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ENVIRONMENT

Subject:

Pollution Abatement Services Superfund Site – Fourth Operable Unit  
Oswego, New York  
Annual Progress Report - 2016

Date:  
February 22, 2017

Contact:  
Jason C. Vogel

Dear Ms. Simmons-Pierre:

On behalf of National Grid, please find enclosed the Annual Progress Report which describes the activities performed during 2016 in connection with the fourth operable unit (OU4) at the Pollution Abatement Services (PAS) Superfund Site located in Oswego, New York.

Phone:  
315.671.9134

Email:  
jason.vogel@arcadis.com

The report has been prepared in accordance with the requirements outlined in Section X of the Consent Decree for OU4 between the USEPA and the Settling Defendants (National Grid and General Motors) lodged by the Court on December 15, 1998. Please note that the Settling Defendants originally included National Grid and GM. As indicated previously, GM filed for bankruptcy in 2009.

Our ref:  
B0036444.2016

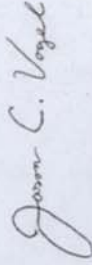
As stated in the Annual Progress Report, monitoring was conducted in 2016, and will subsequently continue in two-year intervals (next sampling in 2018), until changed with USEPA concurrence. The monitoring includes sampling and analysis of sediments, sediment traps, and fish tissue. A copy of the data usability summary reports for the laboratory analysis is also included. A CD with the full laboratory data packages is also included.

Please feel free to call me at 315.671.9134 if you have any questions regarding the enclosed.

Ms. Patricia Simmons-Pierre  
February 22, 2017

Sincerely,

Arcadis of New York, Inc.



Jason C. Vogel  
Senior Ecologist

Copies:

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Enclosures:

**Attachments**

Annual Progress Report - Period Covered: January 1, 2016 - December 31, 2016



**Pollution Abatement Services Superfund Site**  
**Oswego, New York**  
**Fourth Operable Unit**

**Annual Progress Report**

**Period Covered: January 1, 2016 - December 31, 2016**

This document represents the 2016 Annual Progress Report for the fourth operable unit (OU4) at the Pollution Abatement Services (PAS) Superfund Site (the Site) located in Oswego, New York. This progress report has been prepared in accordance with the requirements set forth in Section X of the OU4 Consent Decree lodged by the Court on December 15, 1998 between the United States Environmental Protection Agency (USEPA), and National Grid and General Motors Corporation (the Settling Defendants). The activities conducted pursuant to the requirements of the OU4 Consent Decree for the year 2016 are summarized below.

In accordance with the requirements set forth in the OU4 Consent Decree and the September 1997 Record of Decision (ROD) for OU4 (USEPA, 1997), the August 1999 *PCB Long-Term Monitoring Plan* (Plan) was developed by Blasland, Bouck & Lee, Inc. (BBL) (BBL, 1999). BBL (currently Arcadis) is the USEPA-approved Supervising Contractor identified in the OU4 Consent Decree. The Plan provides a detailed description of the requirements, methods, and procedures for monitoring the polychlorinated biphenyl (PCB) levels in the sediments and fish in White Creek and Wine Creek. The Plan was approved by the USEPA in a July 22, 1999 letter (USEPA, 1999). The monitoring activities identified in the Plan include sampling of surficial sediments (0- to 3-inch), subsurface sediments (3- to 6-inch and 6- to 12-inch), suspended sediment (trap), and biota (fish). In the third Annual Progress Report (BBL, 2000), BBL proposed that subsurface sediment samples not be collected in the future, and that future long-term monitoring events include the continued collection of surficial sediment, sediment trap, and fish samples in accordance with the Plan. USEPA approved this modification to the Plan on May 30, 2001, as documented in BBL's May 31, 2001 letter to the USEPA (BBL, 2001).

On January 7, 2009, USEPA provided comments to the Arcadis (2008) *Annual PCB Long-Term Monitoring Report*. The comments recommended that rather than reducing the sampling frequency to once every three years (as was proposed in the Annual Report), that the monitoring be conducted once every two years for the next two rounds (i.e., sampling in 2010 and 2012).

On January 27, 2014, USEPA provided comments to the 2013 *PCB Long-Term Monitoring: 5-Year Review* (Arcadis, 2013) (July, 2013) prepared by Arcadis on behalf of National Grid in which Arcadis had recommended discontinuing surficial sediment and sediment trap sampling. Dropping the sediment and sediment trap sampling was recommended since sediment PCB concentrations for most locations were below the site cleanup value of 1 mg/kg. In their comment letter, USEPA agreed with discontinuing the sediment samples from all locations



except for Location 3 and all sediment trap locations except for Location 4 since these locations had shown PCB levels above 1 mg/kg in recent sampling events. As a result, starting with the 2014 monitoring activities, only one sediment and sediment trap sample was collected as part of the biennial monitoring.

#### **I. Actions Taken Toward Compliance with the Consent Decree**

During this 2016 reporting period, the fourteenth round of PCB monitoring activities was completed. The monitoring activities were conducted in accordance with the USEPA-approved Plan, as modified in 2001, 2009, and 2014. The monitoring activities included collecting a surficial sediment sample at one location, a sediment trap sample at one location, and fish samples at five locations in White Creek and Wine Creek. A description of the monitoring and a summary of the results are presented in Attachment 1. The references cited herein are also listed in Attachment 1.

#### **II. Analytical Results and Data Generated**

The analytical results/data that have been generated during this reporting period and, in association with the OU4 Consent Decree, are solely related to completing the monitoring identified in the Plan. As previously stated, the monitoring activities included sediment, sediment trap, and fish sampling. Laboratory analysis of sediment included PCBs and total organic carbon (TOC), and laboratory analysis of fish included PCBs and percent lipids. A summary of that data is presented in Attachment 1.

#### **III. Plans and Reports and other Deliverables Completed or Submitted**

The Annual Progress Report for 2015 was submitted to USEPA on March 25, 2015.

#### **IV. Planned Activities for 2017**

Based on the fourth Five-Year Data Review Report prepared by USEPA (2014), it was recommended that the monitoring continue to be conducted once every two years for the next three rounds (i.e., sampling in 2014, 2016, and 2018). Therefore, there are no activities planned for 2017.

#### **V. Delays Encountered or Anticipated**

No delays were encountered during 2016, and no delays are anticipated during 2017.

#### **VI. Modifications to Plans or Schedules**

There were no modifications to the Plan and/or associated schedules during 2016.

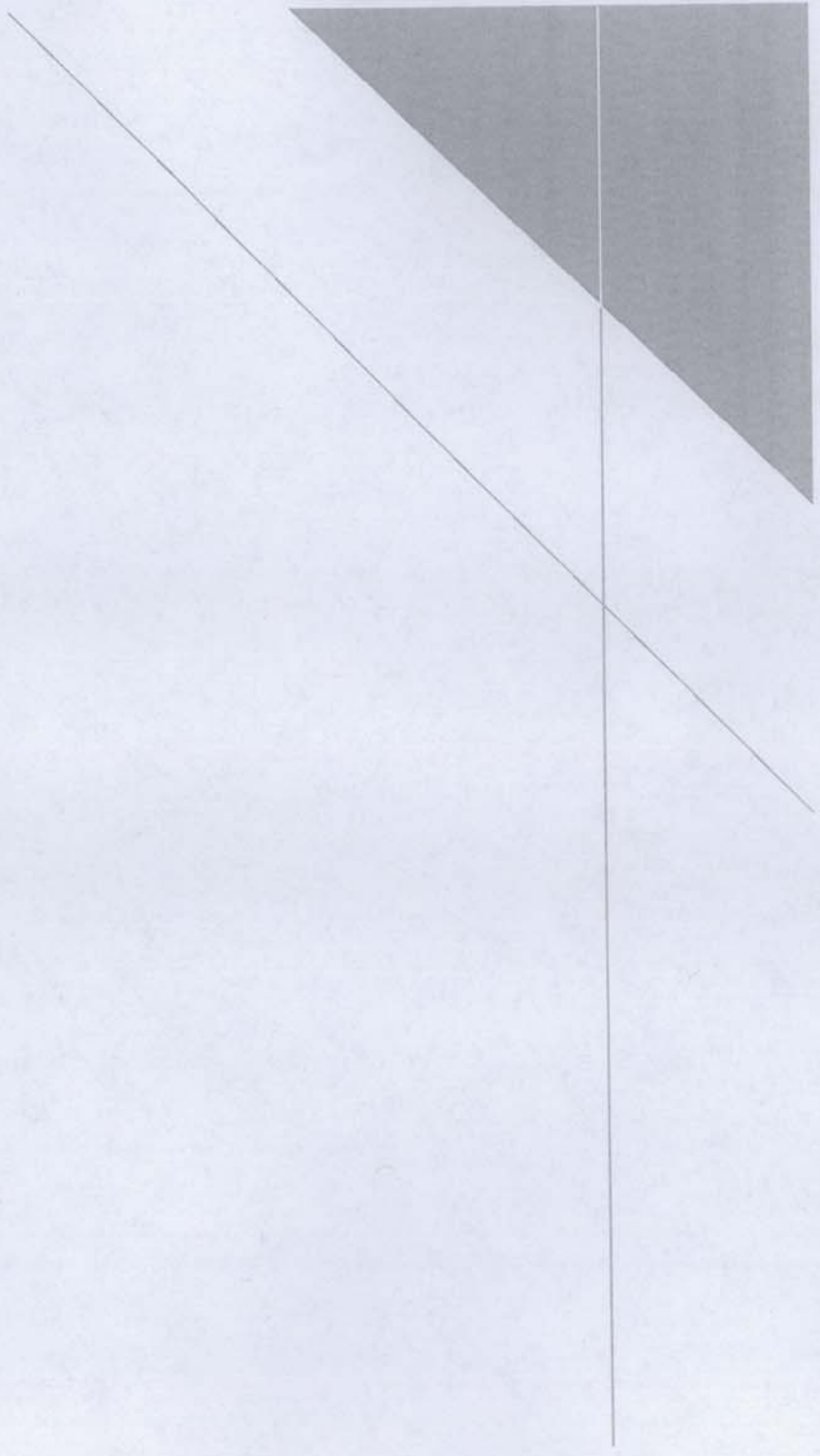
#### **VII. Actions Taken in Support of the Community Relations Plan**

In accordance with the requirements of the OU4 Consent Decree, the Settling Defendants will, upon notice by the USEPA, participate in the Community Relations Plan developed by the USEPA. To date, USEPA has not requested any participation by the Settling Defendants. Accordingly, no actions have been taken by the Settling Defendants in support of USEPA's Community Relations Plan.



# ATTACHMENT 1

Annual PCB Long-Term Monitoring Report (2016)



## Attachment 1

### ANNUAL PCB LONG-TERM MONITORING REPORT (2016)

#### *Pollution Abatement Services Superfund Site Oswego, New York Fourth Operable Unit*

#### 1. Introduction

This *Annual PCB Long-Term Monitoring Report (2016)* provides a summary of the polychlorinated biphenyl (PCB) data collected in 2016 at the Pollution Abatement Services (PAS) Superfund Site (the Site) located in Oswego, New York. This report describes the fourteenth year of monitoring data collected under the United States Environmental Protection Agency (USEPA)-approved *PCB Long-Term Monitoring Plan (Plan)* for the fourth operable unit (OU4) of the PAS Site [Blasland, Bouck & Lee, Inc. (BBL), 1999] and the USEPA-approved modification to that Plan (BBL, 2001).

The annual monitoring described in the Plan is in response to the Consent Decree lodged by the Court on December 15, 1998 (USEPA, 1998a), and the September 30, 1997 *Record of Decision (ROD)* for OU4 (USEPA, 1997). The ROD presents the remedial action selected by the USEPA to address PCBs detected in the sediments of White and Wine Creeks and the adjacent wetlands. The USEPA-selected remedy presented in the OU4 ROD is long-term annual monitoring of PCB levels in sediments and fish in White and Wine Creeks and the adjacent wetlands.

Comments on proposed modifications to the plan (received January 7, 2009) from USEPA for the 2008 Annual PCB Long-Term Monitoring Report (Arcadis, 2008) recommended a sample frequency of every two years till the next Five-Year Data Review Report in early 2013. It was decided that after the scheduled 2012 monitoring event, additional evaluation of the sampling frequency was conducted and the biennial monitoring schedule will continue with 2014, 2016, and 2018 monitoring events leading up to the fifth Five-Year Data Review Report in 2018. This is important because neither the OU4 Consent Decree (USEPA, 1998a) nor ROD (USEPA, 1997) present a timetable for discontinuing the long-term monitoring activities, other than to state that a Remedial Action Completion Report will be completed within 90 days after the Settling Defendants conclude that the remedial action has been fully performed.

As documented in the PAS OU4 Consent Decree (USEPA, 1998a), the 1996 Phase 2 Supplemental Pre-Remedial Design Study (SPRDS) concluded that, although the Site was a source of PCBs before the construction of the containment facility in 1986, the Site is not a present source of PCBs for sediments in White and Wine Creeks or the adjacent wetlands, and that other potential upstream sources of PCBs exist. Additionally, previous PCB sediment monitoring data, collected prior to 1996, indicate that the associated risk levels were relatively



low and that there had been an overall decline in PCB concentrations in the creeks (USEPA, 1998a).

## **2. Overview of the PCB Long-Term Monitoring Activities**

The PCB long-term monitoring activities for the Site identified in the Plan include collecting surficial sediment (0- to 3-inch), subsurface sediment (3- to 6-inch and 6- to 12-inch), suspended sediment (trap), and biota (fish) samples. In the third *Annual Progress Report* (BBL, 2000), BBL proposed that subsurface sediment samples not be collected in the future, and that future long-term monitoring events include the continued collection of only surficial sediment, sediment trap, and fish samples. USEPA approved this modification to the Plan on May 31, 2001 (BBL, 2001).

The results of the previous long-term monitoring events, together with the relevant conclusions, were presented to the USEPA in the previous *Annual Progress Reports* and the four *Five-Year Data Review Reports* (USEPA, 1998b; BBL, 2003; USEPA, 2008 and 2014). The data and conclusions presented in these reports confirm the USEPA (1998a) conclusion that sediment PCB concentrations have decreased since the sampling rounds that were conducted prior to 1996.

## **3. 2016 PCB Long-Term Monitoring Activities**

The monitoring activities conducted by Arcadis during the fourteenth (2016) PCB long-term monitoring event focused on White and Wine Creeks at locations upstream, adjacent to, and downstream of the Site. Specific activities included:

- Sampling of surficial (0- to 3-inch) sediment at one location
- Installing and sampling of a sediment trap at one location
- Fish tissue sampling at five locations

As identified in the OU4 ROD and Consent Decree, data generated from the PCB long-term monitoring program are used to monitor PCB concentrations in sediments and fish of White and Wine Creeks.

### **3.1 Methods**

This section identifies the sampling locations and describes the methods that were used for the surficial sediment, sediment trap, and fish sampling, and the laboratory analyses. The methods employed followed the procedures outlined in the approved Plan.



### 3.1.1 Sample Locations

Historically the Plan identified the collection of co-located sediment, sediment trap, and fish samples from five locations in White and Wine Creeks. The sample locations were identified by the 8-foot sections of iron pipe which were driven into the bank during the 1999 sampling round. These locations were determined based on the results of a probing exercise conducted by BBL in 1999 to locate prime sediment depositional areas, and have been sampled during each of the twelve previous sampling events. These locations (shown on Figure 1) are identified below. Based on the January 27, 2014 comment letter from USEPA, surficial sediment samples and sediment trap samples were only collected at one location in 2016 while fish were collected at all five of the historical sample locations.

- Location 1: Upstream (east) of the Site, in White Creek, near historical sample location SS-1.
- Location 2: Adjacent to and northeast of the Site, in White Creek, in the vicinity of Phase 2 SPRDS sample location White 11A.
- Location 3: Adjacent to and north of the Site, in White Creek, approximately 50 feet downstream of historical sample location SS-3.
- Location 4: North of the Site in White Creek, in the vicinity of Phase 2 SPRDS sample location White 12B.
- Location 5: Downstream (northwest) of the Site, and downstream of the confluence of White and Wine Creeks, in the vicinity of historical sample location SS-4A.

### 3.1.2 Sediment Sampling

Arcadis conducted the sediment sampling on June 2, 2016. As previously discussed only one sediment sample was collected in 2016, from Location 3. Similar to past collection events, the surficial sediment sample was collected from 0 to 3 inches using a stainless steel corer. At the sample location, the corer was pushed into the sediment, and slowly pulled out. The top three inches of the sediment cores were extracted from the stainless steel tube onto an aluminum pan using a brass push rod. The sediment sample was homogenized and placed in an appropriate sample jar for shipment to the laboratory in accordance with procedures identified in the Plan.

### 3.1.3 Sediment Traps

A sediment trap was placed by Arcadis at Location 4 on June 2, 2016. The sediment trap consisted of pre-cleaned sample jars placed in a stainless steel pan. The trap was placed on the bottom in a pool at the historical sediment location and allowed to collect sediment for several weeks. The sediment sample from the trap was retrieved by Arcadis on August 25, 2016 and



placed in an appropriate sampling jar for shipment to the laboratory in accordance with the procedures identified in the Plan.

### **3.1.4 Fish Sampling**

Electrofishing of White and Wine Creeks was conducted on May 24, 2016 by Arcadis scientists. The objective of the electrofishing, as identified in the Plan, was to collect three composite fish samples from each location. The target species were creek chub (*Semotilus atromaculatus*) and two species of stickleback (*Culaea inconstans* and *Gasterosteus aculeatus*).

The fish sampling was conducted using a Smith-Root model LR 20-B backpack electrofishing unit. Following collection, the appropriate target fish were placed in labeled Ziploc®-type bags, and stored on ice prior to sample processing. Sample processing included dividing the fish into three composite samples per location and recording the number of individuals per sample, length range, and total sample weight. The samples were then wrapped and shipped to the analytical laboratory, in accordance with the procedures detailed in the Plan.

### **3.1.5 Laboratory Analyses**

Laboratory analyses of sediment and sediment trap samples included PCBs and total organic carbon (TOC) in accordance with the requirements in the Plan. The analyses were performed by Columbia Analytical Services, Inc. [now ALS Environmental] (Rochester, New York). The analytical method for PCBs was USEPA SW-846 Method 8082 (USEPA, 1986) [as referenced in the current NYSDEC Analytical Services Protocol (ASP)], and for TOC was USEPA Region 2's Lloyd Kahn Method (USEPA, 1988).

The fish samples were analyzed by Pace Analytical Services, Inc. (Green Bay, Wisconsin) for PCBs using USEPA SW-846 Method 8082, as referenced in the current NYSDEC ASP, and for percent lipids using standard gravimetric techniques.

### **3.2 2016 PCB Results**

This section presents the results obtained during the most recent round of the long-term PCB monitoring program. Figure 2 presents the trends (arithmetic means) in PCB data collected at each location.

#### **3.2.1 Sediment Sampling Results**

Analytical results for the surficial sediment sample are presented in Table 1. PCBs were detected in the surficial sediment sample collected at Location 3 at a concentration of 0.16 mg/kg. The TOC concentration in the sediment sample was 19,000 mg/kg [approximately 1.9%].



### 3.2.2 Sediment Trap Sampling Results

Analytical results for the sediment trap sample collected at Location 4 are presented in Table 2. PCBs were detected in the one sediment trap sample at a concentration of 1.08 mg/kg. The TOC concentration was an estimated 52,600 mg/kg [approximately 5.26%].

### 3.2.3 Fish Sampling Results

Whole-body composite samples of fish (creek chub or brook stickleback) were collected from each of the five sampling locations. Three samples were collected from each location for a total of 15 composite fish samples (14 creek chub samples and one brook stickleback sample).

Analytical results for the fish samples are presented in Table 3. PCBs were detected in each of the fish samples (including those from the upstream location). Total PCB concentrations in creek chubs ranged from 0.19 mg/kg (Location 3) to 0.90 mg/kg (Location 3). PCBs were detected in the one brook stickleback sample from Location 4 at a concentration of 0.27 mg/kg. The arithmetic mean total PCB concentration for all of the fish samples collected in 2016 is 0.55 mg/kg.

### 3.2.4 Discussion

The PCB data collected in 2016 represent the fourteenth round of long-term monitoring data. Summaries of the available data from all of the long-term monitoring events are provided in Table 4 (surficial sediment), Table 5 (sediment trap), and Table 6 (fish). The data are also summarized in Figure 2.

#### Surficial Sediment

As previously discussed, a single sediment sample was collected at Location 3 in 2016. For surficial sediment (Table 4), the 2016 data are generally consistent with previous long-term monitoring results for Location 3. The 2016 result (0.16 mg/kg) is within the range of historical concentrations, and below the site cleanup level of 1 mg/kg. The results also represent the lowest PCB concentration from Location 3 since 2005. By comparison, historically the maximum detected PCB concentration at Location 3 has been as high as 2.04 J mg/kg (in 2007) and the 2016 result was 0.16 mg/kg. Overall, the sediment PCB concentrations observed during the 14-year duration of the long-term monitoring program are much lower than those detected during some of the earlier investigations. For example, the maximum detected PCB concentration in OU-4 sediment during the 1996 SPRDS sampling was 11.4 mg/kg.



### Sediment Traps

For sediment trap samples, only a single location (Location 4) was sampled in 2016. The 2016 result (1.08 mg/kg) is within the historical range of PCB concentrations from this location, is slightly above the site cleanup level of 1 mg/kg and is the third lowest concentration since 2004 (Table 5). The highest recorded PCB concentration in sediment trap samples at this location is 5.7 mg/kg, and most year's results were greater than 1 mg/kg.

### Fish

The 2016 fish summary data along with historical ranges and means is presented in Table 6. Mean total PCB concentrations in fish samples in 2016 were highest at Locations 3 and 5 (0.64 mg/kg) and lowest at Location 2 (0.39 mg/kg). In 2016, the arithmetic mean PCB concentrations for each location were lower than the previous sampling event in 2014 except for Locations 4 and 5. The arithmetic mean PCB concentrations at Locations 1, 2, 3 and 4 were some of the lowest observed at these locations during the long-term monitoring program. The overall yearly mean calculated across all samples and locations was the lowest observed since the first year of monitoring in 1999, and in 1999 only 2 locations were sampled. When PCB concentrations were normalized for lipids, the 2016 data are the lowest or close to the lowest values observed during the monitoring at all of the locations. The overall yearly mean of the lipid-normalized PCB concentrations calculated across all locations was the lowest observed during the monitoring period (8.9 mg/kg lipid).

### Overall Trends

The 2016 surficial sediment, sediment trap, and fish tissue data are generally consistent with previous results in that PCB concentrations fluctuate but remain relatively low and continue to decline. PCBs in fish are typically highest at Locations 3 and 4 (Figure 2). This area of White Creek flows through the marsh area northeast of the landfill, and is characterized by slower water velocity and softer sediment deposits. As such, this area likely represents a net depositional area, and a possible sink for the relatively low concentrations of PCBs that remain in the system.

### Risk Summary

Ecological risks from the Site were previously evaluated in the site-specific ecological risk assessment (ERA) [Appendix B of the *Focused Feasibility Study* (ENVIRON, 1997)]. According to the food web models presented in the site-specific ERA, a fish PCB concentration of 1.0 mg/kg results in a hazard quotient (HQ) for piscivorous wildlife (i.e., mink) of 0.82. In response to USEPA comments received on the 2008 *Annual PCB Long-Term Monitoring Report* (Arcadis, 2009), an updated risk evaluation was included in the 2009 *Annual Progress Report* (Arcadis, 2010). This risk evaluation utilized food web models and incorporated dietary modeling



estimates using the most recent (2008) sediment data (maximum detected concentration = 1.26 mg/kg) and fish tissue data (95% Upper Confidence Limit [UCL] = 1.26 mg/kg), and again concluded low ecological risks to mink and green heron. Additionally, as part of the 2013 Five-Year Review Report, Arcadis (2013c) submitted a risk evaluation addendum using 2010 and 2012 sediment and fish data. This risk evaluation concluded low ecological risks to mink and green heron, as predicted previously. Similarly, using the 2016 sediment data (maximum detected concentration = 0.16 mg/kg) and fish tissue data (95% UCL = 0.646 mg/kg) concludes similarly low ecological risk.

#### **4. Summary**

In 2016, surficial sediment, suspended sediment, and fish were collected as part of the PCB long-term monitoring program for OU4 of the Site. The data collected in 2016 indicate the following:

- PCBs were detected in the only surficial sediment sample collected in 2016 (from Location 3), at a concentration of 0.16 mg/kg. The 2016 PCB concentration from this location is the lowest value since 2005, and is below the site cleanup level of 1 mg/kg. Overall, the sediment PCB concentrations remain much lower than those detected during some of the earlier investigations and appear to be declining.
- PCBs were detected in the one sediment trap sample collected in 2016 (from Location 4), at a concentration of 1.08 mg/kg. The 2016 sediment trap PCB concentration is slightly above site cleanup level of 1 mg/kg and is the third lowest value from this location since 2004.
- PCBs were detected in each of the fish tissue samples, with a maximum concentration of 0.90 mg/kg. In 2016, the arithmetic mean PCB concentrations for each location were lower than the previous sampling event in 2014 (except for Locations 4 and 5 which increased slightly).
- Based on the results of a previous site-specific ecological risk assessment (ENVIRON, 1997) that was updated with the most recent PCB data for the site, the 2016 sediment and fish tissue PCB concentrations represent low ecological risk.

Collectively, the 14 years of long-term monitoring data indicate relatively low PCB concentrations in sediment, sediment trap, and fish tissue. Although PCB concentrations are still somewhat variable, they continue to decline. Based on the findings of the next round of sampling in 2018 and USEPA's five-year review, the long-term monitoring program may be re-evaluated to determine the need to change the sample frequency for future monitoring events or discontinue the sampling all together.



## 5. References

- Arcadis. 2009. *Annual Progress Report, Period Covered: January 1, 2008 to December 31, 2008*. Letter from David K. Rigg to Patricia Simmons Pierre of the USEPA. January 2009.
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USEPA. 1999. Letter from Patricia Simmons of USEPA to M. Cathy Geraci of BBL approving the *PCB Long-Term Monitoring Plan.* July 22, 1999.

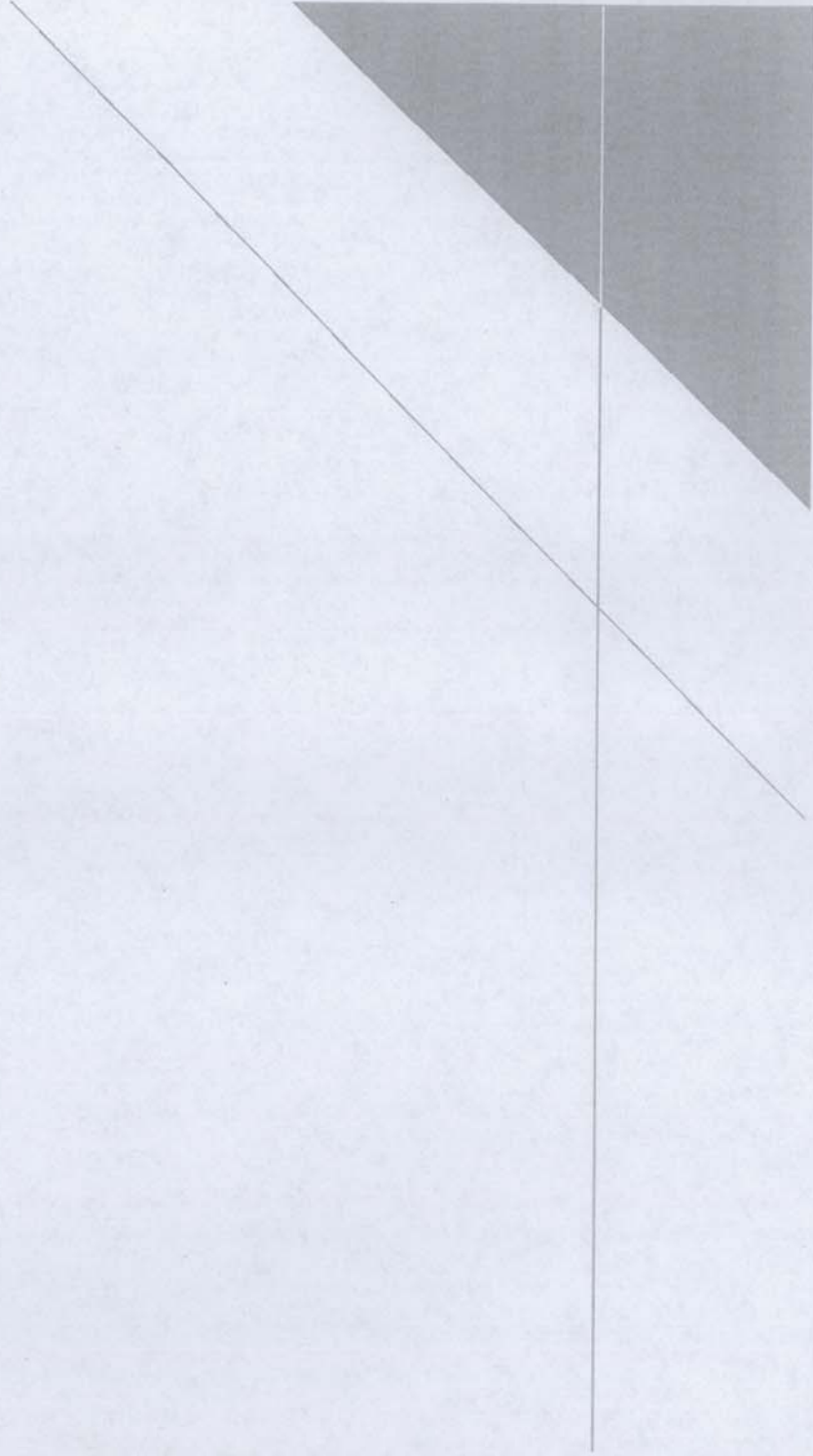
USEPA. 2008. *Five-Year Review Report. Pollution Abatement Services Superfund Site, City of Oswego, Oswego County, New York.* December 2008.

USEPA. 2009. Comments from Patricia Simmons of USEPA to D. Rigg of ARCADIS regarding the *2008 PCB Long-Term Monitoring Report.* January 7, 2009.

USEPA. 2014. Letter from Patricia Simmons Pierre of USEPA to Mr. David Rigg of ARCADIS regarding *Modifications of Periodic Sediment Monitoring Requirements at the Pollution Abatement Services Superfund Site Operable Unit 4, Oswego, New York.* January 27, 2014

USEPA. 2014. *Five-Year Review Report. Pollution Abatement Services Superfund Site, City of Oswego, Oswego County, New York.* January 9, 2014.

## TABLES





**Table 1**

**Surficial Sediment Sample Results for PCBs and TOC (2016)**  
**Pollution Abatement Services Superfund Site**  
**Operable Unit 4**  
**Oswego, New York**  
**PCB Long-Term Monitoring Program Report**

Location	Sample Identification	Total PCB Concentration (mg/kg)	TOC (mg/kg)
3	PAS-SS-301	0.16	19,000

**Notes:**

1. The sample was collected by ARCADIS on June 2, 2016.
2. The sample was analyzed for PCBs using USEPA SW-846 Method 8082 and for total organic carbon (TOC) using USEPA Region 2 Lloyd Kahn Method.
3. NA = Not Applicable. Per the January 27, 2014 comment letter from USEPA, sediment samples were only collected from Location SS-301 in 2014.
4. The sediment sample was collected from the 0- to 3-inch interval.
5. Total PCB concentrations represent total Aroclors.

**Table 2**  
**Sediment Trap Results for PCBs and TOC (2016)**  
**Pollution Abatement Services Superfund Site**  
**Operable Unit 4**  
**Oswego, New York**  
**PCB Long-Term Monitoring Program Report**

Location	Sample Identification	Total PCB Concentration (mg/kg)	TOC (mg/kg)
4	PAS-ST-401	1.08	52600 J

**Notes:**

1. A sediment trap was placed by ARCADIS on June 2, 2016 and retrieved on August 25, 2016.
2. The sample was analyzed for PCBs using USEPA SW-846 Method 8082 and for total organic carbon (TOC) using USEPA Region 2 Lloyd Kahn Method.
3. NA = Not Applicable. Per the January 27, 2014 comment letter from USEPA, a sediment sample was collected from only one location in 2014.
4. J = The compound was positively identified; however, the associated numerical value is an estimated concentration only.
5. Total PCB concentrations represent total Aroclors.



Table 3  
 Fish Tissue Results for PCBs and Percent Lipids (2016)  
 Pollution Abatement Services Superfund Site  
 Operable Unit 4  
 Oswego, New York  
 PCB Long-Term Monitoring Program Report

Sample Identification	Species	No. of Individuals per Sample	Length Range (cm)	Total Sample Weight (g)	Lipid (%)	Total PCB Concentration (mg/kg)	Lipid-Normalized PCB Concentration (mg/kg-lipid)
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<b>Location 1</b>							
PAS-BS-140	Creek chub	7	9.4-9.8	66.6	6.2	0.46	7.3
PAS-BS-141	Creek chub	8	8.1-9.9	61.2	5.1	0.35	6.9
PAS-BS-142	Creek chub	8	7.5-8.5	49.0	7.5	0.57	7.6
<b>Location 2</b>							
PAS-BS-237	Creek chub	2	10.1-10.3	28.1	6.1	0.57	9.4
PAS-BS-238	Creek chub	4	6.2-9.1	26.9	6.9	0.32	4.6
PAS-BS-239	Brook Stickleback	4	5.4-6.6	8.6	2.3	0.27	11.5
<b>Location 3</b>							
PAS-BS-336	Creek chub	7	7.2-9.0	46.5	6.7	0.90	13.5
PAS-BS-337	Creek chub	7	6.4-7.2	32.5	6.3	0.83	13.2
PAS-BS-338	Creek chub	7	4.9-5.8	12.4	6.1	0.19	3.1
<b>Location 4</b>							
PAS-BS-434	Creek chub	6	8.9-9.8	61	7.4	0.82	11.1
PAS-BS-435	Creek chub	5	7.0-8.5	31.4	6.6	0.57	8.7
PAS-BS-436	Creek chub	5	5.4-7.1	18.8	7.4	0.48	6.5
<b>Location 5</b>							
PAS-BS-540	Creek chub	7	8.7-9.9	75.8	6.4	0.63	9.8
PAS-BS-541	Creek chub	7	8.4-9.0	50.8	6.2	0.62	10.0
PAS-BS-542	Creek chub	6	7.9-8.4	35.3	6.7	0.66	9.9

**Notes:**  
 1. Samples were collected by ARCADIS on May 24, 2016.  
 2. Samples were analyzed for PCBs using the USEPA SW-846 Method 8020 and for percent lipids using gravimetric techniques.  
 3. Total PCB concentrations represent total Aroclors.

Table 4  
 Summary of Historic Surficial Sediment PCB Concentrations  
 Pollution Abatement Services Superfund Site  
 Operable Unit 4  
 Oswego, New York  
 PCB Long-Term Monitoring Program Report

Year	Total PCB Concentration (mg/kg)				
	Location 1	Location 2	Location 3	Location 4	Location 5
1999	ND (0.020)	ND (0.030)	ND (0.030)	0.17 J	ND (0.03)
2000	ND (0.021)	0.015 J [0.013 J]	ND (0.042)	0.014 J	ND (0.024)
2001	ND (0.022)	0.042 [0.047]	1.8	0.090	0.034
2002	ND (0.41)	ND (0.052)	0.50	3.1 D	ND (0.049) [ND (0.050)]
2003	ND (0.044)	0.072	0.040 J	0.45	0.21 J [0.047 J]
2004	ND (0.084)	0.054 J	0.30	0.076 J [0.085 J]	0.085 J
2005	ND (0.085)	ND (0.096)	ND (0.080)	ND (0.089) [0.6 J]	0.39
2006	ND (0.10)	0.26	0.70	1.53 [1.76]	0.20
2007	ND (0.087)	ND (0.12)	2.04 J [0.40 J]	0.14	0.23
2008	ND (0.042)	0.14	1.11 [1.41]	0.49	0.25
2010	ND (0.043)	0.137 J	1.07 J	0.639 J [0.509]	0.24 J
2012	ND (0.042)	0.039 J	1.13 J	0.543 J	0.40 UJ [0.27 J]
2014	NA	NA	0.51	NA	NA
2016	NA	NA	0.16	NA	NA

Notes:  
 1. ND = Not detected. Each PCB Aroclor was not detected above the laboratory quantitation limit shown in parentheses.  
 2. NA = Not Applicable. Per the January 27, 2014 comment letter from USEPA, a sediment sample was only collected from Location SS-301 in 2014.  
 3. Duplicate results in brackets.  
 4. J = The compound was positively identified; however, the associated numerical value is an estimated concentration only.  
 5. Sediment samples were collected from the 0- to 3-inch interval.  
 6. Total PCB concentrations represent total Aroclors.  
 7. D = Concentration is based on a diluted sample analysis.  
 8. UJ = The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.



**Table 5**  
**Summary of Historic Sediment Trap PCB Concentrations**  
**Pollution Abatement Services Superfund Site**  
**Operable Unit 4**  
**Oswego, New York**  
**PCB Long-Term Monitoring Program Report**

Year	Total PCB Concentration (mg/kg)				
	Location 1 PAS-ST-101	Location 2 PAS-ST-201	Location 3 PAS-ST-301	Location 4 PAS-ST-401	Location 5 PAS-ST-501
1999	ND (0.080)	0.53	1.2 [1.2]	0.86	0.06
2000	ND (0.033)	0.25	0.62	1.1	0.42 [0.48]
2001	ND (0.12)	0.30 [0.25]	0.42	1.4	0.081
2002	ND (0.15)	0.81 [0.50]	ND (0.17)	0.96	0.19
2003	ND (0.14)	0.32	0.059 J	0.32 J	0.25 J [0.33]
2004	ND (1.0)	0.40 J	0.40 J	1.7 J [1.0 J]	0.40 J
2005	ND (0.073)	0.63 J	1.05 J	1.66 [1.68 J]	1.04 JN
2006	ND (0.38)	0.34	0.39	5.7	0.86 [0.53]
2007	ND (0.44)	0.32	0.49	1.29 [1.30]	0.30
2008	0.090	0.42	0.65	3.60 [5.19]	1.27
2010	0.059 J	1.08 J	0.95 J	2.76 J [3.90 J]	0.40 J
2012	ND (0.18)	0.36 UJ	ND (0.15)	0.38 J [0.67 J]	0.11 UJ
2014	NA	NA	NA	0.54 J	NA
2016	NA	NA	NA	1.08	NA

**Notes:**

1. ND = Not detected. Each PCB Aroclor was not detected above the laboratory quantitation limit shown in parentheses.
2. NA = Not Applicable. Per the January 27, 2014 comment letter from USEPA, a sediment sample was only collected from one location in 2014.
3. Duplicate results in brackets.
4. J = The compound was positively identified; however, the associated numerical value is an estimated concentration only.
5. Total PCB concentrations represent total Aroclors.
6. N = The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
7. UJ = The compound was not detected above the reported sample quantitation limit. However, the reported limit is approximate and may or may not represent the actual limit of quantitation.

Table 6  
 Summary of Historic Fish Tissue PCB Concentrations  
 Pollution Abatement Services Superfund Site  
 Operable Unit 4  
 Oswego, New York  
 PCB Long-Term Monitoring Program Report

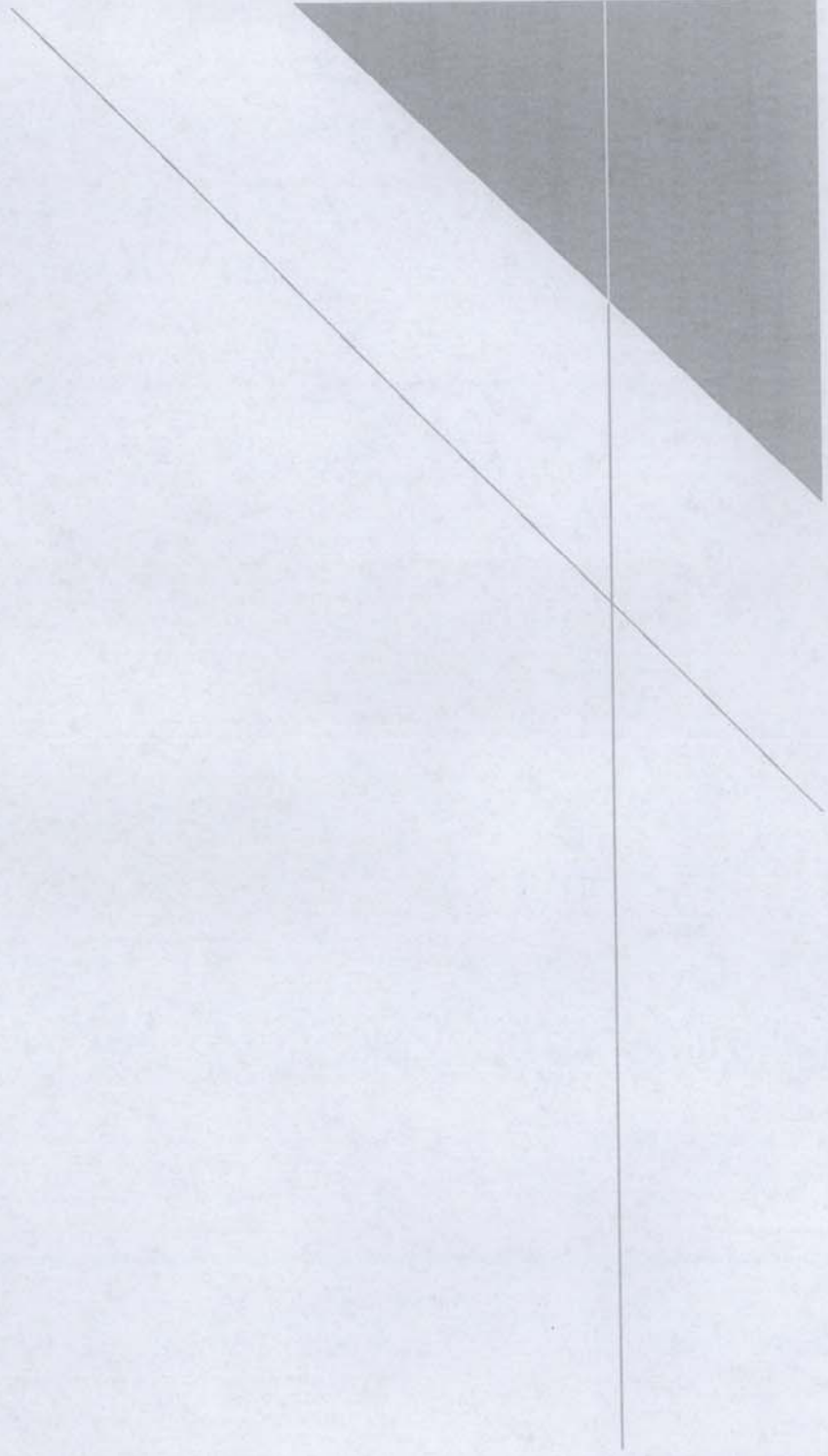
Year	Location 1		Location 2		Location 3		Location 4		Location 5	
	Arithmetic Mean	Range	Arithmetic Mean	Range	Arithmetic Mean	Range	Arithmetic Mean	Range	Arithmetic Mean	Range
1999	0.43 - 0.47	0.46	no data	0.27 - 0.57	0.39	no data	2.70 - 3.30	0.33 - 0.52	0.40	0.43
2000	1.10 - 1.50	1.30	2.80 - 3.60	0.46	3.23	3.00 - 3.90	2.50 - 3.40	0.72 - 1.40	1.04	2.32
2001	1.10 - 1.70	1.40	2.20 - 2.40	0.87 - 1.30	2.27	2.40 - 2.80	2.90	0.74 - 1.40	1.04	2.02
2002	0.32 - 0.55	0.46	0.87 - 1.30	0.46	1.09	0.84 - 1.00	0.93 - 1.70	0.67 - 0.96	0.79	0.91
2003	0.098 - 0.26	0.18	0.30 - 0.46	0.30	0.38	0.41 - 0.72	0.25 - 1.20	0.70 - 2.00	1.33	0.66
2004	0.45 - 0.96	0.65	0.91 - 1.80	1.37	1.37	0.99 - 2.80	1.30 - 1.70	1.10 - 1.30	1.20	1.27
2005	0.21 - 1.00	0.59	0.74 - 1.70	1.22	1.22	0.72 - 0.96	1.70 - 1.80	0.45 - 1.49	1.07	1.09
2006	0.37 - 0.54	0.48	0.47 - 0.64	0.53	0.53	0.74 - 0.93	1.28 - 1.50	0.56 - 0.79	0.70	0.78
2007	0.62 - 0.88	0.79	1.30 - 1.40	1.37	1.37	1.00 - 1.20	1.90 - 1.90	1.40 - 1.60	1.50	1.24
2008	0.52 - 0.68	0.61	0.93 - 1.10	1.01	1.01	0.82 - 1.10	1.90 - 2.20	0.54 - 1.00	0.78	1.01
2010	0.53 - 0.93	0.78	1.01 - 1.47	1.30	1.30	1.46 - 1.80	2.14 - 4.09	1.55 - 2.13	1.76	1.63
2012	0.54 - 0.77	0.67	0.68 - 1.05	0.88	0.88	0.64 - 0.85	2.26 - 2.91	0.75 - 0.98	0.88	1.16
2014	0.48 - 0.51	0.49	0.83 - 0.92	0.87	0.87	0.65 - 1.05	0.25 - 0.68	0.13 - 0.33	0.23	0.59
2016	0.35 - 0.57	0.46	0.27 - 0.57	0.39	0.39	0.19 - 0.90	0.48 - 0.82	0.62 - 0.66	0.64	0.55

Year	Location 1		Location 2		Location 3		Location 4		Location 5	
	Arithmetic Mean	Range	Arithmetic Mean	Range	Arithmetic Mean	Range	Arithmetic Mean	Range	Arithmetic Mean	Range
1999	8.7 - 11	10	no data	5 - 12	9	no data	no data	7.0 - 11	8.5	9.1
2000	24 - 34	30	77 - 88	83	83	68 - 87	84 - 90	14 - 16	15	58.1
2001	24 - 31	27	43 - 50	47	61	56 - 68	48 - 73	11 - 17	14	42.3
2002	9.0 - 13	10	12 - 44	26	26	17 - 30	22 - 23	8.3 - 15	11	18.7
2003	3.0 - 11	6.1	11 - 44	26	30	23 - 84	8 - 15	11 - 30	20	18.9
2004	19 - 35	27	20 - 38	31	57	29 - 84	26 - 48	17 - 20	19	33.5
2005	10 - 25	16	35 - 46	42	40	28 - 54	56 - 113	17 - 27	23	41.4
2006	6.9 - 10	8.4	16 - 31	25	20	20 - 29	22 - 28	9.3 - 19	18	20.6
2007	12 - 15	14	27 - 33	30	27	22 - 29	48 - 48	17 - 19	18	23.8
2008	12 - 15	13	10 - 25	18	16	11 - 22	55 - 56	10 - 14	12	20.6
2010	10 - 17	14	20 - 21	21	26	23 - 29	46 - 87	27 - 34	31	29.4
2012	10 - 13	11	13 - 22	18	15	13 - 16	43 - 67	11 - 17	14	23.1
2014	7 - 11	8	10 - 15	12	14	10 - 16	9 - 12	2 - 7	4	9.9
2016	6.9 - 8	7.3	5 - 12	9	10	3 - 13	6.5 - 11	9.8 - 10.0	8.9	8.9

Notes:  
 1. ND = Not detected. Each PCB Aroclor was not detected above the laboratory quantitation limit shown in parentheses.  
 2. Total PCB concentrations represent total Aroclors.  
 3. NA = Not Available. Fish tissue samples were not collected from this location during this event.  
 4. Yearly mean is the arithmetic mean of all samples collected for that year.

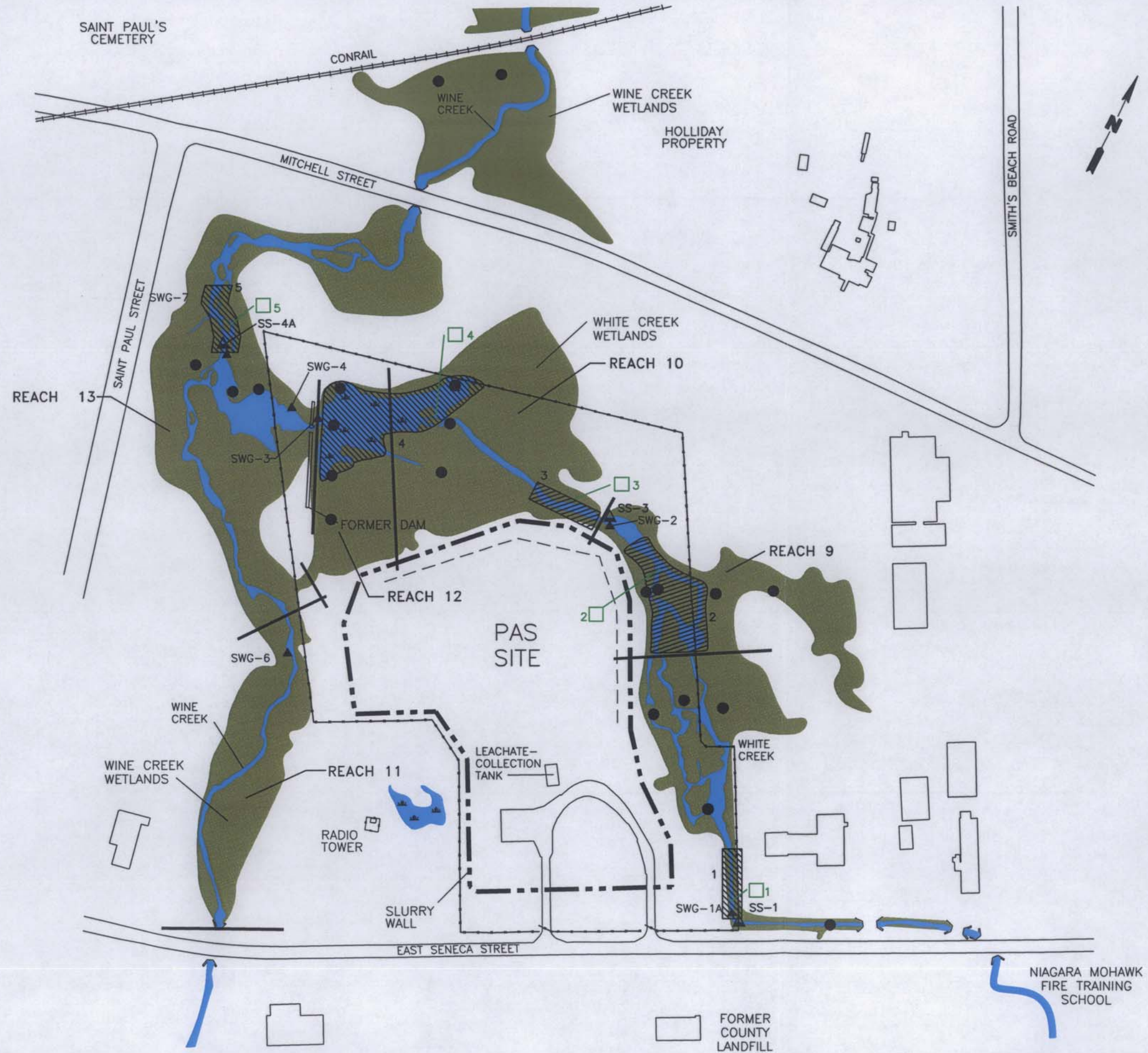


## FIGURES



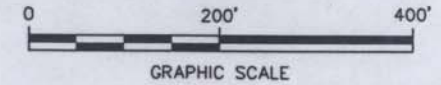


CITY: SVL DIV/GRP: 65 DE: KMD NES KESLD: AM: PD: TM: LVR ONA OFF-REF: TR: 2/13/2008 1:03 PM ACADVER: 17.05 (LMS TECH) PAGESETUP: BL-PDFPLOTSYLETABLE: PLTFULL-CTB PLOTTED: 2/13/2008 1:03 PM BY: STINSON, KATE  
 G:\CAD\ACT\B030344\000000003\DWG\PCB\3644403.DWG LAYOUT: 15AVED: 2/13/2008 1:03 PM ACADVER: 17.05 (LMS TECH) PAGESETUP: BL-PDFPLOTSYLETABLE: PLTFULL-CTB PLOTTED: 2/13/2008 1:03 PM BY: STINSON, KATE  
 XREFS: IMAGES: PROJECTNAME: ---



- LEGEND:**
- 1 [Hatched Box] APPROXIMATE LONG-TERM MONITORING FISH SAMPLING LOCATION
  - 1 [Green Box] APPROXIMATE LONG-TERM MONITORING SEDIMENT SAMPLING LOCATION
  - SS-1 [Triangle] APPROXIMATE PREVIOUS SEDIMENT SAMPLING LOCATION
  - SWG-1 [Triangle] APPROXIMATE STREAM GAUGE LOCATION
  - APPROXIMATE SPRDS PHASE II SEDIMENT SAMPLING LOCATION
  - FENCE (SITE BOUNDARY)
  - - - SLURRY WALL
  - - - APPROXIMATE LOCATION OF SUBSURFACE LEACHATE COLLECTION TRENCH
  - [Wavy Lines] LAND AREAS SUBJECT TO FREQUENT, SHALLOW INUNDATION
  - [Green Area] WETLAND AREAS DELINEATED BY MENZIE-CURA & ASSOCIATES, INC. (AUGUST 1992)
  - REACH BOUNDARY

- NOTES:**
1. BASE MAP ADAPTED FROM TOPOGRAPHIC MAP DEVELOPED BY LOCKWOOD MAPPING, INC. BASED ON AN APRIL 14, 1993 AERIAL PHOTOGRAPH; SOME WELL AND STREAM-GAUGE LOCATIONS ARE INFERRED; LOCATION OF SLURRY WALL BASED ON SITE PLAN DRAWN BY DUNN GEOSCIENCE CORP. (DEC. 1984), TITLED "BORING, WELL & TEST PIT PLOT PLAN;" LOCATION OF SUBSURFACE LEACHATE-RECOVERY TRENCHES BASED ON SITE MAP PROVIDED BY O'BRIEN & GERE ENGINEERING INC.
  2. SURFACE WATER IS SHOWN IN BLUE; AREAS SHADED GREEN REPRESENT WETLAND AREAS DELINEATED BY MENZIE-CURA & ASSOCIATES, INC. (AUGUST 1992).
  3. BOUNDARIES FOR REACH 10 AND REACH 12, AS WELL AS SPRDS PHASE II SAMPLING LOCATIONS WERE PRESENTED IN THE FINAL FOCUSED FEASIBILITY STUDY FOR PCB-IMPACTED SEDIMENTS IN THE VICINITY OF THE PAS SUPERFUND SITE, OSWEGO, NEW YORK (ENVIRON, AUGUST 20, 1997).



POLLUTION ABATEMENT SERVICES SITE  
 OSWEGO, NEW YORK  
**PCB LONG-TERM MONITORING DATA REPORT**

**SAMPLE LOCATION MAP**

**ARCADIS** Design & Consultancy  
 for natural and built assets

FIGURE  
**1**



