fact that the remedial action requires five or more years to complete. This is the second FYR for the Jackson steel Superfund site. The triggering action for a subsequent FYR is the signature date of the last review. The trigger for this FYR is August 15, 2012, the approval date of the last review.

The site is being addressed as a single operable unit (OU), which is the subject of this FYR.

The Jackson steel Superfund site FYR was led by Christos Tsiamis, the EPA Remedial Project Manager (RPM). Participants included Kathryn Flynn (EPA hydrogeologist), Nick Mazziotta (EPA human-health risk assessor), Michael Clemetson (EPA ecological risk assessor), and Cecilia Echols (EPA community involvement coordinator). The FYR began on February 16, 2017.

Site Background

The 1.5-acre Jackson Steel site, located at 435 First Street in Mineola, Town of North Hempstead, Nassau County, New York, contains a vacant, one-story 43,000-square-foot building formerly used as a metal-forming facility and an approximately 10,000-square foot paved parking area. The building consists of two sections—the original building, constructed in 1959, is located closer to First Street, and the newer section, which was added in 1963, is at the rear. The former office space is located along the north wall, and a loading dock is located in the southwest corner of the front section of the building. An old vertical aboveground storage tank—possibly used to store degreasing substances—is situated in the front section of the building next to the former offices. A trench is located in the floor along the inside western wall of the building extension, above which a degreasing station is suspected to have been located. Two sumps are located in the front section of the building behind the former office space. One sump is located under the heater and the other one is located along the eastern wall of the main building. A third sump is located outside the building, near the main entrance.

The property is zoned B-1 for business use and retail or office space. The site is bordered to the north by commercial and single-family dwellings, to the east by multiple-family dwellings in a

two-story apartment complex, to the south by the Learn and Play Daycare Center and a future exercise studio (renovations to the former retail store/daycare center are currently underway) and to the west by an office building and restaurant. Herricks Road to the west has predominantly commercial properties on both sides of the heavily-traveled road. See Figure 1 for a site plan.

Appendix B, attached, summarizes the site's topography, geology/hydrogeology, and land and resource use

History of Contamination

The property was used from the mid-1970s until 1991 as a "roll form metal shapes" manufacturing facility. Degreasers, including tetrachloroethylene (PCE), trichloroethylene (TCE), and 1,1,1-trichloroethane (TCA), were used at the facility until 1985. Sludges from degreasing equipment were stored in drums and in an on-property 275-gallon tank.

The analytical results from samples collected by the Nassau County Department of Health (NCHD) in the early 1990s from within, around, and below three on-property dry wells indicated the presence of volatile organic compounds (VOC) at depths down to 40 feet below the ground surface. VOCs were also detected in groundwater samples collected from monitoring wells located downgradient of the dry wells.

Dumping of wastes into the dry wells and spills and leaks from drums storing various chemicals during the facility's operations are the likely sources of the contamination found at the site.

Initial Response

In October 1999, the site was proposed for placement on EPA's Superfund National Priorities List (NPL). On February 4, 2000, the site was listed on the NPL.

Following commencement of remedial investigation (RI)-related field work in October 2001, because of concerns about the proximity of the site to a daycare center, NCHD performed air sampling inside the daycare center building. The air samples detected PCE at levels below the New York State Department of Health's (NYSDOH's) guideline for indoor PCE exposure. Given the sensitivity of the population exposed (preschool children), NCHD collected additional samples in December 2001. At that time, indoor air testing was also conducted inside the former Jackson Steel building and a restaurant located adjacent to the site. The results indicated that PCE levels in the indoor air of several rooms in the daycare center were above NYSDOH's guideline for indoor PCE exposure. As a result, in January 2002, a subslab depressurization system (SDS) was installed at the daycare center by EPA. In addition, a ventilation system was installed by the daycare center's contractor. Samples collected to assess the effectiveness of the measures implemented showed that the PCE levels in the air were significantly below NYSDOH's guideline and below EPA's acceptable benchmarks.

Because elevated PCE levels were also detected in a billiards club building that shared common walls with the site building and the daycare center, EPA installed an SDS system under the concrete slab of this building, as well. Subsequently, a retail store occupied the space and then the

daycare center expanded into it. Presently, it is being renovated to become an exercise studio. Because they were nearing the end of their useful lives, both of the vapor intrusion mitigation systems that were installed by EPA were replaced by the property owner's contractor in May 2016.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site Name: Jackson Steel Superfund Site		
EPA ID: NYD001344456		
Region: 2	**State:** NY	**City/County:** Mineola/Town of North Hempstead/ Nassau County
SITE STATUS		
NPL Status: Deleted		
Multiple OUs? Yes	**Has the site achieved construction completion?** Yes	
REVIEW STATUS		
Lead agency: EPA ***[If "Other Federal Agency", enter Agency name]*:**		
Author name (Federal or State Project Manager): Christos Tsiamis		
Author affiliation: EPA		
Review period: 8/16/2012 - 5/5/2017		
Date of site inspection: 3/20/2017		
Type of review: Policy		
Review number: 2		
Triggering action date: 8/15/2012		
Due date *(five years after triggering action date)*: 8/15/2017		

II. RESPONSE ACTION SUMMARY

Basis for Taking Action

The results of the RI, which was completed in 2002, indicated that VOCs, semi-volatile organic compounds, pesticides, and metals contamination were present in the surface soil and VOC contamination was present at several subsurface soil locations. In addition, contamination was found in a trench and sumps located inside the building and dry wells located under the parking lot at the site.

Groundwater from the three hydrogeologic units underlying the site—the Upper Glacial Aquifer (upper aquifer), Magothy Confining Bed (a low permeability, clay layer separating the upper and deep aquifers), and the Magothy Aquifer (deep aquifer)—were also sampled. VOC contamination above state and federal standards was detected both in the Upper Glacial Aquifer and Magothy Aquifer.

Because the property includes a mostly paved industrial/commercial facility, it was concluded that there was minimal habitat available for ecological receptors on the property. Due to the suburban/commercial setting, it was also concluded that the potential for exposure to receptors and ecological risk was minimal in the area surrounding the property, as well. A screening of ecological risks was, however, performed. This screening concluded that VOC contamination in the surface soil posed a potential unacceptable risk to burrowing animals that may come into contact with these soils.

Response Actions

Following the completion of the RI/feasibility study, a Record of Decision (ROD) for the site was issued on September 24, 2004.

The following remedial action objectives (RAOs) were established for the site:

- Minimize or eliminate contaminant migration from contaminated soils and dry wells to the groundwater;
- Minimize or eliminate any contaminant migration from contaminated soils and groundwater to indoor air;
- Restore groundwater to levels which meet state and federal standards within a reasonable time frame;
- Mitigate the migration of the affected groundwater; and
- Reduce or eliminate any direct contact, ingestion, or inhalation threat associated with contaminated soils, soil vapor, contaminated surfaces in the on-property building, and groundwater.

The major components of the selected remedy as described in the ROD, as modified by a 2007 Explanation of Significant Differences (ESD),[1] include:

- decontamination of the former Jackson Steel building floor;
- *in-situ* soil vapor extraction (ISVE)[2] to treat the contaminated subsurface soil;
- excavation and off-site disposal of the contaminated surface soil and contaminated material in on-site sumps, a trench, and dry wells; and
- *in-situ* chemical oxidation[3] to treat the contaminated groundwater in the Upper Glacial Aquifer.

The soil cleanup objectives were established pursuant to New York State Technical and Administrative Guidance Memorandum No. 94-HWR-4046 objectives (Division Technical and Administrative Guidance Memorandum: Determination of Soil Cleanup Objectives and Cleanup Levels, Division of Hazardous Waste Remediation, January 24, 1994) (TAGM). These levels were the more stringent cleanup level between a human-health protection value and a value based on protection of groundwater. The groundwater cleanup goals were the more stringent of the state or federal promulgated standards. EPA and NYSDOH promulgated health-based protective Maximum Contaminant Levels (MCLs) are enforceable standards for various drinking water contaminants. MCLs ensure that drinking water does not pose either a short- or long-term health risk.

Status of Implementation

The building decontamination and the excavation of the contaminated surface soil and the contaminated material in the building sumps, trench, and dry wells and their disposal were performed from 2005 to 2006. A total of 170 cubic yards of material was excavated and disposed of at an EPA-approved off-site facility.

The *in-situ* chemical oxidation component of the remedy was implemented in 2005. Approximately, 15,000 gallons of iron-catalyzed sodium persulfate (with small amounts of buffering agents) and 600 gallons of hydrogen peroxide were injected in the aquifer through a network of 20 injection wells to treat the contamination in the Upper Glacial Aquifer.

[1] The selected remedy included the extraction and treatment of the contaminated groundwater in the deep aquifer underneath the site if confirmatory groundwater sampling indicated that the site was the source of the groundwater contamination to this aquifer. Because the groundwater investigation concluded that there were multiple unknown upgradient contaminant sources and that the site was not a current, significant source of the contamination in the deep aquifer, EPA decided not to implement the extraction and treatment of the contaminated groundwater in the deep aquifer component of the groundwater remedy. This modification to the remedy was documented in the 2007 ESD.

[2] ISVE involves drawing air through a series of wells to volatilize the solvents in the soils. The extracted vapors are then treated and released to the atmosphere.

[3] Under this technology, an oxidizing agent is injected into the contaminated groundwater. An oxidizing agent uses oxygen to degrade VOCs.

After a successful pilot test, an ISVE system consisting of nine ISVE wells and 11 vapor monitoring probes began operating in 2005.

While the cleanup objectives for the Upper Glacial Aquifer and soil were met in 2006 and 2008, respectively, EPA continued to operate the ISVE system until 2013, because VOC vapors were still being recovered from underneath the former Jackson Steel building. The operation of the ISVE system was discontinued when the levels of vapor removal became too low for the system to continue to be efficient. The aboveground ISVE infrastructure was removed by EPA in June 2013. From March to April 19, 2016, the groundwater monitoring wells, ISVE wells, vapor monitoring wells, ISCO injection wells, and ISCO monitoring wells, were decommissioned.

Although soil cleanup levels have been met, residual levels of VOCs remain that have the potential to migrate into buildings. Because the residual levels of VOCs are expected to dissipate slowly, EPA concluded that preventing human exposure to VOCs at the former Jackson Steel building and daycare center (now, including the future exercise studio) will be needed for a number of years to ensure the protectiveness of the remedy. Therefore, the existing vapor intrusion mitigation systems at the daycare center and future exercise studio will continue to operate and additional actions, from monitoring to the installation of an additional vapor mitigation system, may be needed should the currently unoccupied former Jackson Steel building be occupied or replaced with another structure in the future. EPA determined that institutional controls (ICs) requiring the continued operation of the subslab vapor intrusion mitigation systems were needed. In addition, EPA determined that ICs requiring vapor intrusion sampling and/or mitigative measures were needed should the unoccupied former Jackson Steel building be occupied or replaced with another structure in the future.

EPA issued an ESD on June 20, 2016, documenting its determination to incorporate into the remedy ICs to prevent exposure through vapor intrusion.[4] The ICs will remain in place until the residual VOCs fully dissipate in the subsurface. EPA noted in the ESD that a Vapor Intrusion Management Plan (VIMP) and Institutional Control Implementation and Assurance Plan (ICIAP) would be prepared to ensure that the ICs were appropriately implemented and maintained. In addition, in the ESD EPA noted that it would communicate directly with the Village of Mineola Superintendent of Buildings, requesting that EPA and New York State Department of Environmental Conservation (NYSDEC) be notified if the existing building is to be refurbished and used for human occupancy or demolished and a new structure constructed. The correspondence would also request that the Village not issue a Certificate of Occupancy until necessary vapor intrusion-related actions identified by EPA and NYSDEC are carried out.

A VIMP and ICIAP were completed on June 20, 2016.

The site was deleted from the NPL on September 26, 2016.

Appendix C, attached, provides supplemental information.

[4] The ICs that were ultimately put into place identify the addresses of the two buildings, not the usage of the buildings.

Institutional Controls

As was noted above, EPA incorporated into the remedy ICs requiring the continued operation of the two subslab vapor intrusion mitigation systems as long as elevated levels of vapors remain under the buildings and the building is occupied. In addition, EPA incorporated into the remedy ICs calling for vapor intrusion sampling and/or mitigative measures should the unoccupied former Jackson Steel building be occupied or replaced with another structure in the future.

Table 1, below, summarizes the implemented ICs. For more details, see Appendix D, attached.

Table 1: **Summary of Implemented Institutional Controls**

Media, engineered controls, and areas that do not support UU/UE based on current conditions	ICs needed?	ICs called for in the decision documents?	Impacted Parcel(s)	IC Objective	Title of IC Instrument Implemented and Date (or planned)
indoor air	yes	yes	former Jackson Steel building	prevent exposure to VOCs in indoor air	deed notice filed on July 27, 2016
indoor air	yes	yes	daycare center and future exercise studio	prevent exposure to VOCs in indoor air	deed notice filed on July 27, 2016
indoor air	yes	yes	former Jackson Steel building	prevent exposure to VOCs in indoor air	June 20, 2016 notification letter sent to Superintendent of Buildings

Systems Operation/Operation & Maintenance

Because groundwater standards had been met for several years subsequent to the ISCO injections and air oxidation, groundwater sampling was discontinued after the September 2011 sampling event.

Vapor intrusion monitoring at the Jackson Steel building, daycare center, and former retail store/daycare center (future exercise studio) is performed annually during the heating season. Fourteen subslab samples and 15 indoor air samples are collected.

EPA maintained the subslab mitigation systems until they were replaced by the property owner's contractor in May 2016. That contractor is now performing the maintenance of the systems. Periodic inspections were/will be performed to verify the mitigation systems are operating as designed. Specifically, the fans are observed during operation to see if there are any abnormal noises, buzzing, scraping, or no sound at all; system piping and connections are inspected for any breach or damage; slab/system interface seals are inspected for breaches; system differential

pressure gauges are checked for functionality; the pressure differential readings are checked to insure that the differential pressure is in the acceptable range; and the electrical components are inspected for damage.

During this review period (2013-2017), subslab soil gas samples were collected during the heating season from under the former Jackson Steel building, daycare center, and former retail store/daycare center. Indoor air samples were also collected from the daycare center and former retail store/daycare center during four of the years (2013-2016). In 2017, subslab soil gas samples were collected from under the former Jackson Steel building and daycare center and from the indoor air of the daycare center. The former retail store/daycare center could not be sampled because it was being renovated at the time (it is being converted to an exercise studio). The 2017 sampling results were not available to be assessed during this review period. Each sample was analyzed for select VOCs including PCE, TCE, cis/trans-1,2-dichloroethene (1,2-DCE), 1,1,1-TCA, 1,2-dichloroethane, and 1,1-dichloroethane.

Potential impacts on the site from climate change were assessed. The performance of the remedy is currently not at risk due to the expected effects of climate change in the region near the site.

III. PROGRESS SINCE THE LAST REVIEW

This section provides the protectiveness determinations and statements from the last FYR, as well as any recommendations from the last FYR and the current status of those recommendations.

Table 2, below, provides the OU1 and site-wide protectiveness determinations and statements from the 2012 FYR.

Table 2: **Protectiveness Determinations/Statements from 2012 Five-Year Review**

OU	Protectiveness Determination	Protectiveness Statement
01	Protective	The implemented actions at the site protect human health and the environment. Currently, there are no exposure pathways that could result in unacceptable risks and none are expected as long as the site use does not change and the vapor mitigation systems continue to be properly operated, monitored, and maintained.
Sitewide	Protective	The implemented actions at the site protect human health and the environment. Currently, there are no exposure pathways that could result in unacceptable risks and none are expected as long as the site use does not change and the vapor mitigation systems continue to be properly operated, monitored, and maintained.

There were no recommendations or follow-up actions stemming from the first FYR.

IV. FIVE-YEAR REVIEW PROCESS

Community Notification, Involvement & Site Interviews

On November 14, 2016, EPA Region 2 posted a notice on its website indicating that it would be reviewing site cleanups and remedies at 38 Superfund sites in New York and New Jersey, including the Jackson Steel site. The announcement can be found at the following web address:

https://www.epa.gov/sites/production/files/2016-11/documents/five_year_reviews_fy2017_final.pdf.

In addition to this notification, a notice of the commencement of the FYR was posted on EPA's Region 2 website and sent to local public officials. The purpose of the public notice was to inform the community that EPA would be conducting a FYR to ensure that the remedy implemented at the site remains protective of public health and is functioning as designed. In addition, the notice included contact information, including addresses and telephone numbers, for questions related to the FYR process or the site. Once the FYR is completed, the results will be made available at the site information repositories. The information repositories are located at:

EPA
290 Broadway, 18th Floor
New York, New York 10007

Town of North Hempstead
200 Plandome Road
Manhasset, NY 11030

Garden City Public Library
60 Seventh Street
Garden City, NY 11530

Village of Mineola Hall
155 Washington Avenue
Mineola, NY 11501

In addition, efforts will be made to reach out to stakeholders and local public officials to inform them of the results.

Data Review

For this review, the existing subslab results for the Jackson Steel and retail store facilities were compared to the most recent (May 2016) EPA commercial Vapor Intrusion Screening Levels (VISLs) reflecting a cancer risk of 10^{-6} (one in a million) and noncancer hazard index (HI) of 1. Indoor air results were also compared to the NYSDOH ambient air guideline values. The NYSDOH values for PCE and TCE are more stringent than the respective EPA commercial VISLs for indoor air. Subslab and indoor air results for the daycare were compared to the EPA residential VISLs to account for exposures to young children, which are considered to be a sensitive

subpopulation. The VISLs and NYSDOH guidelines referenced for this evaluation are indicated in Table 3, below.

Table 3: Vapor Intrusion Screening Levels and NYSDOH Guidelines

Evaluation Criteria	PCE	TCE
Subslab (µg/m3)		
EPA VISL (commercial)	1,600	100
EPA VISL (residential)	360	16
Indoor Air (µg/m3)		
EPA VISL (commercial)	47	3
EPA VISL (residential)	11	0.48
NYSDOH Ambient Air	30	2

PCE and TCE are the primary focus of this review because they are the only chemicals to exceed the applicable EPA subslab and indoor air VISLs, as well as the NYSDOH guideline values. Although EPA VISLs and NYSDOH values are not available for 1,2-DCE, this compound was identified in the subslab at the same locations as PCE and TCE and at significantly lower concentrations. 1,2-DCE was not detected in indoor air.

In 2012, the maximum subslab PCE and TCE concentrations for the Jackson Steel Building were 4,800 and 250 µg/m^3, respectively. Sporadic detections of PCE and TCE were identified within subslab air at the daycare center and retail store at levels below 140 µg/m^3 for PCE and 10 µg/m^3 for TCE. Indoor air results were consistently below NYSDOH guidelines and EPA VISLs, indicating the effectiveness of the subslab mitigation systems. Although PCE and TCE remained elevated at select locations, the previous FYR (August 2012) reported decreasing concentration trends overall. As a result, the ISVE system was decommissioned in June 2013, when vapor concentrations beneath the slab became too low for the system to remain efficient.

Since the removal of the ISVE system, PCE and TCE concentrations in the subslab have increased throughout the entire Jackson Steel building footprint. In 2015, PCE was detected at all nine subslab locations at levels ranging from 38 to 7,600 µg/m^3. Concentrations above the EPA commercial VISL (1,600 µg/m^3) were identified at all but three locations. TCE was detected at seven locations, although only the maximum (260 µg/m^3) concentration exceeded the EPA commercial VISL. The one subslab sample collected within the former retail store/daycare center contained PCE and TCE at 4,900 and 290 µg/m^3, respectively; each considerably higher than concentrations indicated during ISVE operation. PCE was detected in all five subslab sample locations within the daycare center at concentrations ranging from 1.1 to 2,500 µg/m^3. Four samples exceeded the residential VISL. TCE was also detected at these four locations, each above the residential VISL, ranging from 45 to 120 µg/m^3. The maximum PCE and TCE concentrations were collocated within each facility footprint. Despite increasing subslab levels, no analyte exceeded the respective NYSDOH guideline or EPA commercial/residential VISLs for indoor air. All PCE detections were less than 1.2 µg/m^3 and no TCE detections were observed. The TCE reporting limit (0.21 µg/m^3) was also below the EPA residential VISL.

Subslab concentrations continued to rise in 2016. Under the Jackson Steel building, PCE was detected at each location between 92 and 6,200 µg/m^3. Although the maximum value decreased from 2015, there was an overall increase at every other location. Seven locations exceeded the EPA commercial VISL, including six with PCE above 3,000 µg/m^3. TCE was also detected at every subslab location in the Jackson Steel building, compared to just four locations the year prior. Two samples exceeded the EPA commercial VISL, with a maximum concentration of 250 µg/m^3. Within the former retail store/daycare center, PCE was observed at 7,300 and 8,300 µg/m^3 over two sampling events conducted in February and March of 2016, respectively. TCE, detected at 340 and 380 µg/m^3, was also shown to increase. PCE and TCE were detected at each location within the daycare facility as well with maximum concentrations of 4,800 and 200 µg/m^3, respectively. Four locations exceeded the residential subslab VISLs for each chemical. Although PCE was widely detected within indoor air, the levels identified were below the EPA residential VISL and NYSDOH guideline. The maximum PCE concentration (4.8 µg/m^3), identified in the daycare, does indicate a slight increase in indoor air concentrations from 2015. This trend will be further evaluated as monitoring continues and when the 2017 data becomes available for review. TCE, on the other hand, was generally not detected. The maximum concentration was 0.32 µg/m^3, which is below the EPA residential VISL and NYSDOH guideline.

In summary, while subslab soil gas vapor concentrations at a number of locations exceeded the EPA VISLs for PCE and TCE, such exceedances are only an indication that an indoor air problem may exist. All of the indoor air samples collected during the review period, however, were significantly below the NYSDOH ambient air guidelines and the applicable EPA thresholds. Although increasing subslab concentrations were observed, this trend was considered likely after the ISVE system was decommissioned in 2013. Nevertheless, the indoor air results were consistently below NYSDOH guidelines and EPA VISLs, indicating the effectiveness of the subslab mitigation systems. Subslab concentrations are expected to decrease over time as any residual VOCs in the subsurface continue to fully dissipate, as documented by the 2016 ESD.

Site Inspection

Concurrent with vapor intrusion sampling, an inspection of the site was conducted on March 20, 2017 by Mark Denno of the EPA Superfund Support Team. During the inspection, it was noted that four of the five subslab sampling ports located at the daycare center were sealed with a resin/polymer that could not be removed with a utility knife. Therefore, these ports may not be usable for future sampling events.

V. TECHNICAL ASSESSMENT

QUESTION A: *Is the remedy functioning as intended by the decision documents?*

The ROD, as modified by the two ESDs, called for the excavation of the surface soils that were contaminated with VOCs, SVOCs, pesticides, and metals; excavation of the contents of the two dry wells and sump located outside the building and the dry well, sumps, and trench located inside the building; treatment of the VOC-contaminated unsaturated subsurface soils using ISVE; decontamination of the building floor through vacuuming and power washing; off-site disposal of the excavated material, vacuumed dust, and washwater; *in-situ* treatment of the contaminated

groundwater in the upper aquifer in the source area with an oxidizing agent, and ICs related to vapor intrusion.

The soil and groundwater remedies have been completed and the site has been deleted from the NPL.

While subslab soil gas samples at a number of locations under the former Jackson Steel building, daycare center and future exercise studio continue to exceed subslab EPA VISLs for PCE and TCE, such exceedances are only an indication that an indoor air problem may exist. The fact that all of the indoor air samples during the review period were significantly below the NYSDOH guideline and EPA's acceptable benchmarks indicates that the vapor intrusion mitigation systems are working effectively. In addition, the ICs that are in place are effective in preventing exposure.

QUESTION B: *Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of the remedy selection still valid?*

There have been no changes in the physical conditions of the site over the past five years that would change the protectiveness of the remedy. The human health risk assessment concluded that future commercial/industrial and residential exposure to building floor materials (via direct contact), surface soils (via inhalation of dusts/vapors) and groundwater (via ingestion, inhalation of vapors while showering, and direct contact) would result in risk and hazard exceeding EPA threshold criteria. The contaminants of concern (COCs) identified for the site include VOCs (namely, PCE and TCE), SVOCs (primarily, PAHs), pesticides, and metals. Land use assumptions, exposure assumptions and pathways, and clean up levels considered in the 2004 ROD and 2007 ESD followed the Risk Assessment Guidance for Superfund used by the Agency and remain valid. Although specific parameters may have changed since the time the risk assessment was completed, the process that was used is still valid.

The current and anticipated future use of this property (including soil and groundwater) is not expected to change in the next five years. Therefore, the RAOs noted in Section II, remain valid.

The ROD established the federal MCLs and NYSDEC Class GA groundwater standards as the cleanup criteria for the COCs in groundwater, which remain valid. The groundwater currently meets MCLs/NYSDEC Groundwater Criteria and the potential for any exposure through potable uses has been eliminated. The soil cleanup objectives were established pursuant to NYSDEC TAGM guidelines. Contaminated soil exceeding TAGM objectives in soil were excavated and no longer serve as a source of exposure. Although the TAGM objectives are no longer referenced, comparison of the cleanup goals established for the COCs with respective NYSDEC Soil Cleanup Objectives (6 NYCRR Part 375) and EPA Regional Screening Levels indicates that the remedy is considered to be protective of human health.

Changes in Toxicity Characteristics

The toxicity values for several COCs identified in soil and groundwater have changed since the ROD. During this time, toxicity values were updated to the Integrated Risk Information System (IRIS), EPA's consensus toxicity values, for TCE and PCE. These changes, however, are

considered in the vapor intrusion screening levels and would not impact the remedial decision or cleanup criteria chosen, for the site.

Vapor Intrusion

Vapor intrusion is currently considered to be the primary route of potential exposure at this site. The vapor intrusion pathway was evaluated by conducting indoor air and subslab sampling as described in Section IV. As discussed in the "Initial Response" section, vapor mitigation systems were initially installed in 2002 and replaced in 2016 to address vapor intrusion at the daycare center and former retail store/daycare center. The systems are periodically inspected and subslab and indoor air monitoring is ongoing.

EPA evaluated recent indoor air sample results in comparison to indoor air concentrations associated with a risk to a resident at concentrations of 10^{-6} (one in a million) and a noncancer HI of 1. The results of this comparison indicate that the indoor air concentrations for both PCE and TCE are within the risk range and below an HI of 1. All concentrations fell below the current NYSDOH ambient air guideline values as well. Although subslab concentrations have increased due to ISVE decommissioning, indoor air concentrations beneath the EPA and NYSDOH benchmarks indicate the remedy continues to be effective at mitigating exposure. In addition, ICs requiring vapor intrusion investigation and/or mitigative measures were instituted for the former Jackson Steel building should it be occupied, or replaced with another structure, in the future.

Ecological Risk

Although the ecological risk assessment screening values used to support the ROD may not necessarily reflect the current values, the exposure assumptions remain appropriate and, thus, the remedy remains protective of ecological resources. The terrestrial exposure pathway has been addressed by the removal of contaminated surface soil. Although the contamination in the Upper Glacial Aquifer has also been addressed, it never posed an ecological risk since this aquifer does not discharge into any water bodies in the vicinity of the site.

QUESTION C: *Has any other information come to light that could call into question the protectiveness of the remedy?*

No information has come to light that would call into question the protectiveness of the remedy.

VI. ISSUES/RECOMMENDATIONS

Table 4: Issues/Recommendations

Issues/Recommendations
OU(s) without Issues/Recommendations Identified in the Five-Year Review:
OU1

Although no issues/recommendations were identified that impact current or future protectiveness, some findings were noted specific to routine operation and maintenance. Specifically, the five subslab sampling ports located at the daycare center that were sealed need to be opened or replaced before the next sampling event.

Since the removal of the ISVE system, PCE and TCE concentrations in the Jackson Steel, daycare center, and former retail store/daycare center building subslabs have increased, suggesting that residual contamination remains beneath the slab of the former Jackson Steel building. The increasing VOC trend in the subslab needs to be evaluated as monitoring continues. The daycare center and former retail store/daycare center indoor air results continue to be below NYSDOH guidelines and EPA VISLs, indicating the effectiveness of the subslab mitigation systems. Future actions will be evaluated, if warranted.

VII. PROTECTIVENESS STATEMENT

Table 5: Protectiveness Statements

Protectiveness Statement(s)	
Operable Unit: OU 1	*Protectiveness Determination:* Protective
Protectiveness Statement: The remedy at OU 1 is protective of human health and the environment.	
Sitewide Protectiveness Statement	
Protectiveness Determination: Protective	
Protectiveness Statement: The sitewide remedy is protective of human health and the environment.	

VIII. NEXT REVIEW

The next FYR report for the Jackson steel Superfund site is required five years from the completion date of this review.

Figure

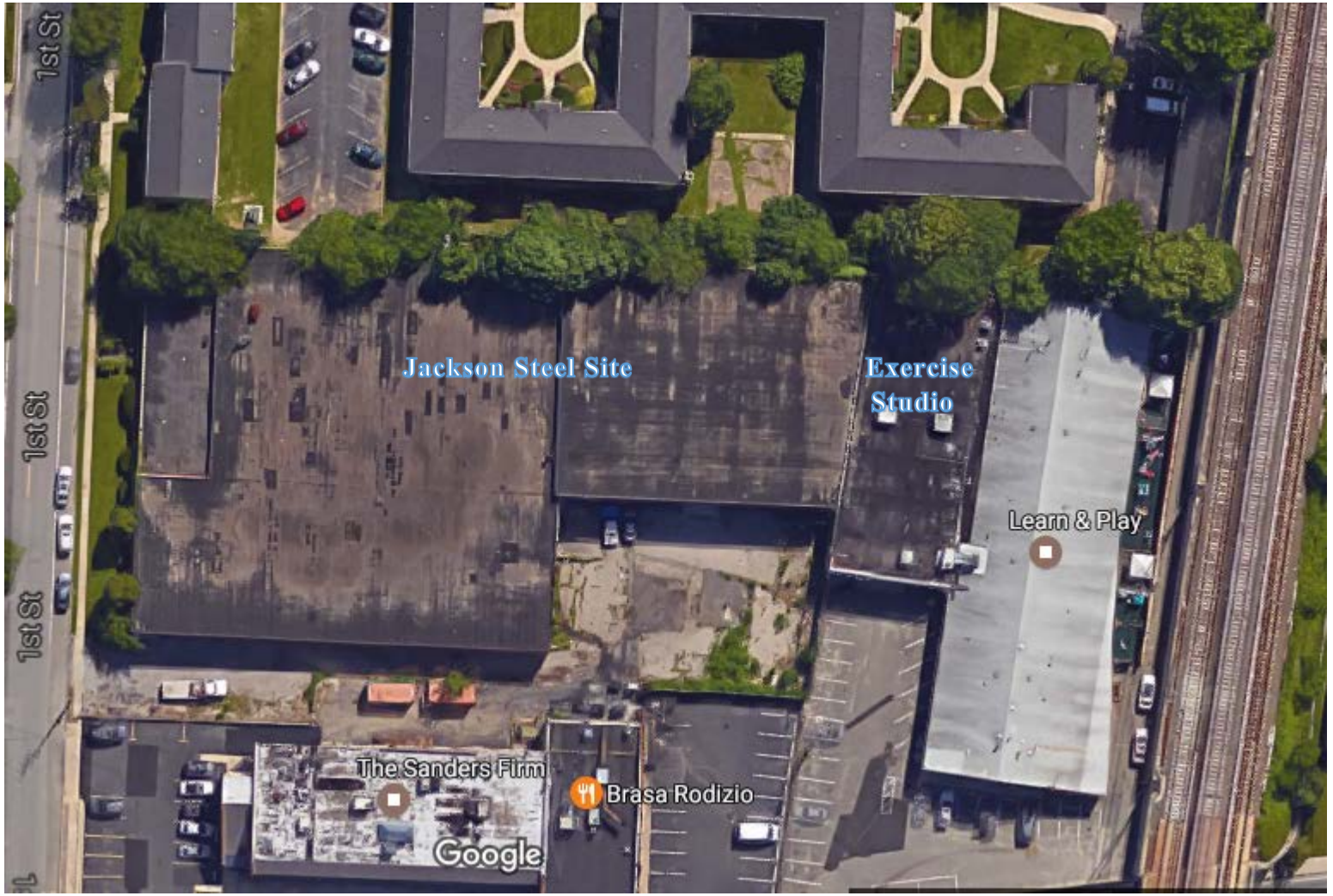

Figure 1—Jackson Steel Site

APPENDIX A – REFERENCE LIST

Documents, Data, and Information Reviewed in Completing Five-Year Review	
Document Title (Author)	**Submittal Date**
Record of Decision, Jackson Steel Superfund Site, Mineola, Nassau County, New York, Environmental Protection Agency	September 2004
Remedial Action Construction Report Upper Glacial Aquifer for the Jackson Steel Site, Mineola, New York, CH2MHill	September 2006
Preliminary Close-Out Report, Environmental Protection Agency	August 2007
Explanation of Significant Differences, Jackson Steel Superfund Site, Mineola, Nassau County, New York, Environmental Protection Agency	August 2007
Remedial Action Report for Soils and Building Floor Decontamination for the Jackson Steel Superfund Site, Mineola, New York, CH2MHill	September 2008
Summary of 2013 and 2014 Analytical Results for Indoor Air Samples, Jackson Steel Superfund Site, Mineola, New York, CH2MHill	2014
Summary of 2015 Analytical Results for Indoor Air Samples, Jackson Steel Superfund Site, Mineola, New York, Environmental Protection Agency	July 2015
Summary of 2016 Analytical Results for Indoor Air Samples, Jackson Steel Superfund Site, Mineola, New York, Environmental Protection Agency	2016
Explanation of Significant Differences, Jackson Steel Superfund Site, Mineola, Nassau County, New York, Environmental Protection Agency	June 2016
Report of Vapor Mitigation System Installation, Operations, and Maintenance, Learn & Play Day Care Center, 80 Herricks Road, Mineola, New York, Alpine Environmental Services	June 2016
Jackson Steel Superfund Site Vapor Intrusion Management Plan, Environmental Protection Agency	June 2016
Jackson Steel Superfund Site Institutional Control Implementation and Assurance Plan	June 2016
Jackson Steel Close-Out Report, Environmental Protection Agency	July 2016
National Oil and Hazardous Substances Pollution Contingency Plan; National Priorities List: Deletion of the Jackson Steel Superfund Site, Proposed rule; notice of intent for deletion, Environmental Protection Agency	August 2016
National Oil and Hazardous Substances Pollution Contingency Plan; National Priorities List: Deletion of the Jackson Steel Superfund Site, Proposed rule; Direct final rule, Environmental Protection Agency	August 2016
EPA guidance for conducting five-year reviews and other guidance and regulations to determine if any new Applicable or Relevant and Appropriate Requirements relating to the protectiveness of the remedy have been developed since EPA issued the Record of Decision	

APPENDIX B – TOPOGRAPHY, SITE GEOLOGY/HYDROGEOLOGY, AND LAND AND RESOURCE USE

Topography

The local topography surrounding the site consists of relatively flat terrain, with gentle changes in elevation that typically do not exceed twenty feet of vertical relief. The site itself is flat with no discernible change in topography, and has an elevation of 96-98 feet above mean sea level.

Site Geology/Hydrogeology

Surface soils at the site are Upper Pleistocene Deposits, which are commonly referred to by the name of the hydrogeologic unit that they form, the Upper Glacial Aquifer. This Upper Glacial unit consists, predominantly, of varying consistencies of intermixed-to-interbedded, brown-orange-yellow sands and gravels to a depth of approximately 105 feet below ground surface (bgs). Some silts were observed, mainly near the ground surface, but also in smaller quantities deeper in the formation and in minor lenses throughout. Little or no clay was observed.

At approximately 105 feet bgs, the top of the Magothy Formation is encountered. The top of the formation (the Magothy Confining Bed) consists of characteristic fine-to-medium sands interbedded with clay and sandy-silty clay, with gray coloration, and the presence of organic lignite (wood) fragments. The Magothy Confining Bed appears to be a localized occurrence overlying the Magothy Aquifer in the vicinity of the site. Its observed thickness at the site was approximately 296 feet. This thickness decreases significantly over a relatively short lateral distance to the northeast (approximately 600 feet) to 42 feet thick. Its thickness decreases to approximately 167 feet approximately 600 feet southwest of the site.

The silty clay of the Magothy Confining Bed is believed to be a semi-confining layer effectively separating the Upper Glacial Aquifer and the Magothy Formation.

The groundwater flow in the Upper Glacial and Magothy Aquifers in this vicinity is to the southwest under non-stressed conditions. Pumping of the public supply and irrigation wells influences the groundwater flow direction.

Land and Resource Use

The property, which has been used for industrial/commercial purposes since it was constructed, has been zoned for a number of different uses through the past several decades. The property is presently zoned “B-1” for business use as retail or office space.

Area residents utilize municipal water.

APPENDIX C – SUMMARY OF RESULTS OF SUPPLEMENTAL INVESTIGATIONS

Record of Decision

The 2004 Record of Decision included measures to address the deep aquifer as follows:

- extraction and treatment of the contaminated groundwater in the deep aquifer if confirmatory groundwater sampling indicates that the site is a principal source of the groundwater contamination to the aquifer underlying the site;
- if it is determined that the site is a principal source of the groundwater contamination to the deep aquifer underlying the site, the selected remedy would be expanded, as necessary, to include off-property groundwater contamination; and
- long-term groundwater monitoring.

Supplemental Investigations

A supplemental groundwater investigation was conducted from 2005 to 2006 to determine the source of the Magothy Aquifer contamination underneath the site and to establish whether there was a relationship between the contamination at the site and the VOC contamination detected in nearby Village of Mineola Supply Well #4. Based on the results of the investigation, it was concluded that the Site was not a current source of contamination in the Magothy Aquifer. Therefore, EPA decided not to implement the Magothy Aquifer groundwater remedy. An Explanation of Significant Differences (ESD) was issued in 2007, documenting this decision.

Because soil gas samples collected from below the concrete slab of the former Jackson Steel building continued to contain elevated concentrations of PCE and TCE, in January/February 2012, a Membrane Interface Probe (MIP)[5] investigation was performed to delineate the lateral and vertical extent of PCE and TCE in the soils as a potential source of soil gas concentrations. Soil confirmation samples were collected to assist in the evaluation of the MIP results by associating MIP field data with soil sample results. Probing was initially conducted on a grid system with approximately 30-foot spacing and were terminated at 50 feet bgs. Subsequently, probe locations and terminal depth were adjusted in accordance with real time results. A limited soil boring program was implemented in conjunction with the MIP investigation to visually inspect and log soil cores and ground truth the observed MIP sensor responses against field observations.

[5] The MIP fits onto conventional GeoProbe direct-push technology (DPT) drilling equipment and is inserted into the target investigation zone in a manner similar to a standard DPT sampling device. The MIP tool contains a membrane in the tip that is permeable to VOCs and a built-in heating element that heats the soils and groundwater adjacent to the probe, causing VOCs near the MIP to volatilize and the vapors diffuse across the membrane, where an inert carrier gas transports the VOCs through sealed tubing to the data acquisition vehicle containing a Photoionization Detector, a Flame Ionization Detector, and an Electron Capture Detector. The detectors do not provide a quantitative concentration of VOCs in the soil, nor do they differentiate between compounds (*e.g.*, identify PCE or TCE). However, the response level from the detector corresponds to the amount of VOCs present in the carrier gas, which is proportional to the amount of VOCs in the soil or groundwater at the MIP location. A greater response from the detector indicates greater VOC concentrations in the subsurface. Since MIP analytical detection systems do not provide fully quantitative results, accuracy is assessed qualitatively by measuring the agreement between detect and non-detect determinations made by the MIP and by corresponding confirmatory laboratory samples.

In general, the comparison of soil boring log observations, soil analytical results and MIP logs showed a general concurrence. The soil sample's analytical results showed PCE ranging in concentration from 0.0051 to 14 milligrams per kilogram (mg/kg) (the TAGM is 1.4 mg/kg) in soils just beneath the floor of the building and TCE concentrations ranging from not detected to 0.016 mg/kg (the TAGM is 0.7 mg/kg).

The MIP technology identified three potential shallow subsurface (2- 6 feet below grade) hot-spots where confirmatory soil samples were collected using conventional drilling and soil sampling methods. Based on the results of the MIP investigation and confirmatory soil samples, enhancements were made to the ISVE system. Specifically, nine new extraction wells were installed in the three discrete hot-spot areas inside the building in early June 2012.

APPENDIX D – INSTITUTIONAL CONTROLS

Institutional Controls

On June 20, 2016, EPA sent a letter to the Village of Mineola Superintendent of Buildings, requesting that EPA and New York State Department of Environmental Conservation (NYSDEC) be notified if the existing building is to be refurbished and used for human occupancy or demolished and a new structure constructed and requested that the Village not issue a Certificate of Occupancy until necessary vapor intrusion-related actions identified by EPA and NYSDEC are carried out. Periodic reminders will be issued to the Village to help ensure the effectiveness of this measure.

On July 27, 2016, notices were placed on the deed of the two parcels occupied by the daycare center (and future exercise studio) and the parcel occupied by the former Jackson Steel building. The notice on the deed of the daycare center and future exercise studio requires that the subslab vapor intrusion mitigation systems be operated as long as elevated levels of vapors remain under the buildings on the property and the buildings are occupied. The notice on the deed of the former Jackson Steel building alerts any potential purchaser, lessee, or other user of the property that EPA and NYSDEC must be notified if and when a determination is made that the existing building will be refurbished and used for human occupancy or demolished and a new structure constructed. EPA intends to effect an environmental easement on the Jackson Steel property in the future once a new owner takes control of the property.