FIRST FIVE-YEAR REVIEW REPORT
LAWRENCE AVIATION INDUSTRIES SUPERFUND SITE
PORT JEFFERSON STATION, NY STATE

Prepared by
U.S. Environmental Protection Agency
Region 2
New York, New York

Approved by:

Walter E. Mugdan, Director
Emergency and Remedial Response Division

Date:

July 20, 2015

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Executive Summary

This is the first five-year review for the Lawrence Aviation Industries (LAI) Superfund site (Site) located in Port Jefferson Station, Suffolk County, New York. The purpose of this five-year review is to review information to determine if the remedy is and will continue to be protective of human health and the environment. The triggering action for this statutory five-year review is the soil remedy construction start date.

The remedy for LAI Site is protective of human health and the environment in the short term. However, in order for the remedy to be protective in the long term, a declaration of covenants, restrictions, and environmental easements need to be filed for the LAI industrial area of the Site.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site Name: Lawrence Aviation Industries, Inc. Site		
EPA ID: NYD002041531		
Region: 2	**State:** NY	**City/County:** Port Jefferson Station/Suffolk

SITE STATUS	
NPL Status: Final	
Multiple OUs? No	**Has the site achieved construction completion?** Yes

REVIEW STATUS
Lead agency: EPA
Author name (Federal or State Project Manager): Maria Jon
Author affiliation: EPA
Review period 1/19/2009 thru 6/1/2015
Date of site inspection: 9/9/2014
Type of review: Statutory
Review number: 1
Triggering action date: 1/19/2009
Due date *(five years after triggering action date)*: 1/19/2014

OU(s): LAI former industrial area	Issue Category: Institutional Controls			
	Issue: .The declaration of covenants, restrictions, and environmental easements contemplated by the Decision Document for the LAI former industrial area has not been implemented.			
	Recommendation: The declaration of covenants, restrictions, and environmental easements should be in place.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	Other	EPA	12/30/2020

Protectiveness Statement(s)	
Operable Unit: LAI industrial area	*Protectiveness Determination:* Short-term Protective

Sitewide Protectiveness Statement

Protectiveness Determination:
The remedy for LAI Site is protective of human health and the environment in the short term. However, in order for the remedy to be protective in the long term, a declaration of covenant, restrictions, and environmental easements need to be filed for the LAI manufacturing property that will limit the use of the industrial area to commercial and/or industrial uses only.

Introduction

The purpose of a five-year review 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 and is functioning as intended by the decision documents. The methods, findings, and conclusions of reviews are documented in the five-year review. In addition, five-year review reports identify issues found during the review, if any, and document recommendations to address them.

This is the first five-year review for the Lawrence Aviation Industries (LAI) site (Site), located in Port Jefferson Station, Suffolk County, New York. This five-year review was conducted by the Environmental Protection Agency (EPA) Remedial Project Manager (RPM) Maria Jon. The review was conducted pursuant to Section 121(c) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended, 42 U.S.C. §9601 *et seq.* and 40 CFR 300.430(f)(4)(ii), and in accordance with the *Comprehensive Five-Year Review Guidance*, OSWER Directive 9355.7-03B-P (June 2001). This report will become part of the Site file.

The triggering action for this statutory review is the January 19, 2009, start date of the soil remedial action. A five-year review is required at this Site due to the fact that hazardous substances, pollutants or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure. The Site consists of one operable unit, which is addressed in this five-year review.

Site Chronology

See Table 1 for the site chronology.

Background

Physical Characteristics

The LAI industrial facility property, which is part of the Site, is located at 100 Sheep Pasture Road, Port Jefferson Station, Suffolk County, New York (refer to Figure 1: Facility Property Location Map). Approximately 42 acres in size, the LAI industrial facility was used historically to produce titanium sheeting for the aeronautics industry. The LAI industrial facility presently consists of 10 dilapidated former production and manufacturing buildings that occupy over 200,000 square feet of space. These buildings are located in the southwestern portion of the property. A former drum-crushing area is located south of the buildings. Approximately 80 acres of the Site located to the northeast and east of the LAI industrial facility are referred to as the "Outlying Parcels" consisting of vacant, wooded areas. Finally, the Site also consists of a downgradient contaminated groundwater plume in a primarily residential area, located to the north of the LAI industrial facility.

Port Jefferson High School is within a one-mile radius of the Site. Topographically, the LAI properties (both the industrial facility and the Outlying Parcels) are located at approximately 225 feet above sea level. The Long Island Railroad and Sheep Pasture Road form the northern

boundary of the LAI industrial facility property; to the east and the west are residential single-family homes; and to the south are a New York State Department of Transportation right-of-way (NYSDOT ROW) and the Long Island Power Authority ROW (LIPA ROW). The Village of Port Jefferson, the Port Jefferson Harbor, which is an inlet of Long Island Sound, and a ferry terminal are located one mile to the north.

Site Geology/Hydrogeology

Site Geology

Three aquifers are present beneath the LAI Site: the Upper Glacial Aquifer, the Magothy Aquifer, and the Lloyd sand member of the Raritan Formation. The Magothy and underlying Lloyd Sand Aquifers are separated by the Raritan Clay member of the Raritan Formation. Consequently, water is interchanged much more readily between the Upper Glacial and Magothy Aquifers than between the Magothy and Lloyd Aquifers. The presence of the virtually impermeable Raritan Clay, directly underlying the Magothy Aquifer, is the lower boundary of the upper flow system. Investigations at the Site have only focused on the Upper Glacial Aquifer and the top of the Magothy Aquifer.

The top of the Magothy Aquifer, which underlies the Upper Glacial Aquifer, was observed at a depth of 324 feet below ground surface (bgs) (99 feet below mean sea level [msl]) in stratigraphic boring ST-03. This unit was also observed in the boring for MPW-09 at a depth of 108 feet bgs (98 feet below msl). The Magothy Aquifer consists of Upper Cretaceous Magothy deposits to the top of the confining clay unit of the Raritan Formation. The aquifer has a fluvial-deltaic depositional origin, is wedge shaped, and thickens progressively towards the south and southeast. The Magothy deposits were unconformably overlain by a veneer of Pliocene and Pleistocene deposits, chiefly of glacial origin. Deposition of the glacial deposits left the top of the Magothy Aquifer irregular and marked by discontinuous clay bodies within the deposits of the Pliocene Pleistocene succession (Upper Glacial Aquifer), Smithtown Clay Unit, or Magothy Formation. This upper portion of the Magothy will be referred to as the reworked Magothy.

The LAI industrial facility itself is directly underlain by the Pleistocene-age "Harbor Hill moraine," a remnant of the most recent glaciation. The moraine is up to 70 feet thick and composed primarily of sand and gravel with occasional lenses of silty sand and silt. The moraine deposits thin to the south and to the north.

At the LAI industrial facility, the moraine deposits are underlain by well-graded fine to medium grained sands and silts with occasional layers of silt and clay or sand and gravel. The clay rich layers observed in this zone were thin and discontinuous, likely derived from Magothy formation materials (or Smithtown Clays) reworked and then re-deposited during the creation of the local moraine. This localized glacial activity at the Site has reworked the upper layers of the Magothy Formation and left very complex heterogeneous glacial deposits at the base of the Upper Glacial Aquifer, this material is not differentiated from the reworked Magothy material described above.

Hydrogeology

Generally, the Upper Glacial Aquifer is under unconfined conditions and the upper limit is the water table. Synoptic groundwater elevation data collected during the remedial investigation (RI) and recently in June 2014 were used to prepare a potentiometric surface map for the Upper Glacial Aquifer at the LAI Site and downgradient of the Site to the Village of Port Jefferson. In order to interpret vertical and horizontal flow potential, the water level elevation data was contoured in cross section and then projected to plan view.

The groundwater flow, in the vicinity of the LAI industrial facility, is to the north towards Port Jefferson Harbor. The depth to the water table is approximately 190 feet bgs (at the Site) and decreases to the north, towards Port Jefferson Harbor. As expected there is a downward gradient observed under the moraine, but moving to the north and off of the moraine towards Port Jefferson Harbor, there is a significant upward hydraulic gradient driving groundwater towards the ground surface (at MPW-09 the Upper Glacial Aquifer is under artesian conditions). These observations are consistent with previous studies.

Land and Resource Use

The LAI industrial facility property and its surrounding area are zoned industrial and residential. The closest residence to the Site is located approximately 1,000 feet north of the LAI industrial facility. The areas to the north, northwest, and west of the LAI industrial facility are zoned residential and contain single family houses, a vacant wooded area, and an apartment complex. The areas to the northeast and east are zoned for industrial use but are currently vacant. Immediately west of the LAI industrial facility is a mulch manufacturing operation, "Chip-it-All." The NYSDOT ROW, which is being utilized as a nature trail/bike route, also passes through the LAI properties from east to west, running along the southern part of the LAI properties. Currently, the LAI industrial facility is not operating and the dilapidated buildings are vacant and unused, but LAI and its president are still the owners of the LAI industrial facility property and the Outlying Parcels. In December 2014, the Town Board of the Town of Brookhaven issued a proposed Lawrence Aviation Industries Land Use Plan. The land use plan calls for eliminating residential zoning on the LAI properties and replacing it with light industrial uses such as factories, offices and storage facilities. The plan also calls for developing green energy projects such as solar panel farms.

Public water supply wells of the Suffolk County Water Authority (SCWA) are located approximately one mile northeast of the LAI industrial facility.

History of Contamination

The LAI industrial facility was previously part of a turkey farm owned by LAI's corporate predecessor, Ledkote Products Co., of New York (Ledkote). Established in Port Jefferson Station in 1951, Ledkote produced items including lead gutters and downspouts for roof drains. Since 1959, the 42-acre LAI industrial facility has manufactured products from titanium sheet metal, including golf clubs and products for the aeronautics industry, under the LAI name.

In 1980, LAI crushed more than 1,600 drums, allowing the liquid contents to spill on unprotected soil. The drums contained TCE, PCE, spent acid sump sludges, salt wastes, hydraulic oils, hydrofluoric acid, nitric acids, and other plant wastes. Adjacent residential wells were found to be contaminated with fluoride, nitrates, TCE, 1,1-dichloroethylene, *cis*-1,2-dichloroethene (*cis*-1,2-DCE), PCE, and heavy metals. The NYSDEC discovered more than 2,000 drums stored on the Site. Drum contents included waste solvents, acetone, acids, oils, salty bases, inks, and untreated acidic sludges, as well as numerous types of solid waste.

Past disposal practices have resulted in a variety of contaminant releases including trichloroethene (TCE), tetrachloroethene (PCE), acid wastes, oils, sludge, metals, and other industrial plant wastes. Previous investigations in the vicinity of the Site suggest that releases of hazardous substances from the facility have affected Site soils and groundwater, surface water, and sediments downgradient of the Site. Adjacent residential wells were found to be contaminated with fluoride, nitrates, TCE, 1,1-dichloroethene, and PCE.

Initial Response

In 1987, as part of a removal action, the EPA provided bottled water to homes with private wells affected by contaminated groundwater and subsequently connected those homes to the public water supply. In 1991, the New York State Department of Environmental Conservation (NYSDEC), Region 1 Resource Conservation and Recovery Act (RCRA) Hazardous Substance Group oversaw a major drum removal action at the Site. In the 1990s, the SCWA, under contract with the NYSDEC, connected additional homes affected by groundwater contamination attributed to LAI to public water supplies. In 1997, NYSDEC conducted a limited remedial investigation (RI); the results from this limited RI revealed that groundwater and surface water were affected by elevated concentrations of chlorinated volatile organic compounds (CVOCs).

Based on the above investigations, in 1999 NYSDEC requested that EPA place the Site on the National Priorities List (NPL). EPA prepared a hazard ranking system (HRS) report and proposed the Site for inclusion on the NPL on October 22, 1999. The Site was listed on the NPL on March 6, 2000. In March and April, 2004, EPA conducted a removal action. EPA unstacked and restaged approximately 1,300 drums, containers, and cylinders containing various flammable solids, acids, bases, gas cylinders and unknown compounds, and inventoried the laboratory area, identifying at least 390 containers. Most of the drums and containers were disposed of off-site in October and November 2004. In March 2005, a 13.5-ton shipment of transformers and capacitors filled with suspected polychlorinated biphenyl (PCB) liquids was removed from the Site and disposed of as part of the removal action.

Basis for Taking Action

EPA conducted a remedial investigation/feasibility study (RI/FS) of the Site for soil and groundwater from August 2003 to May 2005. The RI documented a volatile organic compound (VOC) plume originating at the LAI industrial facility and also identified PCB-contaminated soil on the LAI industrial facility property. The highest TCE groundwater concentrations were detected on the LAI facility at monitoring well MPW-07, at a depth of approximately 200 to 210 feet bgs, with concentrations of approximately 1,100 micrograms per liter (µg/L).

The results of the Risk Characterization conducted indicated an unacceptable cancer risk from exposure to groundwater through ingestion, inhalation, and dermal contact from groundwater at the Site. Results also indicated an unacceptable non-cancer hazard from exposure to groundwater through ingestion, inhalation, and dermal contact from contaminated groundwater, as well as an unacceptable non-cancer hazard from exposure to surface soil at the LAI Facility. A screening-level ecological risk assessment evaluation determined that surface water in Old Mill Creek and Old Mill Pond had the potential to cause ecological adverse health effects due to cis-1,2-DCE and, at the LAI Facility, soils due to PCBs.

Remedial Actions

Remedy Selection

A Record of Decision (ROD) for the Lawrence Aviation Industries Site was issued in September 2006, and addressed contamination in soil, groundwater, surface water, and sediments. Each media is discussed separately below:

Soil and Sediment Remedy

The remedial action objectives (RAOs) for soil are to:

- Prevent or minimize human exposure with soils having PCB contaminant concentrations in excess of soil cleanup objectives; and
- Manage ecological risks

The RAOs for LAI catch basin sediments are to:

- Prevent or minimize the potential release of contamination in catch basin sediments to soil and/or groundwater; and
- Prevent current and future ecological and human exposures to contaminated sediment.

There were no RAOs selected for sediments outside of the catch basin (i.e., downgradient of Old Mill Pond, Old Mill Creek and Port Jefferson Harbor). Because of the low bioaccumulation potential and low bioavailability, the potential risks to ecological receptors from exposures to the VOCs detected in sediments are low. After remediation of groundwater, Site-related VOC contamination will not persist in the surface water sediment; therefore, no remedial action was required for these surface water sediments.

The major components of the remedy that address contaminated soils and catch basin sediments are:

- Pre-design investigation;
- Excavation of surface soils at the on-site LAI facility exhibiting PCB concentrations exceeding the remediation goal of 1 part per million (ppm);
- Post-excavation sampling to verify achievement of soil cleanup objectives;
- Disposal of excavated soils at off-site facilities;
- Backfilling of excavated areas with clean fill;

- Institutional controls consisting of an environmental easement/restrictive covenant filed in the property records of Suffolk County that will limit the use of the active industrial area to commercial and/or industrial uses only;
  Evaluation of additional catch basins and removal of sediments; and
- Evaluation of approximately 30 electrical transformers for leakage of PCB contents and implementation of remedial actions to address these transformers if cleanup objectives are exceeded.

Groundwater Remedy and Surface Water Remedy

The RAOs for groundwater are to:

- Prevent or minimize potential, current, and future human exposures including inhalation, ingestion and dermal contact with VOC-contaminated groundwater;
- Minimize the potential for off-site migration of VOC-contaminated groundwater;
- Restore groundwater to levels which meet New York State Groundwater and Drinking Water Quality Standards within a reasonable time frame; and
- Prevent or minimize VOC-contaminated groundwater from discharging into Port Jefferson Harbor.

The RAOs for surface water are to:

- Prevent or minimize potential human exposure including ingestion, inhalation and dermal contact with VOC-contaminated surface water;
- Restore surface water to levels which meet Surface Water Quality Standards within a reasonable time frame; and
- Prevent or minimize VOC-contaminated surface water that exceeds water quality standards from discharging into Port Jefferson Harbor.

The major components of the remedy that address contaminated groundwater are:

- Installation of groundwater extraction and treatment systems both at the LAI facility and within the plume area near Old Mill Pond;
- *In-situ* chemical oxidation (ISCO) applied as an initial enhancement within the area of high TCE concentrations in groundwater at the LAI facility;
- Imposition of institutional controls;
- Development of a Site Management Plan;
- Long-term groundwater and surface water monitoring to provide an understanding of changes in contaminant concentrations and distribution over time; and
- Conduct an investigation of vapor intrusion into structures within the area that could be potentially affected by the groundwater contamination plume, and implementation of an appropriate remedy (such as subslab ventilation systems) based on the investigation results. Any new or renovated building or on-site structure that will be occupied in the future should be evaluated for soil vapor intrusion.

Surface water in Old Mill Pond and Old Mill Creek has been contaminated with VOCs, including TCE, PCE and *cis*-1,2-DCE, via contaminated groundwater discharging to surface water bodies. It is expected that by remediating the groundwater source of contamination, the contamination levels in the surface water and sediments will also be reduced and eliminated. As a result, no remedial actions were selected to directly address contaminated surface water.

Remedy Implementation

Remedial Action (RA) Activities for Soil, Sediment, Transformers and Drainage Structures

In November 2008, the Removal Support Team 2 (RST 2) was tasked to provide remedial support including additional sampling to further delineate the extent of surface/subsurface PCB contamination in soil; the inventory and multi-media sampling of all accessible drainage structures; sumps located on-site; soil sampling of three previously excavated areas in the vicinity of former underground storage tanks or fuel spills; soil sampling adjacent to a transformer area; and inventory of electrical transformers and sampling of transformer dielectric fluid for PCB content. Soil samples were also collected from a borrow pit located on the Site for possible consideration as backfill material. These samples were analyzed for metals, VOCs, SVOCs, pesticides, PCBs, herbicides, RCRA Characteristics, and total petroleum hydrocarbons-diesel range organics (TPH-DRO).

Transformers and Drainage Structures Remedial Activities

EPA identified 30 transformers that had not previously been evaluated. These transformers were inventoried and mapped as part of the assessment. The transformers appeared to be old, but no evidence of ongoing leakage was visible either on the transformers or on the ground beneath them. Three transformers that had been taken out of service were found in steel containment pans stored in Building F. These three transformers were leaking dielectric fluid. The EPA sampled the dielectric fluid from all of the transformers for PCB analysis. Seven of the 30 samples were reported as containing PCBs above 50 ppm, including the leaking transformers in the steel containment pans. On April 28, 2014, the EPA removed the remaining fluid from the three leaking transformers as well as the steel containment bins. The empty PCB contaminated transformers, and bins were shipped off Site to a recycling facility for decontamination and recycling. Once removed from the Storage Building, minor oil stains in the vicinity of transformers were scoured out of the concrete until no longer visible. The concrete debris generated was containerized for disposal. The drums of PCB-contaminated fluids and debris generated from the operation were also shipped off Site for disposal. By evaluating all of the transformers present and disposing of three leaking PCB contaminated transformers, the goals established in the ROD for transformers were met.

Twenty-eight non-leaking transformers remain present at the LAI facility, 14 of which contain dielectric fluid with PCB concentrations ranging from 1.9 ppm to 160 ppm. Should a release of the PCB contaminated fluids less than 50 ppm occur in the future, evaluation of any impacted area would be appropriate to determine the resulting concentration of PCBs in spill-impacted media. In accordance with TSCA requirements, any spill originating from a transformer containing PCBs in excess of 50 ppm, would require a cleanup regardless of the resulting concentration in spill impacted media.

Drum Crushing Area Soil Remedial Activities

The Drum Crushing Area (DCA) is approximately three acres cleared of land located on the southwestern part of the property. The DCA was reportedly used as an area to crush drums prior to disposal.

The NYSDOT ROW exists within the DCA. Approximately 75 feet wide, the NYSDOT ROW extends 600 feet from the east corner to the west corner of the DCA. In addition, soil contamination extended beyond the DCA and the southwestern property boundary onto the LIPA ROW. Delineation and remedial activities within the NYSDOT ROW and the LIPA ROW were part of the overall activities conducted within the DCA. The remediation of the PCB-contaminated soil in the former DCA, NYSDOT ROW and the LIPA ROW occurred between January 2009 and September 2009. Soil was excavated to a depth where a PCB concentration of 1 ppm or less was encountered.

Recharge Basin Remedial Activities

The area known as the Recharge Basin is located on the southwestern corner of the LAI industrial facility. Sample locations where PCBs exceeded 1 ppm were excavated and disposed off-site properly. Soil remediation in the Recharge Basin mostly consisted of removing approximately 12 inches of soil from the existing disturbed terrain, therefore this area was backfilled only as needed to establish a consistent gradient throughout due to the lesser amount of soil that was removed.

Areas of Concern Investigated and Remediated

Additional areas of soil contamination were identified that required remediation. These areas at the LAI property were the location of previous excavations that were conducted for the removal of underground storage tanks or the removal of contaminated soil resulting from PCB contaminated oil spills. These discreet locations were designated as areas of concern and are identified in Figure 5. For additional information, refer to an EPA report dated September 2014, "Remedial Action Report, Lawrence Aviation Industries Superfund Site", Port Jefferson Station, NY."

Soil Restoration activities

All areas remediated were excavated to a minimum total depth of 12 inches and were covered with geo-textile fabric before being backfilled with clean fill. This served as a visual indicator of the extent of the excavation and separated the excavation base from the backfill. The backfill material was obtained from a borrow pit located at the northern part of the LAI property and away from the area of former industrial operations. Prior to utilization, the material from the borrow pit was sampled and analyzed to ensure it was free of contaminants.

All areas remediated in the DCA, the NYSDOT ROW and the LIPA ROW were backfilled and graded approximately to the previous grade. The LIPA ROW was not backfilled since only a small volume of soil was removed. In order to limit the duration of work in the ROW, LIPA requested that the sidewall be tapered leaving only a small depression. The excavation base in the DOT ROW was lined with geotextile fabric prior to backfilling. Grade stakes were placed to

ensure a minimum of one foot of clean soil cover was in place over the geotextile fabric. Final restoration included seeding and mulching of all disturbed areas.

Approximately 17,000 tons of soil were excavated and shipped off-site for disposal.

Remedial Construction Activities for the LAI Facility Groundwater Remedy and the Old Mill Pond Groundwater Remedy

LAI Facility Groundwater Remedy

EPA funded construction of the LAI facility groundwater remedy for the source area in May 2009. The work was completed by CDM Federal Programs Corporation (CDM), EPA's Contractor. Project planning and RA construction activities were implemented from May 2009 through March 2011, and the RA construction subcontract was awarded to Arrowhead Contracting, Inc., in October 2009.

The RA final construction scope of work included the following:

- Construction of ISCO injection and monitoring wells at the LAI facility in support of the potassium permanganate ISCO groundwater remedial action performed before the groundwater treatment system startup

- Construction of a groundwater extraction, treatment, and injection system at the LAI industrial facility to achieve hydraulic control and to remove contaminant mass from the saturated-zone VOC-contamination source area.

- The scope was expanded during and after construction to remove and dispose off-site lead-contaminated soils that were uncovered in the vicinity of groundwater treatment system components during construction.

The ISCO application included the installation of 13 injection and five monitoring wells, and required the injection of a 1.5 percent potassium permanganate solution. The groundwater treatment system included the following components: two groundwater extraction wells; an air stripper; transfer pumping system; bag filters; an off-gas treatment system (activated carbon adsorption); and five injection wells. A total of 354,000 gallons of the 1.5 percent solution was initially injected in July 2010 and a second treatment of 252,500 gallons of 1.5 percent solution was injected in August 2010. ISCO monitoring wells were monitored during injections to evaluate water level increases, changes in geochemical conditions and field parameters to determine influence during injections.

The groundwater treatment facility (GWTF) at the LAI facility was completed on September 20, 2010. See Figure 3. Hydraulic plume control of the source area is achieved by extracting contaminated groundwater via two extraction wells (EW-01 and EW-02). Extracted groundwater is treated by an air stripper and discharged to groundwater via five upgradient injection wells (IW-01 through IW-05) under a NYSDEC State Pollutant Discharge Elimination System (SPDES) permit equivalent. The VOC-rich air exiting the air stripper is treated by two vapor phase granular activated carbon (GAC) units before discharging to the air under a NYSDEC air permit equivalent.

Old Mill Pond Groundwater Remedy

The following section focuses on the remedy that addresses the downgradient contaminated groundwater that has migrated beyond the Lawrence Aviation Industries property boundary, in Port Jefferson, New York. In the fall of 2009, EPA authorized the allocation of funding to build a second GWTF near Old Mill Pond. The system would capture and treat the contaminated groundwater emanating from the upgradient LAI property, as well as prevent contaminated water from discharging into the Old Mill Pond, Old Mill Creek, and Port Jefferson Harbor.

In 2010, EPA initiated and completed a number of projects throughout Port Jefferson in support of this portion of the groundwater remedy. Portions of the Old Mill Pond and Old Mill Creek were cleaned and dredged. Household trash, dead vegetation, and other debris were removed from the surface water and creek embankment. Discharge piping was placed along Caroline Avenue and Barnum Avenue to carry treated discharge water to Old Mill Creek.

In April 2010, access agreements were signed by the Mayor of Port Jefferson authorizing EPA to construct the Old Mill Pond (OMP) GWTF at the Caroline Avenue Ball Field on a property identified as Parcel ID # 121200, District 206, Section 12, Block 6 and Lot 9. This property, which occupies approximately 0.5 acres of land. The Village of Port Jefferson went through the process of alienating the property from parkland and a replacement parcel of land located elsewhere in Port Jefferson has been designated as parkland.

Construction activities of the OMP GWTF commenced in October 2010, by Environmental Restoration, LLC, under a contract with EPA. The OMP GWTF was completed in July 2011. The system includes five extraction wells. The extracted groundwater is treated by an air stripper which is followed by two liquid-phase GAC units. The treated effluent is discharged to into the Old Mill Pond and Old Mill Creek under a NYSDEC SPDES permit equivalent. The VOC contaminated air is treated by three vapor-phase GAC units in lead-lag phase before discharge.

Additional Site Activities

Enforcement Action under the New York State Department of Environmental Conservation

The NYSDEC, under enforcement action through the New York State Department of Law, is currently overseeing a spill removal action of oils in the machine pits and leaking machinery To date over 2,000 gallons of machine oil has been removed, characterized and properly disposed offsite. The contractor was put on hold due to the extremely cold winter conditions and is currently resuming work this summer 2015.

Vapor Intrusion Investigation and Mitigation

In January 2007, EPA initiated an investigation to determine if residences and other occupied buildings in the vicinity of the Site might be impacted by the intrusion of VOC vapors resulting from groundwater contamination beneath such properties. Permanent sub-slab soil gas wells were installed in 59 locations. Each soil gas well was installed near the center of the basement, crawl space, or ground floor (when there was no basement). Wells were installed flush with the

concrete slab and capped with a Teflon fitting. After allowing time for the equilibration of soil gas in the vicinity of the completed well, soil gas samples and ambient air samples were collected in SUMMA canisters and analyzed for VOCs.

Results for samples collected at the 59 locations indicated the need for vapor mitigation systems to alleviate the potential for vapor intrusion threat in three residences and in the Earl L. Vandermeulen High School wrestling room in Port Jefferson, New York in April 2008, due to elevated levels of vapors in the subslab. Sampling is conducted at these four locations every year, as well as six other residences located in very close proximity to the homes where the mitigation systems were installed, and when requested by residents in the area. At present, based on the sampling conducted thus far, there are no public health issues related to indoor air quality exceedances within the Site area.

Additional Removal Activities

The Removal Action Branch (RAB) was at the LAI property in December 2013, completing construction-related tasks called for under the ROD. While at the site, RAB discovered an active scrap salvaging operation being conducted in Building G. The salvaging activities involved the mechanical demolition of portions of the building structure to access areas to remove machinery for resale/recycle. These activities were authorized by the owner of the facility and conducted negligently with no regard to the environmental concerns associated with asbestos insulation and other hazardous substances possibly present within the building. The salvaging activities caused Asbestos Containing Material (ACM) to be released onto the floor and to exterior areas, mercury was released from a device which broke and spilled its contents onto the floor, and an acid liquid contained in a drum was released onto the floor. At the request of EPA, the scrap salvaging activities were stopped, and the property owner retained an environmental contractor to contain the releases of hazardous substances that had occurred. On March 27, 2014, following confirmation that the property owner would not take any additional actions to address the threats resulting from the salvaging work, EPA initiated an emergency removal action. The actions taken included the following: temporarily securing Building G by boarding openings in the exterior walls and the roof; re-packaging the asbestos waste, mercury waste, and acid waste and disposing of these materials off-site; and completing a full-scale asbestos survey of all facility buildings and collecting and analyzing 388 samples of presumed asbestos containing material. The emergency field activities were completed on August 28, 2014. The laboratory results of the sampling event were received on August 6, 2014, and those results confirmed the presence of friable ACM in Building G. Conditions at the Site warranted a removal action to abate friable asbestos releases from Building G to the environment. A removal action began in December 2014 to abate and dispose of asbestos-containing material released to the environment in Building G. This removal action was completed in March 2015.

System Operations/Operation and Maintenance

An EPA contractor, HDR, has been conducting the long-term response action (LTRA), including operation, maintenance and monitoring of the GWTF at the source area at the LAI industrial facility and at the OMP GWTF at Old Mill Pond, since October 2012. The LTRA is being conducted to hydraulically contain and to treat groundwater at the source area at the LAI industrial facility and to prevent the migration of contaminated groundwater further

downgradient into Old Mill Pond, Old Mill Creek and Port Jefferson Harbor. Figure 3 shows the LAI and OMP GWTF Locations.

Monitoring points consist of 70 monitoring wells (including multiport wells and extraction wells), influent and effluent streams to and from the air strippers. The effluent from the air stripper is sampled monthly and the extraction wells, re-injection wells and monitoring wells are sampled on a quarterly basis. Sampling parameters include PCE, *cis*-1,2-DCE, TCE, ethylbenzene, xylenes, vinyl chloride, arsenic, chromium, lead, manganese, chlorides, iron, total dissolved solids, total suspended solids, pH and alkalinity.

Potential Site impacts from climate change have been assessed and the performance of the remedy may be impacted by the climate change effects for the region and near the Site from a potential increase in frequency of heavy precipitation and intensity of storms. An operation and maintenance (O&M) plan addendum prepared for the OMP and LAI O&M Plans address these impacts. Updates are summarized in the table below.

Table 1 – Climate Change Effects and Mitigation or Adaptation Measures

Condition	Action	Restart Procedure
Lightning	The LAI Treatment System building has lightning protection. The LAI and OMP treatment systems have a surge protector unit and battery backup/uninterrupted power supply (UPS) system to protect against lightning and power outages. During a lightning storm the system will be shut down until the storm has passed. Outside cameras are present which will allow the operator to verify site conditions. Both systems can be remotely accessed to shut down and restart the systems.	The system will be restarted at the discretion of the operator. System restart can be done on site or remotely. On site cameras with web access will be used to verify availability of power. If power is available, the cameras can be viewed remotely and can determine if the storm has passed before restarting the system. If cameras cannot be viewed remotely, this is an indication of power outage in the general area or due to an issue at the facility. General area power outages can be verified by the utility company. An issue at the facility will require operator attention prior to start-up.
Wind	The systems will be shut down for storms with sustaining wind greater than 50 miles per hour are forecasted by the National Weather Service. System will be shutdown to prevent potential damage from a power outage or interruption resulting from downed power lines.	The system will be restarted at the discretion of the operator. System restart can be done on Site or remotely. See Restart Procedures for Lightning for use of on-site cameras.

Condition	Action	Restart Procedure
Heavy Rain	The system will be shut down for storms greater than or equal to the 25-year storm (6 inches of rain in 24 hours).	Once the rain storm has passed, the system will be restarted at the discretion of the operator. The operator will consult on-site cameras to verify the storm has passed before restarting the system. System restart can be done on site or remotely. See Restart Procedures for Lightning for use of on-site cameras.
Heavy Snow	For forecasts of heavy snow fall (greater than 4 inches), the system will be shut down.	For snow storms the systems shall be restarted when public roads are cleared and access to the site is possible.

Progress Since Last Five-Year Review

No applicable as this is the first five-year review (FYR) for the Site.

Five-Year Review Process

Administrative Components

The five-year review team included Maria Jon (EPA-RPM), Charles Nace (EPA-Human Health Risk Assessor and Ecological Risk Assessor), Edward Modica (EPA-Hydrogeologist), and Cecilia Echols (EPA-Community Involvement Coordinator). This is a Fund-lead Site.

Community Involvement

The EPA Community Relations Coordinator for the LAI Site, Cecilia Echols, prepared a five-year review public notice, and posted it on the EPA web page for the Site. The announcement indicated that EPA is conducting a five-year review of the remedy for the Site to ensure that the implemented remedy remains protective of public health and the environment and is functioning as designed. It was also indicated that once the five-year report is completed, the results will be made available in the local Site repository. In addition, the notice included the RPM's address and telephone number for questions related to the five-year review process or the LAI Site.

Document Review

The documents, data and information which were reviewed in completing this five-year review are summarized in Table 3.

Data Review

The extent of TCE contamination at the LAI Site was determined during the sampling event completed in May 2008, which concluded that a TCE plume emanating from the vicinity of MPW-07 and MPW-02 at the LAI facility had migrated over time downgradient and to the northwest (Figures 2 and 4). As contaminated groundwater moved laterally towards the northwest, it also moved vertically downward due to the hydraulic gradient evident at MPW-07,

MPW-02 and MPW-04. In the vicinity of multiport well MPW-10, about 1,000 feet from the western boundary of the LAI facility, groundwater flow and the TCE plume bent toward the north. The downward gradient also decreased at MPW-10. The plume continued northward toward Port Jefferson Harbor. The contaminant plume was approximately 6,000 feet long and estimated to be about 1,000 feet wide at its widest point. The pre-remediation groundwater sampling data collected in 2008 is being used as a baseline for comparison to TCE concentrations in the plume over time and to monitor the efficacy of the treatment system.

The TCE plume configuration defined by data from the 2014 comprehensive sampling event (Figure 4) is similar to the plume configuration in 2013, 2012 and 2008, with a few key differences. The current plume is approximately the same length as the plume in 2013, 2012 and 2008 and extends from the LAI facility to Port Jefferson Harbor. The width of the plume continues to become narrower, as evidenced by a lower maximum concentration at MPW-05 along the western flank and MPW-06 along the eastern flank of the plume (Figure 4).

In 2014, as compared to 2013, the general area of high concentrations at the LAI facility, near MPW-07 and MPW-02 has shrunk to the south, in the vicinity of MW-ISCO-02. In 2008, the highest TCE concentration in groundwater on the LAI property was observed at MPW-07 with TCE at 1,100 µg/L, while the highest TCE concentration in 2013 was 480 µg/L at MW-ISCO-4. The maximum TCE concentration detected at the LAI facility during the 2014 sampling event was at MW-ISCO-2, which increased from 250 µg/L in 2013 to 1,500 µg/L in 2014.

TCE concentrations on the LAI property have generally decreased with the exception of MW-ISCO-02. In the northern portion of the plume near Old Mill Pond, maximum TCE concentrations have decreased at MW-PD-16 from 1,900 µg/L in 2008 to 130 µg/L in 2014. Concentrations of TCE in both the LAI extraction wells and Old Mill Pond extraction wells have decreased over time.

It should be noted that a new extraction well ERT-EW-6 was installed at the Old Mill Pond facility in September 2013 (see Figure 4) to aid in capturing the western flank of the plume. Based on the 2008 findings, an upward hydraulic gradient has been observed near MPW-09, indicating that contaminated groundwater is moving upward as it moves northward in the vicinity of this well. This upward gradient causes groundwater to discharge at the surface in the vicinity of the Old Mill Pond. Operation of ERT-EW-6 appears to have had some direct influence on the MPW-09 cluster location. TCE concentrations in MPW-09-B and MPW-09-C ports have increased from 360 µg/L in 2013 to 950 µg/L in 2014 and from 490 µg/L in 2013 to 510 µg/L in 2014, respectively. This is expected to be a result of the new extraction well being screened at depth intervals that are in direct correlation with the depth intervals of these ports. In addition, with increased pumping, the slug of TCE that was centered on MW-PD-16 (as shown in the 2012 and 2013 sampling events) appears to have continued to migrate north.

Overall, TCE concentrations in the vicinity of the OMP GWTF and farther north have decreased since 2013 as shown by a reduced 500 µg/L isoconcentration contour in Figure 4 as compared to 2013. Groundwater downgradient of MPW-09 and the OMP Extraction wells have shown slight decreases and change in the concentration gradients since 2013 as a result of pumping of the newly installed extraction well ERT-EW-6. For example, TCE concentrations in ERT-EW-1 decreased from 330 µg/L in 2013 to 190 µg/L in 2014, TCE concentrations in ERT-MW-2B decreased from 330 µg/L in 2013 to 300 µg/L in 2014, and TCE concentrations in ERT-MW-1B

decreased from 26 µg/L to 20 µg/L in 2014. As observed farther west in ERT-MW3 and farther east in MW-5A/B and MW-4A/B, detectable concentrations of TCE are less than the groundwater MCL standard of 5 µg/L.

Overall, area-wide, total concentrations of site-related VOCs in groundwater have decreased from the sampling event in May 2008 to the comprehensive sampling event in June 2014. Monitoring well MW-ISCO-5 is located at the likely location of the source area of the plume within the LAI facility, where ISCO was completed in August 2010, and pump and treat remedial activities are being conducted, which have caused significant reductions in TCE concentrations. For example, the maximum concentration of TCE detected in May 2008 was observed in MPW-07 at a concentration of 1,100 µg/L (Figure 3). In contrast, the concentration of total VOCs at MWISCO-5, located near MPW-07, as of June of 2014, was reported at 295 µg/L. (Note that MPW-07 is no longer sampled because the sampling ports are defective.) Plots of total site-related VOC concentrations over time (Figures 5 to 8) were prepared for MPW-02, MW-PD-12, MW-PD-16, and MPW-09 since these wells were determined to be most representative of the center line of the plume.

Similarly, at MPW-02, which is located just downgradient of MW-ISCO-5, concentrations of total VOCs in samples from this well were 853 µg/L in May 2008 and were greatly reduced as of this most recent sampling event (June 2014); all of the ports at MPW-02 have low concentrations of total VOCs ranging from 1-3 µg/L.

The decrease in the respective concentrations of total VOCs in MW-ISCO-5 and MPW-02 indicate that the ISCO treatment in this area combined with the pump and treat system have been effective at reducing concentrations of VOCs in groundwater. Refer to Figure 8 for a graphical depiction of these reductions over time at MPW-02.

Total concentrations of VOCs increase as groundwater flows to the northwest (downgradient), as was initially observed at MW-PD-12 prior to ISCO treatment (in July/August 2010); however, total concentrations of VOCs at this well have decreased since this time. The total concentration of VOCs at MW-PD-12 increased from 215 µg/L in May 2008 to a peak concentration of 602 µg/L in September 2011. Since that time concentrations have decreased to 220 µg/L in June 2014 (Figure 6). The peak concentration followed by a steady decrease may represent the movement of a mass or slug of VOCs in groundwater past this well as groundwater flows downgradient from the LAI facility. The concentration of total VOCs at MW-PD-14 decreased slightly from 358 µg/L in June 2008 to 190 µg/L in June of 2014. This result suggests that concentrations of total VOCs are decreasing slowly in the vicinity of this well due to its distance from the active treatment system at the LAI facility and the extraction wells at the Old Mill Pond.

The TCE concentrations detected at the LAI facility indicate that the LAI extraction wells are capturing the source plume and splitting the plume into two parts as evidenced by the 100 µg/L isoconcentration contour in Figure 4. The source contamination is being contained by the operation of the LAI extraction wells. A separate slug that is beyond the influence of these extraction wells is moving north, towards Old Mill Pond and is expected to be captured by the Old Mill Pond extraction wells over time.

At the downgradient or northern end of the plume, TCE concentrations have greatly decreased

since 2008. This can be seen in the results for MW-PD-16, where concentrations of total VOCs decreased from 1,933 µg/L in May 2008 to 130 µg/L in June 2014 (Figure 11). This suggests that the mass of VOCs may have traveled downgradient toward the Old Mill Pond extraction wells and MPW-09 since 2008. The Old Mill Pond extraction wells are likely accelerating the groundwater flow in this immediate area. Concentrations of total VOCs at well MPW-09, located near Old Mill Pond, had generally been decreasing or remaining constant at all ports up to 2013. However, during the June 2014 reporting period there was a significant increase in concentrations observed in the MPW-09-B and C ports (Figure 12). TCE concentrations at port B increased from 360 µg/L in 2013 to 950 µg/L in 2014 and at port C TCE concentrations increased from 490 µg/L in 2013 to 510 µg/L in 2014. This is likely due to the operation of the new extraction well ERT-EW-06, which appears to have reversed the direction of flow of contaminants that passed by this location prior to the installation of this well. This is evidenced by the reversal of hydraulic gradient observed between MPW-09-Ports C and D and a subsequent increase in TCE concentrations detected in MPW-09-Ports B and C.

A total of 65 groundwater samples were collected for 1,4-dioxane analysis during the June 2014 comprehensive sampling event. For 1,4-dioxane, a standard of 0.78 µg/L was used per EPA Human Health Risk Assessment screening purposes for both groundwater and surface water results. 1,4-dioxane was detected in 18 of the 65 groundwater samples collected (all qualified "J" estimated, below the quantitation limit) with five samples exceeding the screening criterion of 0.78 µg/L. The highest concentration of 1,4-dioxane, 1.3 µg/L, was detected in a groundwater sample from monitoring well MPW-01-C. Monitoring for 1,4-dioxane will continue to be conducted.

Six surface water samples (four fresh water samples from Old Mill Pond and two salt water samples from Port Jefferson Harbor) were collected for VOCs and 1,4-dioxane during the June 2014 comprehensive sampling event. The Site-related VOCs, TCE and PCE were detected in five of the six sampled locations. Surface water contamination at the Old Mill Pond during the RI has been attributed to the LAI plume. A decrease of TCE levels in Old Mill Pond surface water is noted. Current surface water samples at the Old Mill Pond detected TCE at location SW06 at 120 µg/L compared to the RI concentration of 340 µg/L at this location; location SW07 detected TCE at 180 µg/L compared to the RI concentration of 280 µg/L; and SW08 detected TCE at 23 µg/L compared to the RI concentration of 230 µg/L. TCE detections were reported in the surface water samples collected in the Port Jefferson Harbor. During the current sampling event, CVOCs detected in the two samples from Port Jefferson Harbor are comparable to the RI, except for TCE detected at 15 µg/L in SW-16 (RI result was non-detect at this location). The Port Jefferson Harbor sampling location SW-16 was collected in the vicinity of a marina and significant motor boating activities as well as a major storm water discharge outfall, which might be contributing to CVOCs detections. These concentrations will be monitored periodically. With respect to 1,4-dioxane, this chemical was detected in two of the six surface water samples collected, both qualified "J," estimated below the quantitation limit, with none of the samples exceeding the screening criterion of 0.78 µg/L. The highest concentration of 1,4-dioxane, 0.61 µg/L, was detected in the surface water sample at location SW-07.

Site Inspection

The inspection of the Site was conducted on September 9, 2014. In attendance were Maria Jon (EPA-RPM), Terry Kish (EPA-OSC), Charles Nace (EPA-Human Health Risk Assessor and

Ecological Risk Assessor), Demetrios Klerides (HDR), Steve Scharf (NYSDEC), John Conover (NYSDEC), and Nick Acampora (NYSDEC). The purpose of the inspection was to assess the protectiveness of the remedy.

Interviews

Interviews were not conducted.

Institutional Controls Verification

Institutional controls consisting of an environmental easement/restrictive covenant filed in the property records of Suffolk County that will limit the use of the active industrial area to commercial and/or industrial uses only; and an evaluation for soil vapor intrusion of any new or renovated building or on-site structure that will be occupied in the future, are not yet in place. EPA is working with the State to implement the institutional controls on the LAI property limiting future use of the property to industrial/commercial usage.

Although not envisioned in the ROD, the Town of Brookhaven has implemented a local ordinance requiring any new buildings to be evaluated for potential vapor intrusion before a certificate of occupancy is issued. The Town's recent Land Use Plan for the area calls for eliminating residential zoning on the LAI properties and replacing it with light industrial uses such as factories, offices and storage facilities. The plan also calls for developing green energy projects such as solar panel farms.

Technical Assessment

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

The 2006 ROD specifies separate remedies for the cleanup of groundwater and soil at the LAI Site. The groundwater remedy calls for two extraction and treatment systems (one at the LAI facility and one near Old Mill Pond), application of ISCO injections within area of high TCE concentration, institutional controls, a site management plan, long-term groundwater and surface water monitoring, and investigation of vapor intrusion into structures within the area. These remedial activities were necessary to attain the remedial action objectives of preventing human exposure to VOC-contaminated groundwater, minimizing off-site migration of contaminated groundwater, restoring groundwater and surface water to levels that meet ARARs, and preventing contaminated groundwater from discharging into Port Jefferson Harbor.

Construction of the GWTF and ISCO treatment activities at the LAI facility were performed from December 2009 to September 2010. The operation of the LAI facility GWTF was commenced in September of 2010 and operation and maintenance of the system continuing from then on. The operation of the GWTF at the Old Mill Pond area commenced in August of 2011. Operation and maintenance reports of the GWTF at the LAI Site show that the system is functioning as designed. The two extraction wells have been operating at the design flow rates while total VOC influent mass removal rates of nearly 100 percent are achieved by the air stripper. The extraction system is effective in maintaining capture of contaminated groundwater. Reports for the GWTF at Old Mill Pond show similar good performance. Three of the five extraction wells are currently active and provide hydraulic plume control of the source area.

As part of the long-term groundwater (and surface water) monitoring plan, water-quality data has been collected to monitor changes in contaminant concentrations and distribution over time. Water-quality data collected over the last five years have shown that Site-related VOC concentrations in groundwater have been decreasing from pre-design levels. For example, in well MPW-02D located at the LAI facility, TCE concentrations have decreased from 820 ppb (in 2008) to non-detect (in 2014), while in well MW-PD-16 located at Old Mill Pond, TCE concentrations have decreased from 1,900 ppb to 130 ppb over the same period. The rates of VOC-concentration decrease tend to vary in different parts of the plume and some wells show less of a decrease in TCE over the same period (TCE in well MW-PD-14 changed from 350 ppb to 190 ppb from 2008 to 2014). Nevertheless, the water-quality data for this initial five-year review period show that the remedy is producing positive results in that the contaminants in the groundwater plume has decreased in both spatial extent and concentration since the implementation of the groundwater remedy. In addition, surface water quality at the Old Mill Pond has improved. The most recent surface water samples at the Old Mill Pond detected TCE at location SW06 at 120 ppb compared to the RI concentration of 340 ppb at this location; location SW07 detected TCE at 180 ppb compared to the RI concentration of 280 ppb; and SW08 detected TCE at 23 ppb compared to the RI concentration of 230 ppb.

Consistent with the selected remedy, EPA evaluated the potential for vapor intrusion at properties overlying the downgradient plume. Based on sub slab sampling results, four systems were installed. EPA continues to sample the subslab and indoor air at these four locations every year, as well as six other residences located in very close proximity to the homes where the mitigation systems were installed, and when requested by residents in the area.

The soil remedy called for excavation of LAI facility soils and catch basin sediments exceeding PRGs, off-site disposal, backfilling of excavations with clean fill, evaluation/remediation of electrical transformers, and institutional controls. These remedial activities were required in order to attain the remedial action objectives of minimizing human exposure with PCB-contaminated soils, minimizing potential release of contamination in LAI catch basin sediments to soil and/or groundwater, and preventing ecological and human exposures to contaminated sediment. These activities were successfully completed by April 2014. EPA is working with the State to implement the institutional controls on the LAI property limiting future use of the property to industrial/commercial usage.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives used at the time of the remedy still valid?

Human Health – (a) The exposure assumptions and exposure pathways that were used in the risk assessment were reviewed and are still valid. The pathways that were evaluated included: industrial/commercial, recreational and future residential for inhalation, dermal and ingestion of groundwater; inhalation, dermal, and ingestion of surface soil; and inhalation, dermal and ingestion of sediment and surface water. These pathways are still valid. (b) The toxicity data for the Site-related contaminants remains valid, except for the value associated with TCE. The TCE value has recently changed, however, even with the change in the TCE value, the outcome of the risk assessment would still be valid and the cleanup levels are not impacted by the toxicity change. (c) The cleanup levels that were used for the soil, sediment and surface water were NYSDEC values and the groundwater cleanup levels were the lower of the State and Federal maximum contaminant levels (MCLs). The values chosen in the ROD are still valid. (d) The

RAOs for soil were to reduce exposure to PCBs in the soil; for groundwater to reduce exposure, control migration, restore to groundwater use standards, and prevent migration to Port Jefferson Harbor; and for sediment and surface water to reduce exposure to humans, prevent migration, and restore to surface water quality standards. These RAOs are still valid.

Vapor intrusion was evaluated, and continues to be evaluated, as part of the remedy management. EPA will implement an appropriate remedy (such as subslab ventilation systems) based on the investigation results. Any new or renovated building or any structure that will be occupied in the future at the LAI facility should be evaluated for soil vapor intrusion under a new local ordinance.

Ecological – The ecological evaluation that was conducted for the remedial investigation indicated that there are contaminants present in the surface water and sediments of Old Mill Creek and Old Mill Pond and surface soil of the LAI Facility that may cause adverse health effects to the flora and fauna in the area. These adverse health effects could consist of impacts in growth, reproduction, and survival of plants, aquatic invertebrates, fish, soil invertebrates, and terrestrial birds and mammals. Further evaluation determined that surface water in Old Mill Creek and Old Mill Pond has the potential to cause ecological adverse health effects due to *cis*-1,2-DCE and at LAI Facility soils due to PCBs.

As part of this five-year review evaluation, the most recent monitoring data was evaluated. The concentrations of TCE in Old Mill Pond have decreased since the implementation of the groundwater extraction remedy. The decrease observed in the old Mill Pond surface water is evidence that the remedy is functioning as intended. The on-site soil that contained PCBs at elevated levels has been excavated, disposed off site and backfilled with clean soil. Thus the exposure pathway for ecological receptors exposed to on-site soil has been eliminated. All of the cleanup values and RAOs associated with ecological receptors are still valid.

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

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

Technical Assessment Summary

The remedy was designed to remove contaminated soil, to control migration of contaminated groundwater, treat groundwater contamination, and restore groundwater and surface water through pumping and treatment. Currently, the soil exposure pathways for human health has been eliminated due to removal of contaminated soil and the groundwater pathway is not complete due to the drinking water source for residents in the area being from a municipal water source with wells at a significant distant from the Site. There is still contaminated groundwater discharging to the Old Mill Pond located downgradient, although concentrations have decreased since implementing the pump and treat remedy.

Additionally, vapor intrusion sampling is conducted every year at homes near the Site. At present, based on the sampling conducted thus far, there are no public health issues related to indoor air quality exceedances within the site area. The groundwater plume located at a significant depth below ground surface in most of the Site area, has decreased in both size and

concentration since the implementation of the groundwater remedy. Given the progress observed so far, the remedy is functioning as intended, although cleanup goals for the groundwater have not yet been reached.

Issues, Recommendations and Follow-Up Actions

OU(s): LAI former industrial area	**Issue Category: Institutional Controls**			
	Issue: The deed notice contemplated by the Decision Document for the LAI former industrial area has not been implemented.			
	Recommendation: The declaration of covenants, restrictions, and environmental easements should be implemented.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	Other	EPA	12/30/2017

Protectiveness Statement

Protectiveness Statement(s)	
Operable Unit: LAI industrial area	*Protectiveness Determination:* Short-term Protective
Sitewide Protectiveness Statement	
The remedy for LAI Site is protective of human health and the environment in the short term. However, in order for the remedy to be protective in the long term, a declaration of covenant, restrictions, and environmental easements need to be filed for the LAI manufacturing property that will limit the use of the industrial area to commercial and/or industrial uses only.	

Next Review

The next five-year review report for the Lawrence Aviation Industries Superfund Site is required five years from the completion date of this review.

Tables

Table 2: Chronology of Site Events

Event	Date(s)
Initial discovery of problem or contamination	1984
Pre-NPL responses	1991
Final NPL listing	March 2000
Removal actions	March 2004
Remedial Investigation/Feasibility Study complete	May 2005
ROD signature	September 2006
EPA issued notice of liens on the LAI Facility property	March 2003
EPA issued notice of liens on the Outlying Parcels and filed these notices at the Office of Clerk of Suffolk County.	April 2005
Superfund State Contract (Amendment No. 3)	December 2012
On-site remedial action construction start	December 2009
RA Construction completion date	September 2014
Preliminary Close-out Report	August 2014

Table 3a: Remediation Goals for Soil (all concentrations in ppm) From the ROD			
Contaminants of Concern	**Soil - Protection of Groundwater**	**Human Health Risk**	**Remediation Goals**
PCB (in surface soil)	-	-	1

Table 2b: Remediation Goals for Groundwater (all concentrations in µg/L) From the ROD		
Contaminants of Concern	**National Primary Drinking Water Standards (Federal MCLs)**	**Remediation Goals**
Tetrachloroethene	5	5
Trichloroethene	5	5

Table 3b: Documents, Data and Information Reviewed in Completing the Five-Year Review

Document Title, Author	Submittal Date
Record of Decision Document, Lawrence Aviation Industries, Port Jefferson Station, NY, U.S. Environmental Protection Agency	September 2006
Final Remedial Investigation/Feasibility Study Report, Lawrence Aviation Industries, Port Jefferson Station, NY, CDM Federal Programs Corporation	June 16, 2004
Remedial Action report, Lawrence Aviation Industries, Port Jefferson Station, NY, U.S. Environmental Protection Agency	September 29, 2014
2014 Comprehensive Sampling Event report, Long-Term Response Action, Lawrence Aviation Industries, Port Jefferson Station, NY, Henningson, Durham & Richardson, Architecture and Engineering PC (HDR)	September 2014

adapted from NYSDEC Interactive Mapping Gateway, http://www.nysgis.state.ny.us/gateway/index.html

CDM

Figure 1
Site Location Map

Lawrence Aviation Industries Superfund Site
Port Jefferson Station, New York

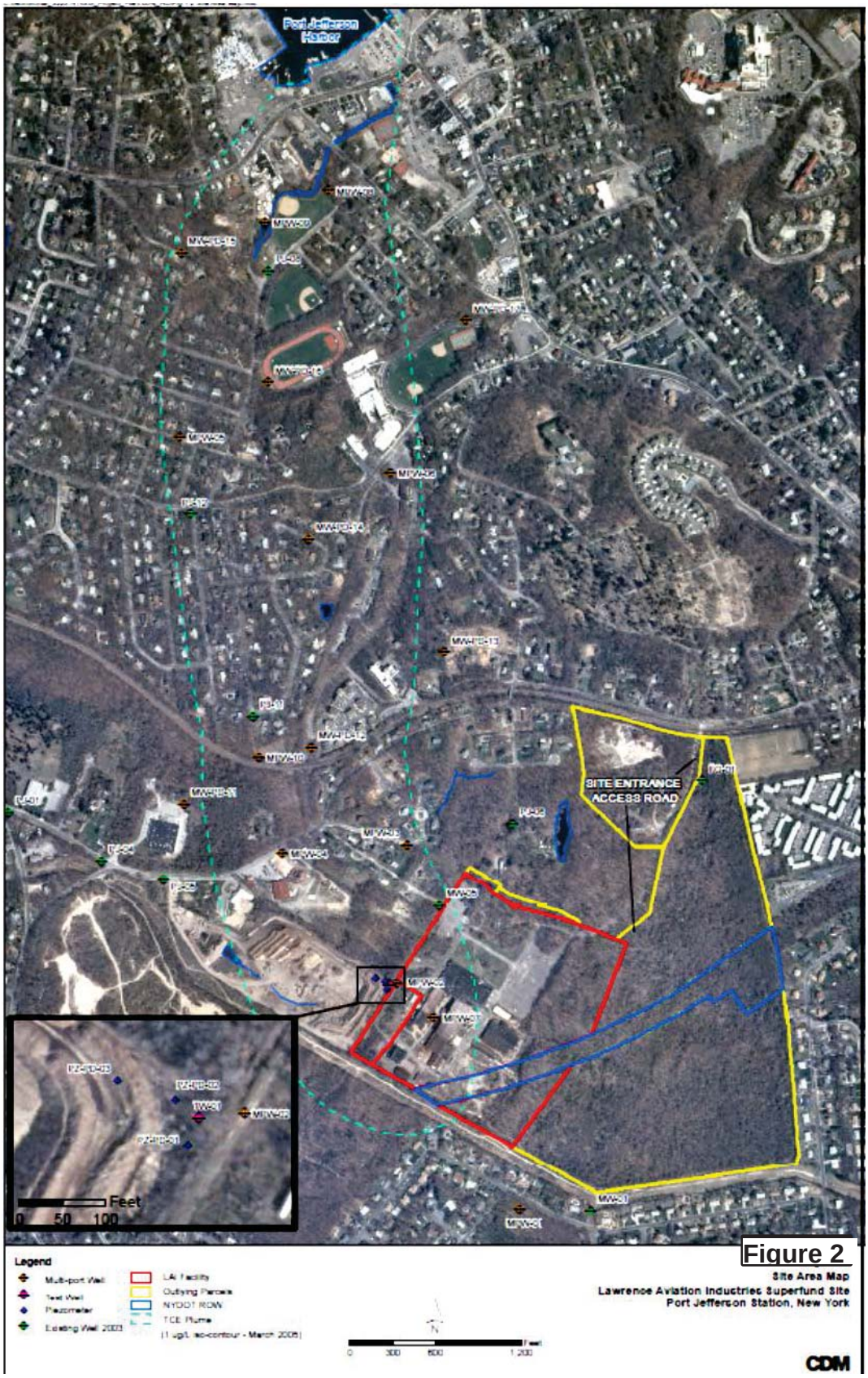
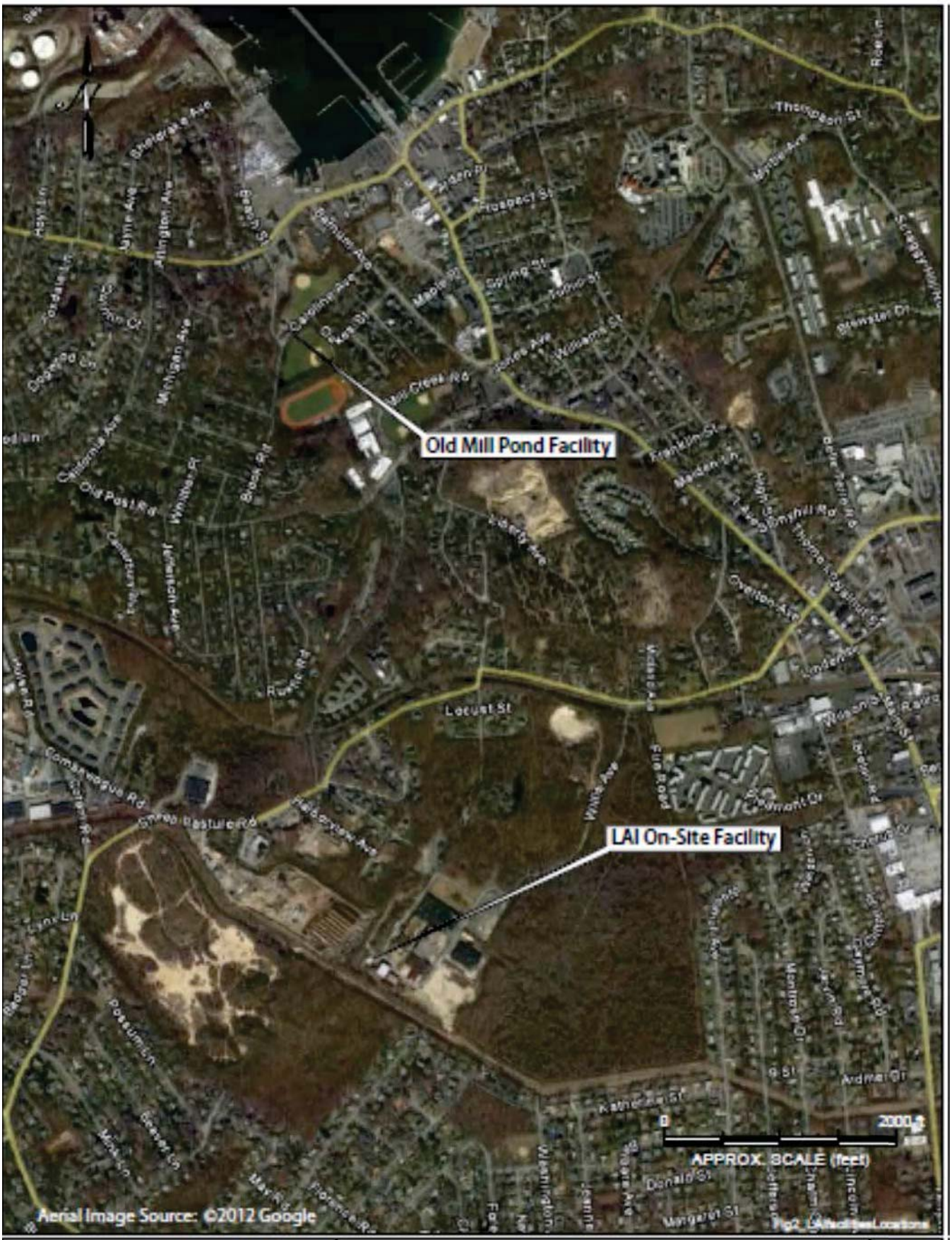


Figure 2

Site Area Map
Lawrence Aviation Industries Superfund Site
Port Jefferson Station, New York



HDR

Hennigson, Durham & Richardson Architecture and Engineering, P.C.
One Blue Hill Plaza
Pearl River, NY 10965

LAI Facilities Locations

Lawrence Aviation Industries Superfund Site — Port Jefferson Station, New York

Figure 3

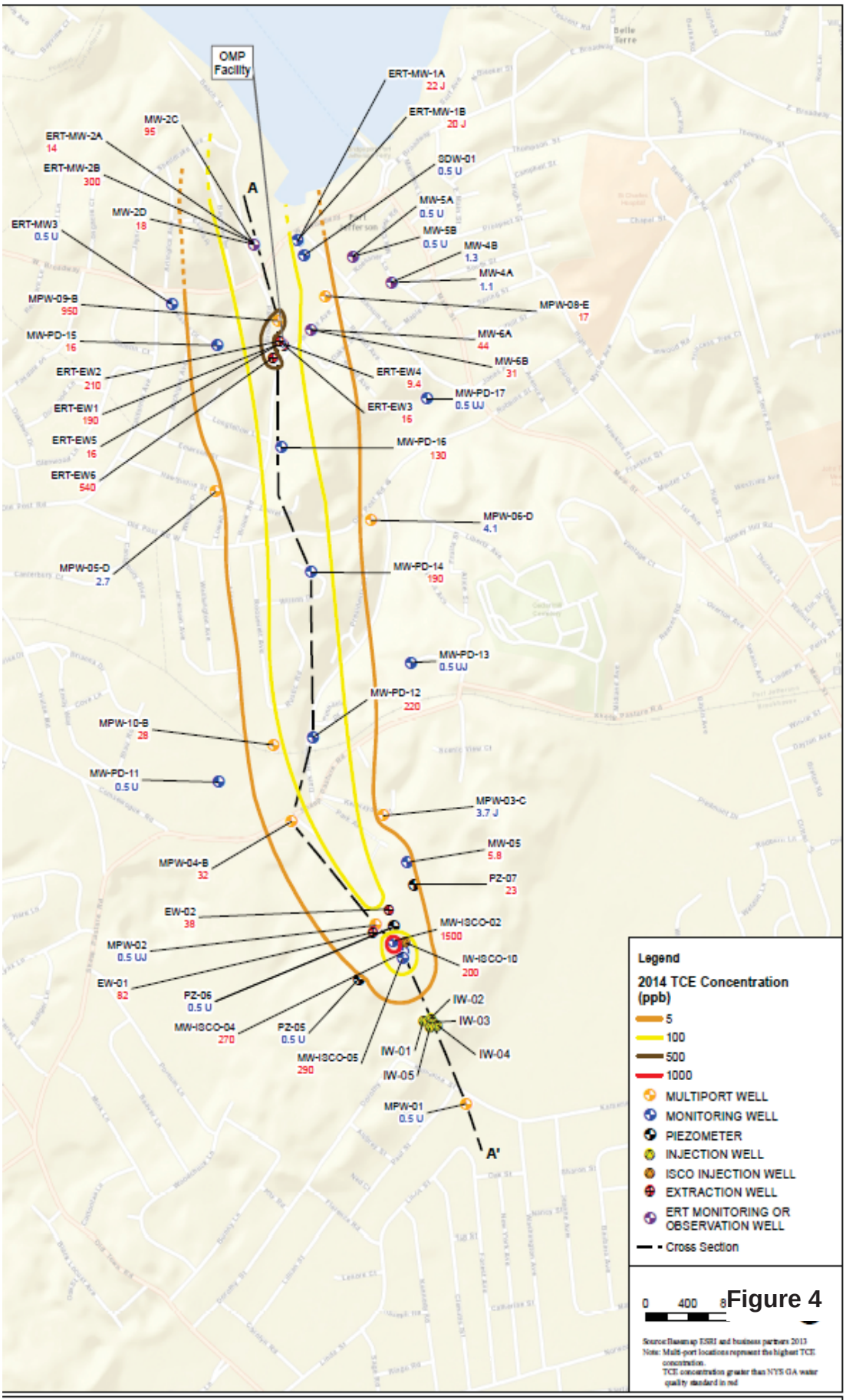


Figure 4

LAWRENCE AVIATION INDUSTRIES SITE
PORT JEFFERSON STATION, NY

Figure 6
June 2014 Comprehensive Sampling TCE Isoconcentration Contours
September 2014

Figure 5 Soil Excavation of Areas of Concern

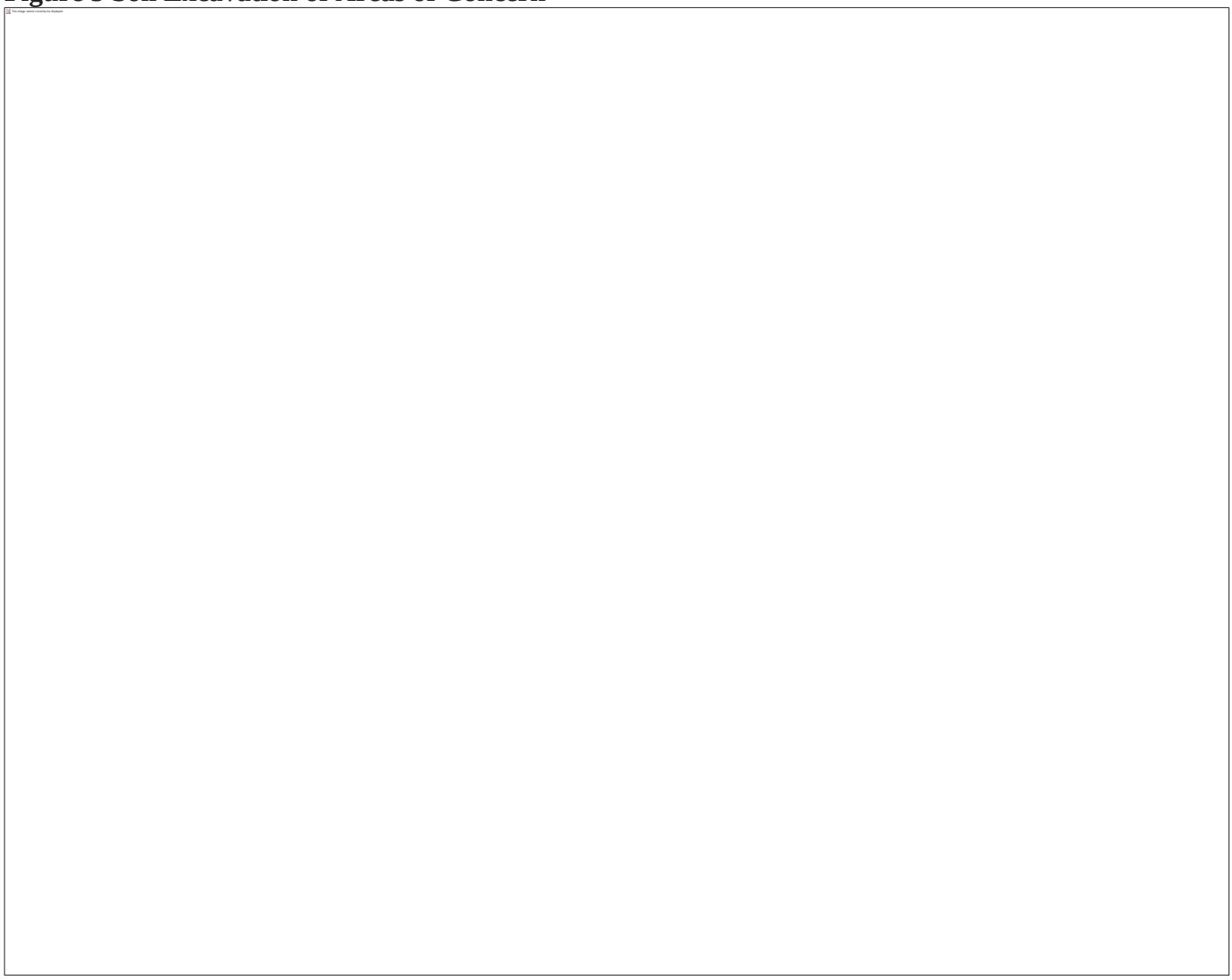
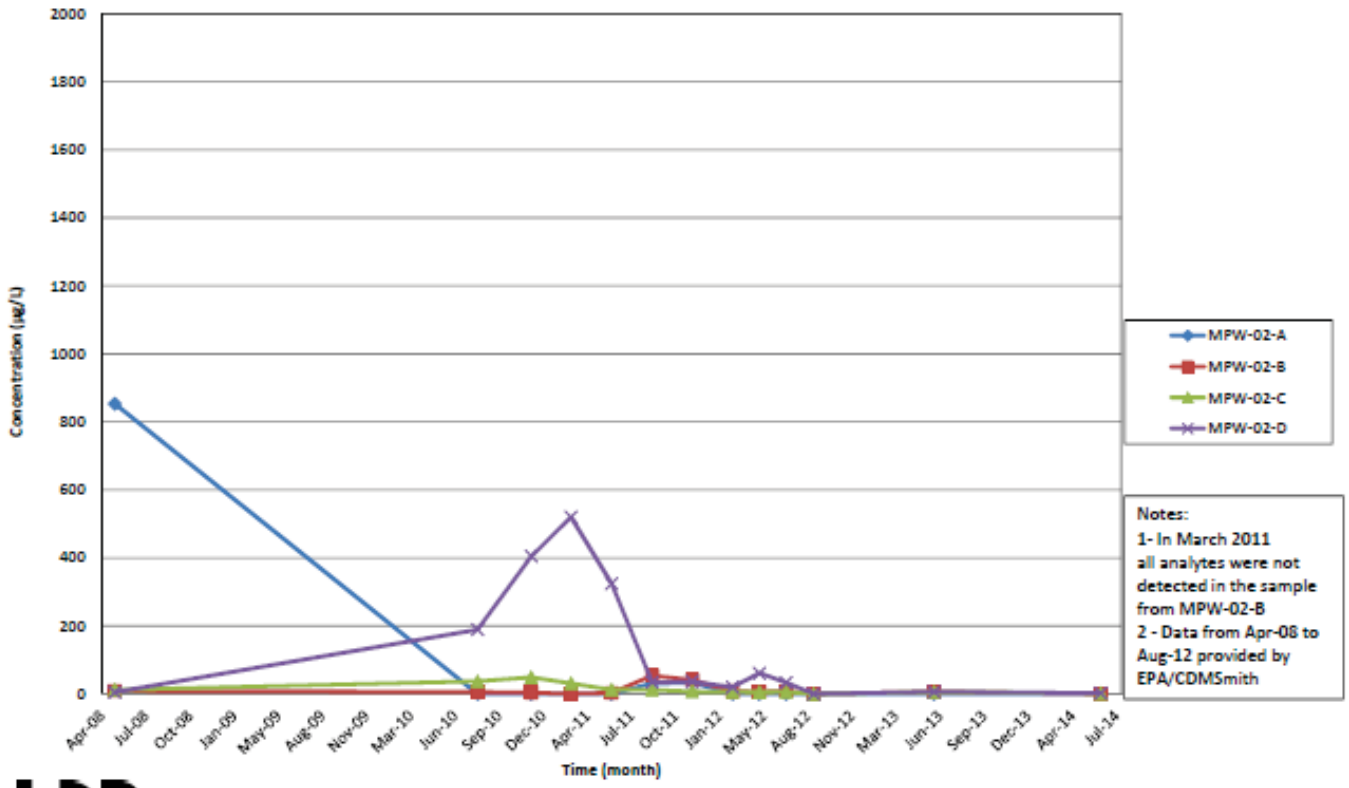


Figure 6

Total VOC Concentration Trend: MPW-02
Lawrence Aviation Industries Site
Port Jefferson Station, New York

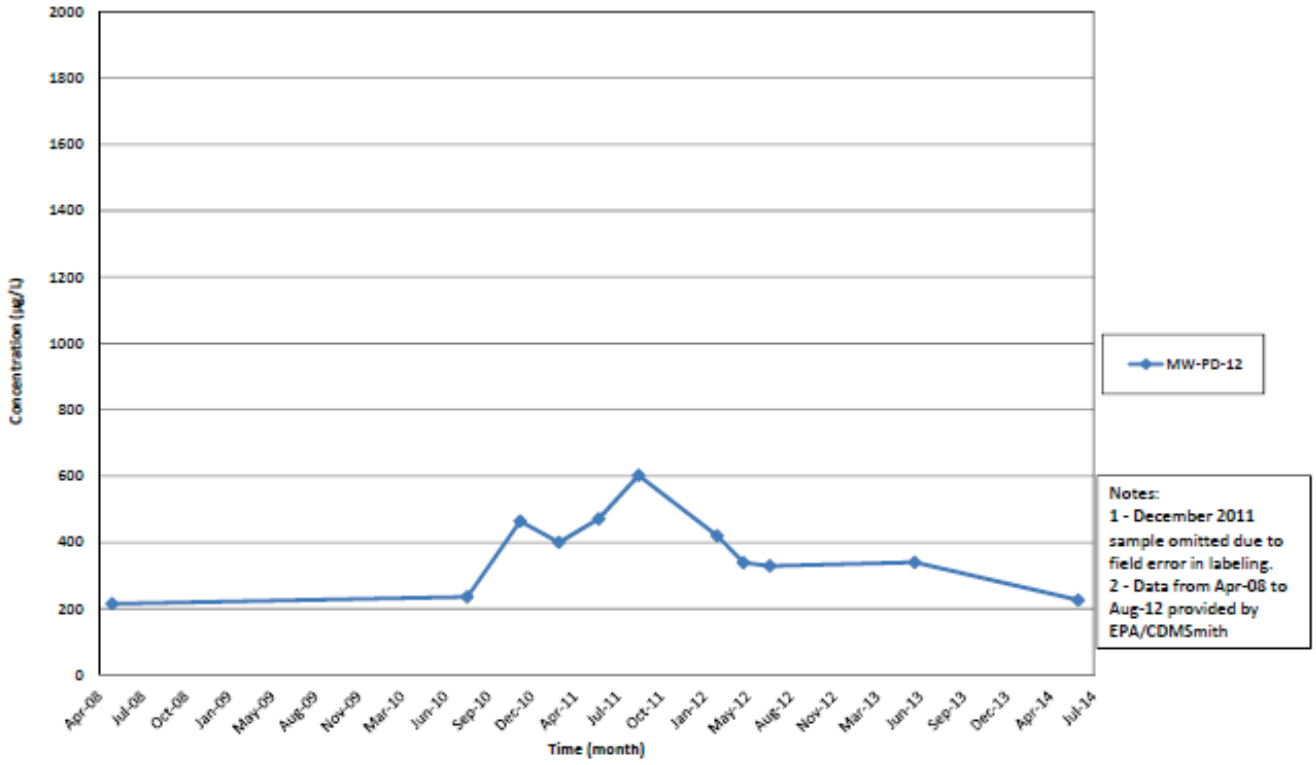


HDR

September 2014

Figure 7

Total VOC Concentration Trend: MW-PD-12
Lawrence Aviation Industries Site
Port Jefferson Station, New York



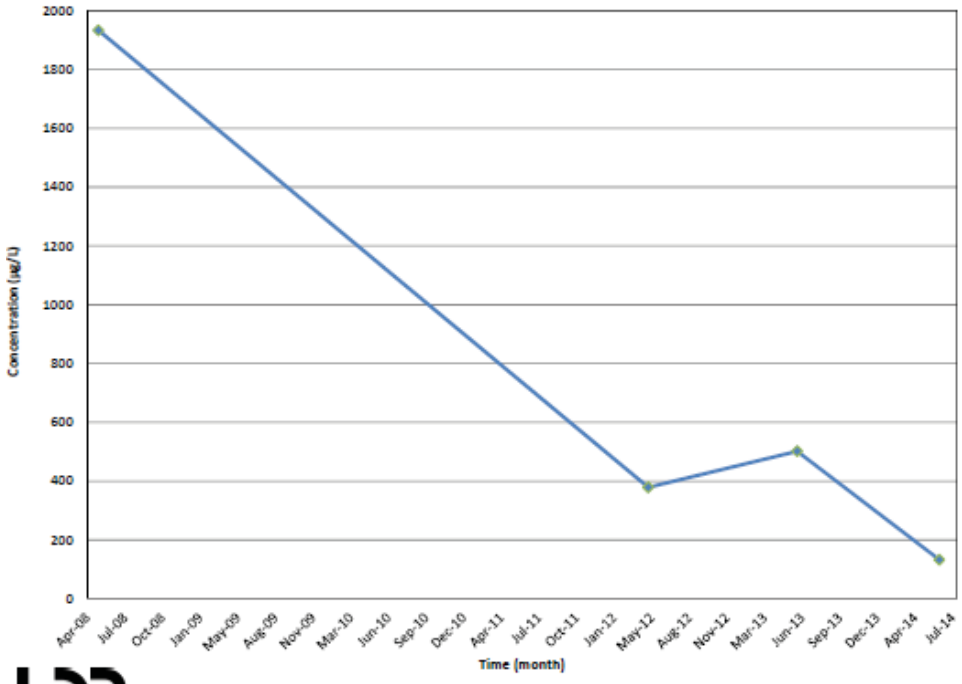
HDR

September 2014

Figure 6

Figure 8

Total VOC Concentration Trend: MW-PD-16
Lawrence Aviation Industries Site
Port Jefferson Station, New York

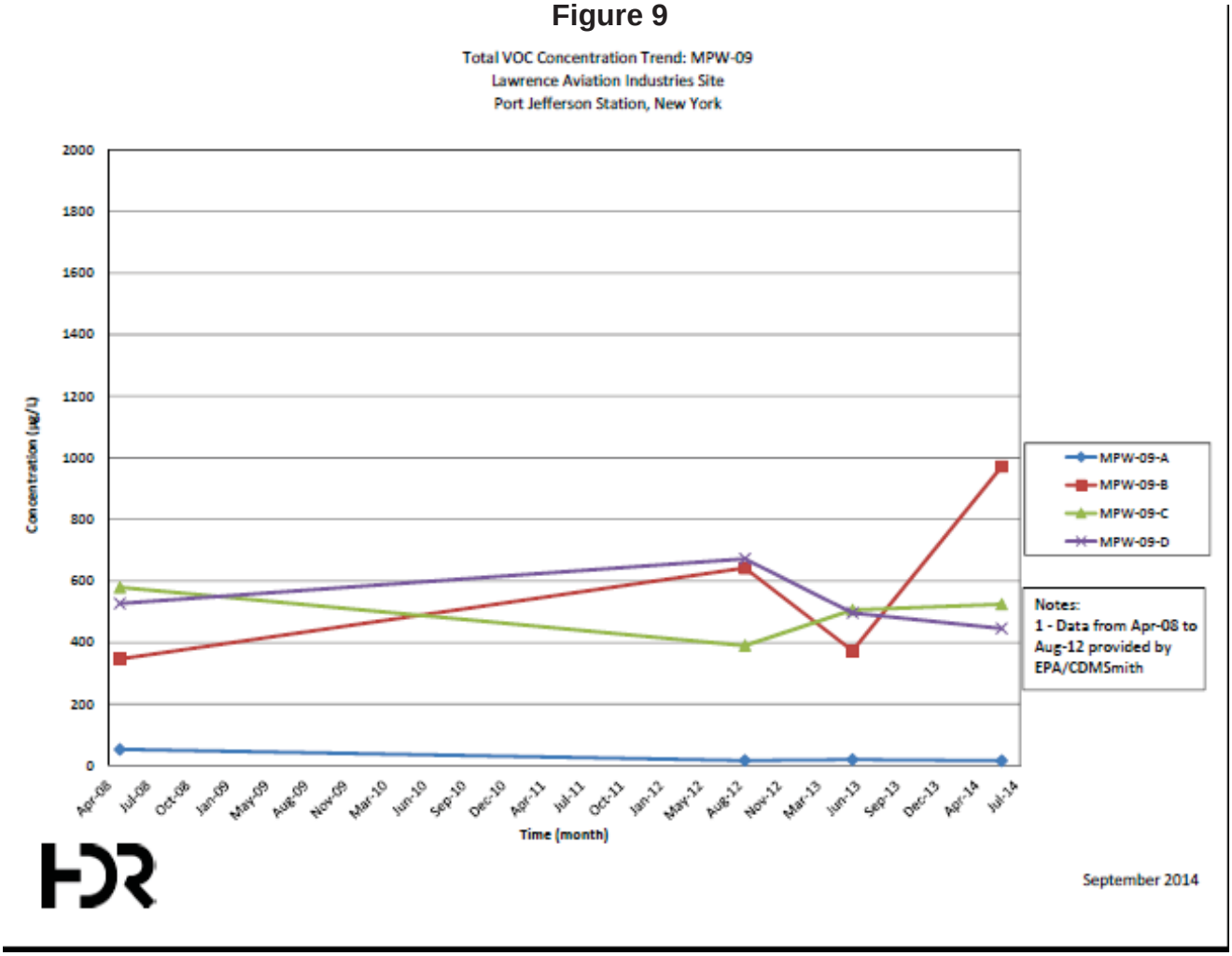


Notes:
1 - Data from Apr-08 to Aug-12 provided by EPA/CDM Smith

HDR

September 2014

Figure 9


Total VOC Concentration Trend: MPW-09
Lawrence Aviation Industries Site
Port Jefferson Station, New York
Concentration (µg/L)
2000
1800
1600
1400
1200
1000
800
600
400
200
0
Apr-08
Jul-08
Oct-08
Jan-09
May-09
Aug-09
Nov-09
Mar-10
Jun-10
Sep-10
Dec-10
Apr-11
Jul-11
Oct-11
Jan-12
May-12
Aug-12
Nov-12
Mar-13
Jun-13
Sep-13
Dec-13
Apr-14
Jul-14
Time (month)
MPW-09-A
MPW-09-B
MPW-09-C
MPW-09-D
Notes:
1 - Data from Apr-08 to Aug-12 provided by EPA/CDMSmith
September 2014