Five-Year Review Report
Pollution Abatement Services Superfund Site
City of Oswego
Oswego County, New York

Prepared by:

United States Environmental Protection Agency
Region 2
New York, New York

December 2008

Five-Year Review Summary Form

SITE IDENTIFICATION

Site Name *(from WasteLAN)*: Pollution Abatement Services

EPA ID *(from WasteLAN)*: NYD000511659

Region: 2 **State:** NY **City/County:** Oswego/Oswego County

SITE STATUS

NPL Status: ■ Final ☐ Deleted ☐ Other (specify)

Remediation Status (choose all that apply): ☐ Under Construction ■ Operating ☐ Complete

Multiple OUs? ■ YES ☐ NO **Construction completion date:** 09/1997

Has site been put into reuse? ☐ YES ■ NO ☐ N/A

REVIEW STATUS

Lead agency: ■ EPA ☐ State ☐ Tribe ☐ Other Federal Agency

Author name: Patricia Simmons Pierre

Author title: Remedial Project Manager **Author affiliation:** EPA

Review period: 12/23/2003 to 12/23/2008

Date(s) of site inspection: 06/07/2008

Type of review:

☐ Post-SARA ☐ Pre-SARA ☐ NPL-Removal only
☐ Non-NPL Remedial Action Site ☐ NPL State/Tribe-lead
☐ Regional Discretion ■ Statutory

Review number: ☐ 1 (first) ☐ 2 (second) ■ 3 (third) ☐ Other (specify)

Triggering action:

☐ Actual RA Onsite Construction at OU #____ ☐ Actual RA Start at OU#
☐ Construction Completion ■ Previous Five-Year Review Report
☐ Other (specify)

Triggering action date *(from WasteLAN)*: 12/23/2003

Due date *(five years after triggering action date)*: 12/23/2008

Does the report include recommendation(s) and follow-up action(s)? ■ yes ☐ no
Is human exposure under control? ■ yes ☐ no
Is contaminated groundwater under control? ■ yes ☐ no ☐ not yet determined
Is the remedy protective of the environment? ■ yes ☐ no ☐ not yet determined
Acres in use or available for use: **restricted:** 0 **unrestricted:** 0

Five-Year Review Summary Form (continued)

Issues, Recommendations, and Follow-Up Actions

In order for the site to be protective in the long-term, hydraulic control within the containment system should be consistently maintained. The monthly leachate contingency removal event protocol should be reinstated in order to more effectively maintain hydraulic control of the containment system.

Protectiveness Statement

The implemented containment remedies for Operable Unit (OU) 2 and OU 3 are protective of human health and the environment in the short-term. Currently there are no exposure pathways that could result in unacceptable risks and none are expected, as long as engineering and institutional controls are properly maintained and all residents are connected to public water. In order for the site to be protective in the long-term, hydraulic control within the containment system should be consistently maintained. Aquifer restoration is contingent upon proper maintenance of the hydraulic control within the containment system.

The site-wide remedial actions protect human health and the environment in the short-term. 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 implemented engineering and institutional controls are properly monitored and maintained. In order for the site to be protective in the long-term, hydraulic control within the containment system should be consistently maintained.

I. Introduction

This five-year 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). The purpose of a five-year review is to assure that implemented remedies protect public health and the environment and that they function as intended by the decision documents. This report will become part of the site file.

This is the third five-year review for the Pollution Abatement Services (PAS) site. After the completion of the remedial action, contaminants remained on-site; therefore, a statutory five-year review is required. In accordance with Section 1.3.3 of the five-year review guidance, a subsequent five-year review is triggered by the signature date of the previous five-year review report. The trigger for this five-year review is the date of the previous five-year review report, which is December 23, 2003.

The site is divided into four operable units (OUs). OU 1 involved removal actions taken from 1973 to 1982 by the Environmental Protection Agency (EPA) and the New York State Department of Environmental Conservation (NYSDEC); this OU is not subject to five-year reviews. OU 2 involved the containment of the landfill and contaminated groundwater. OU 3 addressed contamination found in the groundwater outside of the containment system. The OU 4 remedy called for no further action in combination with long-term monitoring of the PCB-contaminated sediments in White and Wine Creeks. Although the PCB monitoring results are discussed in this five-year review, the OU 4 remedy is not subject to five-year reviews.

II. Site Chronology

Table 1 (attached) summarizes the significant site-related events from discovery to the present.

III. Background

Physical Characteristics

The PAS site, located on 15 acres within the eastern city limits of the City of Oswego, New York, is bounded on the south by East Seneca Street and on the east, north, and west by wetlands formed along the stream channels of White and Wine Creeks. Just to the north (downstream) of the site is the confluence of White and Wine Creeks. Wine Creek flows approximately 1,800 feet beyond the confluence (northward) to a channel and into Lake Ontario. Just east of this channel is a wetland, which is located next to a residential area known as Smith's Beach.

The fenced site is grass-covered. The only structure on the site is a 44,000-gallon concrete leachate collection tank which is protected by a shed.

Site Geology/Hydrogeology

The PAS site is located in the eastern section of the Lake Ontario physiographic province. The geology consists of glacially-derived sediments ranging from till and lacustrine silt and clays to stratified sands and gravels. These sediments overlay the Oswego Sandstone. In general, two aquifer systems exist in the region. Although the bedrock and overburden aquifer systems generally exhibit regional groundwater flow north toward Lake Ontario, local groundwater flow in the vicinity of the site is north westward toward the Wine Creek wetlands.

Several stratigraphic units have been defined at the site. A surficial fill layer of variable depth and composition covers most of the site and consists primarily of demolition debris brought onto the site before the PAS facility was in operation. This fill layer is underlain by a glacial till that varies in thickness from 15 feet to approximately 35 feet at the site. The exception to this is in an area outside the slurry wall and in the vicinity of White Creek, where fill is underlain by stratified sediments. A continuous dense till layer is purported to overlie the bedrock across the site and is reportedly thickest (about 35 feet) in the southwestern portion of the site. Bedrock is located approximately 50 feet below the ground surface near the center of the site. Two aquifer systems exist on-site, an unconfined overburden aquifer and a bedrock aquifer. The local groundwater flow direction in the vicinity of the site is toward the northwest in the direction of the Wine Creek's wetlands.

Land and Resource Use

The PAS property is zoned for industrial use. The area between the PAS site and Lake Ontario (to the north) is mostly undeveloped, and currently includes multiple land uses, including a cemetery, a wetland, and commercial and residential areas.

Both White and Wine Creeks are used by a wide variety of wildlife, including avian and fish species, the latter utilizing the streams for spawning. The lower reach of Wine Creek, near Lake Ontario, is used for seasonal recreational fishing.

Groundwater is classified as GA (drinking water source). However, residents within the Oswego City limits receive public water, and establishment of residential water supply wells within the contaminated area and City limits is prohibited by law.

To prevent the utilization of the groundwater underlying the site, to prevent development of the site for residential use, and to allow access for maintenance and monitoring activities, a permanent easement was acquired by NYSDEC.

History of Contamination

The PAS facility, a high-temperature, liquid chemical waste, incineration facility, operated from 1970 through 1977. Throughout its operational life, the facility experienced continuous operating problems, numerous air and water quality violations, and mounting public opposition. Because the

incinerator never operated properly, thousands of drums containing various chemical wastes accumulated on-site and tank loads of liquid waste were stored in on-site lagoons.

Initial Response

Beginning in 1973, a series of incidents, including liquid waste spills and the overflow of liquid wastes from lagoons into White Creek, led to the involvement of EPA and NYSDEC at the site. Response actions taken from 1973 to 1982 by EPA, NYSDEC, and the Coast Guard resulted in an oil spill cleanup, the removal of the incineration facilities, drummed wastes, bulk liquid wastes, and contaminated soils, and the closure of two on-site lagoons.

In 1981, the PAS site, which was ranked number seven on the original National Priorities List (NPL), was selected as one of the first sites in the nation to receive CERCLA Trust Fund monies for cleanup actions.

Basis for Taking Action

From 1982 to 1984, NYSDEC performed a *Site Investigation and Remedial Alternatives Evaluation* of the PAS site, which was the initial remedial investigation/feasibility study (RI/FS) conducted at the site. The analytical data generated during the RI showed extensive and significant organic and inorganic soil and groundwater contamination on-site. In addition, contaminated surface water and groundwater were found to be migrating off-site.

The risk assessment summary presented in the 1993 ROD identified benzene, vinyl chloride, and metals as contaminants of concern (COCs) in the groundwater. The associated cancer risks and noncancer hazards from the ingestion of groundwater, by adults and children, as a drinking water source exceeded the risk range.

PCBs are the COC in the sediments in White and Wine Creeks and the adjacent wetlands. The human health risk assessment presented in the 1997 ROD found cancer risks and noncancer hazards to adults and children from sediment ingestion and dermal contact were within the risk range. The ecological risk assessment found the levels of PCBs present in the sediments in the depositional areas of White Creek may pose an unacceptable risk to ecological receptors (green backed heron and mink) that may use the creek and adjacent wetlands as foraging areas. The ROD noted that there are several potential current sources of PCB contamination located upstream of the PAS site.

IV. Remedial Actions

Remedy Selection and Implementation

Based on the results of the RI/FS, EPA signed a ROD in 1984, which called for limited excavation and off-site disposal of contaminated materials, installation of a perimeter slurry wall, site grading

and capping in accordance with Resource Conservation and Recovery Act (RCRA) requirements, installation of a leachate collection and treatment system, and groundwater monitoring. The remedial action objective (RAO) for this ROD was to reduce and minimize the downgradient migration of contaminants in the groundwater and to minimize any potential human health and ecological impacts resulting from the exposure to contaminants at and downgradient from the site. NYSDEC implemented the remedial actions identified in the ROD, with the exception of the on-site treatment system. Rather than installing an on-site treatment system, NYSDEC collected the leachate from 1986 through 1991 and transported it off-site to an approved RCRA treatment/disposal facility.

In September 1991, EPA and a group of potentially responsible parties (PRPs) entered into an Interim Groundwater Removal (IGR) Administrative Order on Consent (AOC). This IGR AOC required the routine removal of leachate from within the containment system. The IGR AOC was extended by a second AOC entered into in 1994. The extracted leachate (approximately 10,000 gallons per month) is currently transported to an approved RCRA treatment/disposal facility.

From 1984 to 1986, NYSDEC performed an environmental assessment of the area in the vicinity of the PAS site, which included White and Wine Creeks. Based on the results of the environmental assessment, NYSDEC determined that no remediation of the creeks was required.

The long-term monitoring program, which was commenced in 1989 by NYSDEC, includes routine monitoring of the groundwater and sediments in the vicinity of the PAS site. Results from soil gas and groundwater sampling, and down-hole camera investigations of the existing monitoring wells at the site, conducted between 1987 and 1990, indicated the presence of volatile organic compounds (VOCs) in the groundwater outside the slurry wall containment system.

Because groundwater contamination continued to be detected outside the containment system, in September 1990, an AOC was entered into between EPA and a group of PRPs to conduct a supplemental RI/FS to evaluate the integrity of the existing containment system; to determine the nature, extent, and source of the contamination; to identify any threat to the public health or the environment caused by the release of hazardous substances outside the containment system; and to identify and evaluate remedial alternatives. The supplemental RI report, issued in 1993, concluded that the contamination that was detected in the bedrock groundwater outside the containment system was attributable to the downward migration of contaminants through the lodgement till beneath the containment system, particularly in an area where the lodgement till is relatively thin. The supplemental RI report also noted that the highest level of contaminants occurred in the vicinity of a leachate collection well where downward hydraulic gradients existed prior to implementation of the IGR program. The study concluded that the IGR program effectively reversed these downward hydraulic gradients and mitigated releases from this source.

Based upon the results of the supplemental RI/FS, EPA signed a ROD on December 29, 1993. The 1993 ROD incorporated all of the existing components of the 1984 ROD, as well as, several additional items. The selected remedy included enhancing the source control system by optimizing the leachate extraction rate and other operating parameters in order to achieve, to the degree

practicable, inward horizontal gradients in the overburden and upward vertical gradients from the bedrock toward the containment system; off-site treatment of the extracted leachate; connecting downgradient residents in the Smith's Beach area who were using residential wells to the public water supply to ensure that potential future exposure to contaminants in the bedrock groundwater does not occur; and institutional controls on groundwater usage at and downgradient from the site. The RAOs of this ROD were to prevent potential future exposures to contaminated groundwater on-site, as well as off-site in the area between the site and Smith's Beach; restore groundwater quality to levels consistent with federal and state groundwater quality and drinking water standards; and, mitigate the off-site migration of contaminated groundwater.

In addition, the 1993 ROD identified discharging the extracted leachate and contaminated groundwater to the City of Oswego's Eastside Wastewater Treatment Plant as the preferred treatment and disposal option, with the construction of an on-site treatment system with discharge to White or Wine Creek or to groundwater as a contingent option, should the preferred treatment and disposal option be determined not to be feasible. The 1993 ROD also stated that the current method for handling the extracted leachate and groundwater via an off-site treatment facility would continue until a final treatment option is selected and implemented.

The 1993 ROD also called for several investigations related to the enhancement of the source control system. In addition, since there was some uncertainty related to the source of the PCB contamination detected in the sediments in the adjacent wetlands and White and Wine Creeks, and the source of pesticides detected in the surface water of Wine Creek, the ROD called for a study to determine the sources of PCB and pesticide contamination.

In July 1994, an AOC was entered into by EPA and a group of PRPs to conduct a supplemental pre-remedial design study (SPRDS) related to the investigations called for in the 1993 ROD. In September 1994, an AOC between EPA and a group of PRPs was entered into to extend the routine leachate removal called for in the IGR AOC, and, among other things, to connect residents in the Smith's Beach area, who were using residential wells, to the public water supply as an added measure of protection. These residential connections to the public water supply were subsequently completed in 1995. The SPRDS, which was completed in 1996, concluded that the bedrock groundwater downgradient of the containment system flows northwest, rather than north toward the Smith's Beach area as was previously believed.

In September 1996, an Explanation of Significant Differences (ESD) was issued. The ESD explained the results of the additional investigations called for in the 1993 ROD and modified the contingent remedy for the treatment of the leachate to provide for continued off-site treatment and disposal. The 1996 ESD also required that a focused feasibility study (FFS) be conducted to evaluate remedial alternatives for the PCB-impacted sediments in the creeks and wetlands adjacent to the site.

Based upon data collected between 1991 and 1996 that suggested that PCB sediment concentrations were decreasing (presumably due to the deposition of clean sediments, and/or the downstream migration and subsequent dilution of contaminated sediments) and the evaluation of remedial

alternatives in the FFS, a ROD was signed on September 30, 1997. This ROD called for no further action with long-term PCB monitoring. The RAO of this ROD was to minimize exposure of fish and wildlife to PCB-contaminated sediment in White Creek and adjacent wetlands, and the cleanup goal for PCBs in the sediments is 1 milligram per kilogram (mg/kg).

Consent Decrees to carry out the remedy called for in the 1993 ROD as modified by the ESD and the long-term monitoring called for in the 1997 ROD were entered by the Court in 1998 and 1999, respectively.

Institutional Controls Implementation

The 1993 ROD recommended institutional controls on groundwater usage through deed restrictions at the PAS site and downgradient from the site to and including the Smith's Beach area.

To prevent the utilization of the groundwater underlying the site proper, to prevent the development of the site for residential use, and to allow access for maintenance and monitoring activities, a permanent easement was acquired by NYSDEC. All of the residential properties located in the vicinity of the site are within the City limits, where the installation of wells is prohibited pursuant to Section 602.3 of the New York State Plumbing Code. There are two industrial properties located downgradient of the site. To prevent exposures to contaminated groundwater at these properties, through the PRPs' efforts, Environmental Protection Easement and Declaration of Restrictive Covenants were recorded by the County Clerk on August 6, 2004 and March 1, 2006. New York State requires annual certification that institutional controls that are required by the RODs are in place and that remedy-related operation, maintenance, and monitoring (OM&M) is being performed. This certification is included as an attachment in the *Annual OM&M Progress Reports*.

System Operations/Operation and Maintenance

The primary objectives of the 1984 and 1993 RODs were to control the source of contamination at the site, reduce and minimize the downgradient migration of contaminants in the groundwater, and minimize any potential human health and ecological impacts resulting from exposure to contamination at the site. This was effected by, among other things, the installation of a perimeter slurry wall and RCRA cap over the waste disposal area, leachate collection and treatment, and institutional controls. To ensure that the implemented remedy remains effective, a long-term monitoring program was designed with the goal of restoring the aquifer.

The slurry wall containment system includes a bentonite-clay slurry wall keyed into the underlying lodgement till; a cap, consisting of a synthetic liner, clay, and vegetated soils; and a leachate collection system. The leachate collection system, which is used for collection and removal of leachate that accumulates within the containment system, consists of collection drains (gravel-filled trenches), four collection wells, a network of polyvinyl chloride force mains, submersible pumps with controls, and a leachate collection tank.

Leachate is collected within the containment system in two trench systems: a downgradient perimeter trench located inside the slurry wall at the northern boundary of the site and a cross-trench located near the center of the site. Three 14-inch-diameter leachate collection wells (LCW-1, LCW-2, and LCW-3) equipped with submersible pumps and controls are used to remove leachate collected in the downgradient perimeter trench. A fourth pumping well (LCW-4) is used to remove leachate collected in the cross-trench at the center of the containment area. Accumulated leachate is pumped into 2-inch-diameter PVC force mains that discharge into a 44,000-gallon concrete leachate collection tank (see Figure 1).

Leachate removal activities are being conducted monthly under the September 1997 Consent Decree. The PRPs' IGR program was conducted initially by Blasland, Bouck & Lee Environmental Services. Subsequently, the work was performed by O'Brien & Gere. Now, it is performed by ARCADIS. Under the IGR program, about 10,000 gallons of leachate is extracted monthly from within the containment system. Leachate removed from the site under the IGR program was previously transported to DuPont in Deepwater NJ (1992 – 1996), CECOS in Niagara Falls, NY (1996 – 2005), and Clean Harbors in Baltimore, MD and Bristol, CT (2005 – 2007) for treatment and disposal. It is now pretreated and transported to the City of Auburn Publicly Owned Treatment Works Facility, located in Auburn, NY.

Horizontal water-level gradients across the slurry wall are routinely measured at six well pairs. The original leachate removal protocol stated that if water-level elevations collected two weeks after the primary leachate removal event indicate that an additional 10,000 gallons of leachate has accumulated, then a contingency removal event is to be scheduled. In an effort to streamline and improve the efficiency of the operational monitoring activities at the site, in 2003, EPA decided to eliminate the contingency removal event protocol from the OM&M program since monitoring results indicated that the contingency removal events were not necessary to maintain hydraulic control within containment system. This modification was made with the provision that if during any future monthly leachate removal event more than 15,000 gallons of leachate is available for removal, then the contingency removal event may be reinstated.

As of June 2008, 3,179,956 gallons of leachate have been removed from the containment system.

Monitoring activities at the site include groundwater elevation measurements at selected locations in the vicinity of the containment system, and leachate quality monitoring from specified locations within the containment system. Long-term monitoring currently consists of the semiannual (May and November) sampling of three groundwater wells located at and downgradient of the site. Stream sediment monitoring for VOCs was performed until 2000. It was discontinued because there were no detections of VOCs at any of the three sediment locations for two consecutive years. Biota and sediment monitoring for PCBs in the wetlands and creeks continue on an annual basis.

Routine maintenance at the site includes mowing the vegetated cap and maintaining the leachate collection system, perimeter fence, and access road.

New York State requires annual certification that institutional controls required by RODs are in place and that remedy-related OM&M is being performed. This certification is included as an attachment in the *Annual OM&M Progress Reports*.

The annual OM&M costs are approximately $245,000; these costs are broken down in Table 2 (attached).

V. Progress Since the Last Five-Year Report

The second five-year review for the site was conducted in December 2003 pursuant to OSWER Directive 9355.7-03B-P. The 2003 review found that the remedies were protective of human health and the environment. While there were no recommendations or follow-up actions associated with the previous review, the PRPs completed an *Institutional Control Implementation Plan* for the site in June 2004, which resulted in the County Clerk's August 2004 and March 2006 recording of Environmental Protection Easement and Declaration of Restrictive Covenants for two downgradient properties. In addition, since the last five-year review, nine monitoring wells were decommissioned, including two of the five wells that had been included in the groundwater sampling program. At EPA's request, groundwater samples were collected from three additional monitoring wells in 2006, and in 2007. Also, several additional wells were added to the groundwater level measurement network.

VI. Five-Year Review Process

Administrative Components

EPA's five-year review team consisted of Patricia Simmons Pierre (RPM), Marian Olsen (Risk Assessor), Mindy Pensak (Biological Technical Assistance Group Coordinator), and Michael Scorca (Hydrogeologist).

Community Involvement

The EPA Community Involvement Coordinator (CIC) for the PAS site, Michael Basile, published a notice in the *Oswego Palladium Times,* a local newspaper, on September 12, 2008, notifying the community of the initiation of the five-year review process. The notice indicated that EPA would be conducting a five-year review to ensure that the remedies implemented at the site remain protective of public health and are functioning as designed. It was also indicated that once the five-year review is completed, the results will be made available in the local site repositories. In addition, the notice included the RPM's and the CIC's addresses and telephone numbers for questions related to the five-year review process or the PAS site. No comments were received.

Documents Review

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

Data Review

A review of the long-term leachate quality data indicates an overall stable trend in total VOC concentrations since remedy implementation, with some variability that could be related to seasonality. Leachate samples are collected from two leachate extraction wells—LCW-2, which is located in the center of the perimeter trench, and LCW-4, which is located in the cross-trench at the center of the containment area. Total VOC concentrations over the last five years at LCW-2 ranged from 60 micrograms per liter (µg/l) to 1,677 µg/l. Total VOCs at LCW-4 during the review period fluctuated between a low of 1,051 µg/l to a high of 5,699 µg/l.

Long-term monitoring ground water samples are collected from three wells: M-21; LR-8; and LR-6 (see Figure 1). The VOC (benzene, chlorobenzene, 1, 1-dichloroethane, ethylbenzene, toluene, and xylene) concentrations in bedrock monitoring well M-21, located approximately 250 feet downgradient from the site, have remained relatively low over the last five years. At present, only chlorobenzene has exhibited a noticeable recent increase (it was 7.83 µg/l and 7.13 µg/l in May 2007 and May 2008, respectively, which are slightly above the 5 µg/l Maximum Contaminant Level (MCL)). During the five-year period, benzene was present once above the MCL (5 µg/l) in May 2004 at 5.5 µg/l. In May 2008, it was 0.68 µg/l.

During the review period, the chlorobenzene concentrations in monitoring well LR-8, located approximately 125 feet downgradient from the site, have fluctuated between a low of not detected to a high of 14.6 µg/l in November 2007. Benzene, the only other VOC above the MCL in this well, has ranged during the past five years from not detected to a high of 21 µg/l in November 2007. In monitoring well LR-6 (located immediately outside the slurry wall to the northwest), 1,1-dichloroethane has been the only VOC detected above MCLs since long-term monitoring began. Since May 2000, the concentrations of 1,1- dichloroethane have all been below the MCL of 5 µg/l.

Horizontal water-level gradients across the slurry wall are measured at six well pairs. Well pair SWW1/SWW2 is located on the upgradient side of the containment system and always shows inward water-level gradients, with a head difference of about 7 feet. Well pair SWW3/SWW4 is on the northeastern side of the capped area. During the latter part of the review period, this well pair has demonstrated outward water level gradients more than 50% of the time (14 of 22 measurements from November 2006 to August 2008). Well pair SWW5/SWW6 is located at the north corner of the containment system. During the latter part of the review period, this well pair has demonstrated outward water-level gradients more than 50% of the time (14 of 22 measurements from November 2006 to August 2008. Well pair SWW7/SWW8 is located on the southwest side of the containment system and usually showed inward water-level gradients, except for four measurements (August 2007 to November 2007). In addition, the water levels in the well outside the wall rise above the

level of the top of the slurry wall. Well pair SWW9/SWW10 is on the west side of the capped area and demonstrates outward water-level gradients about half the time (11 of 22 measurements from November 2006 to August 2008). Well pair SWW11/SWW12 is at the northwest corner of the capped area and showed an outward-directed water-level gradient, which varied in magnitude, through all of November 2006 to August 2008.

Leachate removal events are currently conducted at the site once per month, with approximately 10,000 gallons of leachate being removed during each event. The original leachate removal protocol stated that if water-level elevations collected two weeks after the primary leachate removal event indicate that an additional 10,000 gallons of leachate has accumulated, then a contingency removal event is to be scheduled. Since monitoring results indicated that the contingency removal events were not necessary to maintain hydraulic control within containment system, in an effort to streamline and improve the efficiency of the operational monitoring activities at the site, EPA decided to eliminate the contingency removal event protocol from the OM&M program in 2003. This modification was made with the provision that if during any future monthly leachate removal event more than 15,000 gallons of leachate is available for removal, then the contingency removal event may be reinstated. Based upon the outward hydraulic gradients observed at several of the well pairs during this review period, it may be necessary to reinstate the contingency removal event protocol in the OM&M program.

A review of the *Annual PCB Long-Term Monitoring Progress Reports* from 2004 through 2008 indicates that PCB concentrations in sediment and fish tissue remain relatively low. In general, during the review period, the concentrations of PCBs in the sediment traps ranged from 0.09 to 5.7 mg/kg, with 60% of the concentrations at or below 1 mg/kg, and the concentrations of PCBs in fish tissue ranged from 0.21 to 2.19 mg/kg, with the 65% of the concentrations at 1 mg/kg or below.

Site Inspection

A site visit related to this five-year review was conducted on June 7, 2008 by Patricia Simmons Pierre and Marian Olsen of EPA. The EPA representatives were accompanied by Clay McClarnon of de maximis, inc. and David Rigg of ARCADIS on behalf of the PRPs. No issues arose during the site visit.

Interviews

Clay McClarnon, of de maximis, inc. and David Rigg were interviewed in relation to this five-year review. Both indicated that the remedies are functioning as anticipated.

Institutional Controls Verification

The law which prevents the drilling of wells within the city limits remains in effect. Likewise, the permanent easement is still on file at NYSDEC's office and in effect and the Environmental Protection Easement and Declaration of Restrictive Covenants are still on file in the County Clerk's

office and in effect. New York State requires annual certification that institutional controls required by RODs are in place and that remedy-related OM&M is being performed. This certification is included as an attachment in the *Annual OM&M Progress Reports*.

Other Comments on Operation, Maintenance, Monitoring, and Institutional Controls

There are no comments or suggestions.

VI. Technical Assessment

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

Yes. The primary objectives of the 1984 ROD and the 1993 ROD, as modified by the ESD, are to control the source of contamination at the site; to reduce and minimize the downgradient migration of contaminants in the groundwater; and, to minimize any potential human health and ecological impacts resulting from the exposure to contaminants at and downgradient from the site. Although the average monthly volume of leachate removed from the containment system has been fairly steady over the past few years, four of the six well pairs across the slurry wall have shown a shift from inward to outward gradients for more than half of the time (for the period from November 2006 to August 2008). While sample results from downgradient monitoring wells show fairly low concentrations of contaminants, hydraulic gradients are directed outward more than half the time at 4 of the 6 well pairs that monitor the slurry wall. This is likely due to changes in regional hydrologic conditions, which generally show seasonal water-level declines during summer months. Additional removal of leachate is probably necessary to ensure that an inward and upward hydraulic gradient is maintained and further migration of contaminants is prevented.

The 1997 ROD called for no further remedial action, with long-term monitoring of the sediments and biota in the creeks and wetlands adjacent to the site. A review of the *Annual PCB Long-Term Monitoring Progress Reports* over the past five years indicates that the PCB levels in the sediments are generally decreasing, and are frequently below detection levels at some locations. The concentrations of PCBs in sediments and fish tissue in White and Wine Creeks are generally continuing to decrease, as well.

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

Yes. The property is zoned industrial and there have been no changes in the physical conditions of the site that would affect the protectiveness of the remedy. The groundwater containment system, RCRA cap, fence, and institutional controls identified above remain barriers to direct exposure to on-site contaminants.

Soil and groundwater uses at the site are not expected to change during the next five years. The land use considerations and potential exposure pathways considered in the baseline human health risk assessment are still valid. The MCLs, state MCLs (NYCRR, Title 10, Part 5-1) and New York State Groundwater Quality Standards (NYCRR, Title 6, Parts 701-703) identified in the 1993 ROD as remedial goals remain protective. Therefore, the remedy remains protective for this exposure pathway. The groundwater risks identified in the 1993 ROD focused on potential use of the aquifer as a potable or drinking water source by residents and workers. Residents in the area receive public water, and establishment of residential water supply wells within the contaminated area and City limits is prohibited by law. In addition, Environmental Easements were established for two downgradient properties to prevent the installation of wells. At the current time, exposure through consumption of groundwater at the site and at the downgradient property, is not a completed exposure pathway. The concentrations of PCBs in fish tissue ranged from 0.21 mg/kg (in 2005) to 2.19 mg/kg (in 2008), with 65% of the concentrations at 1.00 mg/kg. The 1998 Five-Year Review Report identified two additional potential sources of PCBs in the sediments in the wetlands and creeks in the vicinity of the PAS site—the East Seneca Street Dump and the Niagara Mohawk Fire Training School. The State of New York is responsible for overseeing activities at these non-NPL sites.

Vapor intrusion is a potential exposure pathway associated with building residential/commercial buildings above the groundwater plume. Vapor intrusion was evaluated in the previous five-year review and it was concluded that the maximum concentrations in the groundwater did not exceed vapor intrusion comparison values at a Hazard Index of 1 or a cancer risk = 10^{-4} (or one additional cancers in a population of 10,000). Evaluation of vapor intrusion associated with other long-term monitoring wells at the site was not evaluated since residential/commercial buildings are not located on the site and the existence of the landfill cap will limit the future development of this property. Therefore, this is not considered a completed pathway at the present time. In the unlikely event that buildings were to be built on-site, further evaluation of this pathway may be necessary. This further evaluation may include site-specific considerations, such as the type of building, the location of the building relative to the maximum detected concentrations, and the subsurface characteristics at the site.

The selected remedy for the soils was designed to reduce the risk to human health and the environment due to contaminants leaching from the landfill. As such specific Applicable or Relevant and Appropriate Requirements (ARARs) were not established for the soils at the site although the landfill cap, designed in 1984, was constructed under RCRA requirements. The groundwater ARARs established in the 1993 ROD included MCLs and non-zero Maximum Contaminant Level Goals established under the Safe Drinking Water Act, for drinking water sources and these values remain valid. Other state ARARs identified in the ROD were the 10 NYCRR Part 5-1, and 6 NYCRR Part 701 to 703 standards. All standards remain valid.

The goals of the sediment remediation were to minimize exposure of fish and wildlife to PCB-contaminated sediments in White Creek and adjacent wetlands. A concentration of 1 mg/kg was identified in the 1997 ROD as a remediation goal based on the NYSDEC's Technical Guidance for

Screening Contaminated Sediment. PCB concentrations in sediment and fish tissue remain relatively low and do not pose a risk to upper trophic level receptors (mink and green heron). From a human health perspective, the concentration of 1 mg/kg PCBs is protective for direct contact with the sediments (ingestion and dermal contact) under residential exposures.

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

No. There is no information that calls into question the protectiveness of the selected remedies.

Technical Assessment Summary

Based upon the results of the five-year review, it has been concluded that:

- The leachate monitoring/collection system is operating properly;
- The cap and vegetative cover are intact and in good condition;
- The fence around the site is intact and in good repair;
- The groundwater long-term monitoring wells are functional;
- There is no evidence of trespassing, vandalism or damage (to the cap and vegetative cover, long-term monitoring wells, or fence);
- Long-term leachate-quality data indicates an overall stable trend in total VOC concentrations (with possible seasonal variability) since remedy implementation;
- VOC concentrations in monitoring wells M-21 and LR-8 (located south of Mitchell Street) have remained relatively low over the past five years, but remain above MCLs;
- VOC concentrations in monitoring well LR-6 (located immediately outside the containment system to the northwest) are below MCLs;
- PCB levels in creek and wetland sediments and biota remain relatively low and do not pose a risk to human health or upper trophic level receptors (mink and green heron);
- There are no drinking water wells within the plume of contamination and none are expected to be drilled because of existing local requirements;
- Wetlands and surface waters are not degraded by site contaminants, and site remedies are expected to be in place so as to prevent contaminants from reaching and contaminating wetlands and surface waters;

- Four of the six well pairs across the slurry wall have shown a shift from inward to outward gradients for more than half of the time (for the period from November 2006 to August 2008); and

- In order to more effectively maintain hydraulic control of the containment system, the monthly leachate contingency removal event protocol should be reinstated.

VII. Recommendations and Follow-Up Actions

In order for the site to be protective in the long-term, hydraulic control within the containment system should be consistently maintained. The monthly leachate contingency removal event protocol should be reinstated in order to more effectively maintain hydraulic control of the containment system, see Table 5 (attached).

VIII. Protectiveness Statement

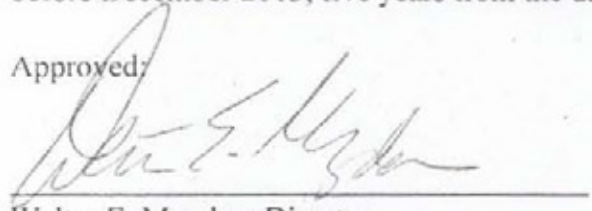
The implemented containment remedies for OU 2 and OU 3 are protective of human health and the environment in the short-term. Currently there are no exposure pathways that could result in unacceptable risks and none are expected, as long as engineering and institutional controls are properly maintained and all residents are connected to public water. In order for the site to be protective in the long-term, hydraulic control within the containment system should be consistently maintained. Aquifer restoration is contingent upon proper maintenance of the hydraulic control within the containment system.

The site-wide remedial actions protect human health and the environment in the short-term. 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 implemented engineering and institutional controls are properly monitored and maintained. In order for the site to be protective in the long-term, hydraulic control within the containment system should be consistently maintained.

IX. Next Review

The next five-year review for the Pollution Abatement Services Superfund site should be completed before December 2013, five years from the date of this review.

Approved:



12/19/2008

Walter E. Mugdan, Director
Emergency and Remedial Response Division

Date

Figure 1: Site Plan Pollution Abatement Services Site

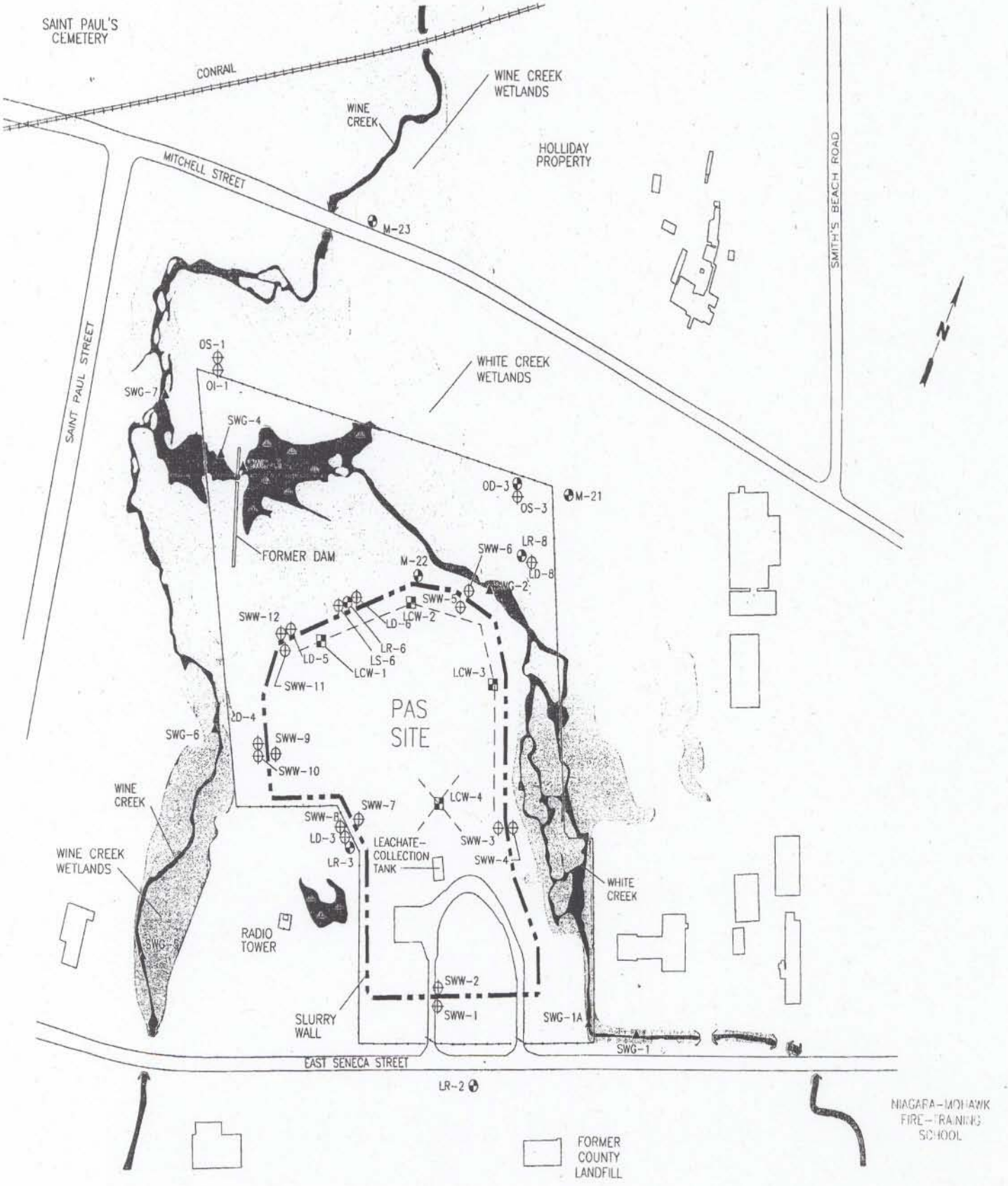


Table 1: Chronology of Site Events	
Event	**Date**
Remedial response actions taken by EPA, NYSDEC, and the Coast Guard	1973 -1982
PAS site selected as one of the first sites in the nation to receive CERCLA Trust Fund monies for cleanup actions	1981
Site Investigation and Remedial Alternatives Evaluation (initial remedial investigation/feasibility study for the site) conducted by NYSDEC	1982 - 1984
PAS site listed on the NPL	1983
Record of Decision (ROD) calling for, among other things, the installation of a perimeter slurry wall and RCRA cap, and the construction of an on-site groundwater (leachate) treatment system signed by EPA	1984
Environmental assessment of area in the vicinity of the site including White and Wine Creeks conducted by NYSDEC	1984 - 1986
NYSDEC implemented the remedial actions identified in the 1984 ROD with the exception of the construction of the on-site treatment system	1986
NYSDEC collected leachate and transported it off-site to an approved RCRA treatment/disposal facility	1986 - 1991
Supplemental RI/FS to evaluate the integrity of the existing containment system at the site, conducted by PRPs	1990 -1993
Administrative Order on Consent (AOC) for leachate collection and off-site disposal signed by EPA and PRPs	1991
ROD calling for, among other things, the enhancement of the present source control system and several investigations related to the enhancement of the source control system signed by EPA	1993
1991 AOC extended by a second AOC	1994
Supplemental Pre-Remedial Design Study, related to the investigations called for in the 1993 ROD, conducted by PRPs	1994 -1996
Explanation of Significant Differences explaining the results of the additional investigations called for in the 1993 ROD and providing for the continued off-site treatment and disposal of leachate, issued by EPA	1996
Focused Feasibility Study related to the PCB-impacted sediments in White and Wine Creeks conducted by PRPs	1996
Consent Decree for the performance of the remaining components of the 1993 signed by EPA and PRPs	1997
ROD calling for no further action with long-term monitoring of the PCB-impacted sediments in the vicinity of the site signed by EPA	1997
Consent Decree for the implementation of long-term monitoring program called for in the 1997 ROD signed by EPA and PRPs	1998
First Five-Year Review conducted by EPA	1998
Second Five-Year Review conducted by EPA	2003

Table 2: Annual Maintenance, Monitoring, and Disposal Costs	
Estimated Costs	**Annual Cost**
Monitoring and Maintenance	$85,000
Leachate Removal and Disposal	$160,000
Total Estimated Cost	**$245,000**

Table 3: Documents, Data, and Information Reviewed
Record of Decision, EPA, June 1984
Record of Decision, EPA, December 1993
Record of Decision, EPA, September 1997
Consent Decree, United States v. Agway, Inc., et al, Civil Action No. 98-CV-0112, September 1997
Operation, Maintenance, and Long-Term Monitoring Plan, BBL Environmental Services August 1998
Consent Decree, United States v. General Motors Corporation and Niagara Mohawk Power Corporation, Civil Action No. 98-CV-1927, December 1998
PCB Long-Term Monitoring Plan, Blasland, Bouck & Lee, August 1999
Five-Year Review Report, EPA, December 29, 2003
Annual Operation, Maintenance, and Monitoring Progress Reports, de maximis, inc., 2003 to 2008
Annual PCB Long-Term Monitoring Progress Reports, Blasland, Bouck & Lee, Inc. and ARCADIS, 2004 to 2008
Draft Five-Year Data Review Report, de maximis, inc., November 2008
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 ROD

Table 4: Recommendations and Follow-Up Actions						
Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness (Y/N)	
					Current	Future
Four of the six well pairs across the slurry wall have shown a shift from inward to outward gradients for more than half of the time (for the period from November 2006 to August 2008).	In order to more effectively maintain hydraulic control of the containment system, the monthly leachate contingency removal event protocol should be reinstated.	PRP	EPA	01/31/2009	N	Y

Table 5: Acronyms Used in this Document	
AOC	Administrative Order on Consent
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CIC	Community Involvement Coordinator
EPA	United States Environmental Protection Agency
ESD	Explanation of Significant Differences
FFS	Focused Feasibility Study
IGR	Interim Groundwater Removal
LCW	Leachate Collection Well
µg/l	Micrograms per Liter
mg/kg	Milligrams per Kilogram
NPL	National Priorities List
NYSDEC	New York State Department of Environmental Protection
OM&M	Operation, Maintenance, and Monitoring
PAS	Pollution Abatement Services
PCB	Polychlorinated Biphenyl
PRP	Potentially Responsible Party
PSD	Performing Settling Defendants
RA	Remedial Action
RCRA	Resource Recovery and Conservation Act
RD	Remedial Design
ROD	Record of Decision
RPM	Remedial Project Manager
SPRDS	Supplemental Pre-Remedial Design Study
VOC	Volatile Organic Compound