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ENVIRONMENT

Ms. Patricia Simmons-Pierre
Project Manager
Central New York Remediation Section
USEPA Region 2
290 Broadway, 20th Floor
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Subject:
Pollution Abatement Services Superfund Site – Fourth Operable Unit
Oswego, New York
Annual Progress Report - 2012

Date:
April 16, 2013

Contact:
David K. Rigg

Phone:
518.250.7379

Email:
david.rigg@arcadis-us.com

Our ref:
B0036444.0012

Dear Ms. Simmons-Pierre:

On behalf of National Grid, please find enclosed the Annual Progress Report which describes the activities performed during 2012 in connection with the fourth operable unit (OU4) at the Pollution Abatement Services (PAS) Superfund Site located in Oswego, New York.

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 you may know, GM filed for bankruptcy in 2009.

As stated in the Annual Progress Report, monitoring was conducted in 2012, and will subsequently continue in two year intervals (next sampling in 2014), until changed with USEPA concurrence. The monitoring includes sampling and analysis of sediments, sediment traps, and fish tissue.

Please feel free to call me at (518) 250-7379 if you have any questions regarding the enclosed.

Sincerely,

ARCADIS of New York, Inc.

David K. Rigg
Principal Scientist

Enclosure

Copies:
Carol Berns, New York/Caribbean Superfund Branch, Office of Regional Counsel, United States Environmental Protection Agency, Region 2
Payson Long, Division of Hazardous Waste Remediation, New York State Department of Environmental Conservation
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Pollution Abatement Services Superfund Site
Oswego, New York
Fourth Operable Unit

Annual Progress Report
Period Covered: January 1, 2012 - December 31, 2012

This document represents the 2012 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 2012 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).

I. Actions Taken Toward Compliance with the Consent Decree

During this 2012 reporting period, the twelfth round of PCB monitoring activities was completed. The monitoring activities were conducted in accordance with the USEPA-approved Plan, as modified in 2001 and 2009. The monitoring activities included collecting surficial sediment, sediment trap, 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 2011 was submitted to USEPA on March 21, 2012.

IV. Planned Activities for 2013

On January 7, 2009 USEPA provided comments to the ARCADIS (2008) *Annual PCB Long-Term Monitoring Report*. The comments recommended that the monitoring be conducted once every two years for the next two rounds (i.e., sampling in 2010 and 2012). Based on the next Five-Year Data Review Report in early 2013, the frequency of the monitoring will be addressed. Therefore, there are no monitoring activities planned for 2013.

V. Delays Encountered or Anticipated

No delays were encountered during 2012, and no delays are anticipated during 2013.

VI. Modifications to Plans or Schedules

There were no modifications to the Plan and/or associated schedules during 2012.

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 (2012)

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

1. Introduction

This *Annual PCB Long-Term Monitoring Report (2012)* provides a summary of the polychlorinated biphenyl (PCB) data collected in 2012 at the Pollution Abatement Services (PAS) Superfund Site (the Site) located in Oswego, New York. This report describes the twelfth 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, 1998), 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. After the scheduled 2012 monitoring event, additional evaluation of the sampling frequency will be conducted. This is important because neither the OU4 Consent Decree (USEPA, 1998) 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, 1998), 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, 1998).

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 30, 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 two *Five-Year Data Review Reports* (BBL, 2003 and USEPA, 2008). The data and conclusions presented in these reports confirm the USEPA (1998) conclusion that sediment PCB concentrations have decreased since the sampling rounds that were conducted prior to 1996.

3. 2012 PCB Long-Term Monitoring Activities

The monitoring activities conducted by ARCADIS during the twelfth (2012) 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) sediments;
- Installing and sampling of sediment traps; and
- Fish tissue sampling.

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

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 sampling events. These locations (shown on Figure 1) are identified below.

- 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 26, 2012. The surficial sediment samples were collected at each of the aforementioned locations from 0 to 3 inches using a stainless steel corer. At each 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 samples were homogenized and placed in the appropriate sampling jars for shipment to the laboratory, in accordance with procedures identified in the Plan.

3.1.3 Sediment Traps

Sediment traps were placed by ARCADIS at each of the five sediment sampling locations described above on June 26, 2012. The sediment traps consisted of pre-cleaned sample jars placed in stainless steel pans. The traps were monitored periodically by ARCADIS for the collection of deposited sediment. Sediment samples from the traps were retrieved by ARCADIS from all locations on August 16, 2012 and placed in the appropriate sampling jars 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 June 18, 2012 by ARCADIS. 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 chubs (*Semotilus atromaculatus*) and two species of stickleback (*Culaea inconstans*, *Gasterosteus aculeatus*).

The fish sampling was conducted using a 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. Individual fish lengths, numbers of individuals per sample, and total sample weight were recorded. 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 2012 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 surficial sediment samples are presented in Table 1. PCBs were detected in four of the five surficial sediment samples at concentrations ranging from 0.039 mg/kg (PAS-SS-201) to 1.13 mg/kg (PAS-SS-301). PCBs were not detected at a concentration exceeding the associated laboratory quantitation limit in the surficial sediment sample collected from Location 1. TOC concentrations ranged from approximately 950 mg/kg [0.095%]) (PAS-SS-101) to 21,100 mg/kg [2.1%] (PAS-SS-301). Notably, the sample with the highest PCB concentration also had the highest percentage of TOC.

3.2.2 Sediment Trap Sampling Results

Analytical results for sediment trap samples are presented in Table 2. PCBs were detected in one of the five sediment trap samples, at a concentration of 0.38 mg/kg (PAS-ST-401) in the parent sample and 0.67 mg/kg in the duplicate sample at Location 4. TOC concentrations ranged from approximately 2.7% (PAS-ST-101) to 6.3% (PAS-ST-201).

3.2.3 Fish Sampling Results

Whole-body composite samples of fish (creek chub) were collected from each of the five sampling locations. Three samples were collected from each location.

Analytical results for 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 0.54 mg/kg (Location 1) to 2.91 mg/kg (Location 4). The arithmetic mean total PCB for all of the fish samples collected in 2012 is 1.16 mg/kg.

3.2.4 Discussion

The PCB data collected in 2012 represent the twelfth 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

For surficial sediment (Table 4), the 2012 data are generally consistent with previous long-term monitoring results. PCB concentrations in surficial sediment are typically highest at Locations 3 and 4, and PCBs are non-detect at Location 1. The maximum detected surficial sediment PCB concentration in 2012 was 1.13 mg/kg (collected from Location 3). By comparison, historically the maximum detected PCB concentrations have been as high as 3.1 mg/kg (in 2002 from Location 4). Overall, the sediment PCB concentrations observed during the fourteen 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 concentration in OU-4 during the 1996 SPRDS sampling was 11.4 mg/kg.

Sediment Traps

For sediment traps, the 2012 data follow a pattern consistent with previous years (Table 5). PCB concentrations are typically lowest at Location 1, and consistently highest at Location 4. In 2012 the maximum detected PCB concentration for sediment trap samples was 0.67 mg/kg (from Location 4, duplicate sample). In comparison, historic PCB concentrations for Location 4 ranged from 0.32 mg/kg (2003) to 5.7 mg/kg (2006). Collectively, the sediment trap data do not show an overall temporal trend in PCB concentrations.

Fish

For fish, the 2012 data are similar to previous results in that concentrations are generally highest for Location 4 and lowest at Location 1 (Table 6). In 2012, the arithmetic mean PCB

concentrations for each location were lower than the previous sampling event in 2010. The arithmetic mean PCB concentration at Location 3 (0.76 mg/kg) was amongst the lowest observed during the long-term monitoring program. Generally similar trends are evident for the lipid-normalized PCB concentrations.

Overall Trends

The 2012 surficial sediment, sediment trap, and fish tissue data are consistent with previous results in that PCB concentrations fluctuate but remain relatively low. PCBs 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. Similarly, using the 2012 sediment data (maximum detected concentration = 1.13 mg/kg) and fish tissue data (95% UCL = 2.03 mg/kg) concludes similarly low ecological risk.

4. Summary

In 2012, 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 2012 indicate the following:

- PCBs were detected in four out of five surficial sediment samples, with a maximum concentration of 1.13 mg/kg. The 2012 data are generally consistent with previous long-term monitoring results. Overall, the sediment PCB concentrations remain much lower than those detected during some of the earlier investigations.

- PCBs were detected in one of the five sediment trap samples, with a maximum concentration of 0.67 mg/kg (duplicate sample). The sediment trap PCB concentrations are generally

consistent with previous monitoring data, and collectively the sediment trap data do not show an overall temporal trend in PCB concentrations.

- PCBs were detected in each of the fish tissue samples, with a maximum concentration of 2.91 mg/kg. In 2012, the arithmetic mean PCB concentrations for each location were lower than the previous sampling event in 2010.

- Based on the results of a previous site-specific ecological risk assessment (ENVIRON, 1997) and current risk evaluation, the 2012 fish tissue PCB concentrations represent a continually low ecological risk.

- PCB concentrations in surficial sediment, sediment trap, and fish tissue samples are typically highest at Locations 3 and 4. This area of White Creek is characterized by slower water velocity and softer sediment deposits. As such, this area likely represents a sink for the relatively low concentrations of PCBs that remain in the system.

Collectively, the twelve years of long-term monitoring data indicate relatively low (yet variable) PCB concentrations in sediment, sediment trap, and fish tissue. Based on the findings of the USEPA's pending 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.

5. References

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BBL. 2000. *Annual Progress Report, Period Covered: January 1, 2000 - December 31, 2000*. Letter from M. Cathy Geraci of BBL to the USEPA Chief, Central New York Remediation Section. December 1, 2000.

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USEPA. 1988. *Determination of Total Organic Carbon in Sediment (Lloyd Kahn Method)*. USEPA Region 2, Environmental Services Division. Edison, NJ. July 27, 1988.

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

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Table 1

Pollution Abatement Services Superfund Site
Operable Unit 4
Oswego, New York
PCB Long-Term Monitoring Program Report

Surficial Sediment Sample Results for PCBs and TOC (2012)

Location	Sample Identification	Total PCB Concentration (mg/kg)	TOC (mg/kg)
1	PAS-SS-101	ND (0.042)	950 J
2	PAS-SS-201	0.039 J	13,400 J
3	PAS-SS-301	1.13 J	21,100 J
4	PAS-SS-401	0.543 J	15,900 J
5	PAS-SS-501	0.40 UJ [0.27 J]	4,140 J [8,060 J]

Notes:

1. Samples were collected by ARCADIS on June 26, 2012.
2. Samples were analyzed for PCBs using USEPA SW-846 Method 8082 and for total organic carbon (TOC) using USEPA Region 2 Lloyd Kahn Method.
3. ND = Not detected. TOC or each PCB Aroclor was not detected above the laboratory quantitation limit shown in parentheses.
4. J = The compound was positively identified; however, the associated numerical value is an estimated concentration only.
5. 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.
6. Duplicate results in brackets.
7. Sediment samples were collected from the 0- to 3-inch interval.
8. Total PCB concentrations represent total Aroclors.

Table 2

Pollution Abatement Services Superfund Site
Operable Unit 4
Oswego, New York
PCB Long-Term Monitoring Program Report

Sediment Trap Results for PCBs and TOC (2012)

Location	Sample Identification	Total PCB Concentration (mg/kg)	TOC (mg/kg)
1	PAS-ST-101	ND (0.18)	27,300
2	PAS-ST-201	0.36 UJ	63,000
3	PAS-ST-301	ND (0.15)	54,200
4	PAS-ST-401	0.38 J [0.67 J]	40,900 [27,000]
5	PAS-ST-501	0.11 UJ	51,200

Notes:

1. Sample traps were placed by Arcadis on June 26, 2012, and retrieved on August 16, 2012.
2. Samples were analyzed for PCBs using USEPA SW-846 Method 8082 and for total organic carbon (TOC) using USEPA Region 2 Lloyd Kahn Method.
3. ND = Not detected. Each PCB Aroclor was not detected above the laboratory quantitation limit shown in parentheses.
4. Duplicate results in brackets.
5. J = The compound was positively identified; however, the associated numerical value is an estimated concentration only.
6. UJ = The compound was not detected above the reported sample quantitation limit. However, thereported limit is approximate and may or may not represent the actual limit of quantitation.
7. Total PCB concentrations represent total Aroclors.

Table 3

Pollution Abatement Services Superfund Site
Operable Unit 4
Oswego, New York
PCB Long-Term Monitoring Program Report

Fish Tissue Results for PCBs and Percent Lipids (2012)

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)
Location 1							
PAS-BS-134	Creek Chub	6	7.9 - 8.6	38.8	5.6	0.54	9.7
PAS-BS-135	Creek Chub	10	6.5 - 7.0	31.8	5.5	0.70	12.7
PAS-BS-136	Creek Chub	8	7.0 - 8.4	38.8	7.3	0.77	10.6
Location 2							
PAS-BS-231	Creek Chub	4	8.5 - 9.0	32.2	4.2	0.91	21.6
PAS-BS-232	Creek Chub	10	7.0 - 8.0	50.5	5.1	1.05	20.6
PAS-BS-233	Creek Chub	10	6.1 - 7.2	33.3	5.1	0.68	13.3
Location 3							
PAS-BS-330	Creek Chub	3	7.9 - 8.2	17.3	4.9	0.79	16.1
PAS-BS-331	Creek Chub	4	7.0 - 7.6	18.6	6.0	0.85	14.2
PAS-BS-332	Creek Chub	8	5.2 - 6.8	21.8	4.8	0.64	13.3
Location 4							
PAS-BS-427	Creek Chub	5	6.8 - 7.7	24.9	5.3	2.26	42.6
PAS-BS-428	Creek Chub	10	6.2 - 6.8	30.1	4.7	2.91	61.9
PAS-BS-429	Creek Chub	13	5.8 - 6.2	31.9	4.0	2.68	67.0
Location 5							
PAS-BS-534	Creek Chub	5	8.2 - 9.7	40.2	5.9	0.98	16.6
PAS-BS-535	Creek Chub	7	7.8 - 8.3	41.7	5.8	0.90	15.6
PAS-BS-536	Creek Chub	9	6.2 - 7.0	33.6	6.7	0.75	11.2

Notes:

1. Samples were collected by Arcadis on June 18, 2012.
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

Pollution Abatement Services Superfund Site
Operable Unit 4
Oswego, New York
PCB Long-Term Monitoring Program Report

Summary of Historic Surficial Sediment PCB Concentrations

Year	Total PCB Concentration (mg/kg)				
Location	**PAS-SS-101**	**PAS-SS-201**	**PAS-SS-301**	**PAS-SS-401**	**PAS-SS-501**
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]

Notes:
1. ND = Not detected. Each PCB Aroclor was not detected above the laboratory quantitation limit shown in parentheses.
2. Duplicate results in brackets.
3. J = The compound was positively identified; however, the associated numerical value is an estimated concentration only.
4. Sediment samples were collected from the 0- to 3-inch interval.
5. Total PCB concentrations represent total Aroclors.
6. D = Concentration is based on a diluted sample analysis.

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 5

Pollution Abatement Services Superfund Site
Operable Unit 4
Oswego, New York
PCB Long-Term Monitoring Program Report

Summary of Historic Sediment Trap PCB Concentrations

Year / Location	Total PCB Concentration (mg/kg)				
	PAS-ST-101	PAS-ST-201	PAS-ST-301	PAS-ST-401	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

Notes:
1. ND = Not detected. Each PCB Aroclor was not detected above the laboratory quantitation limit shown in parentheses.
2. Duplicate results in brackets.
3. J = The compound was positively identified; however, the associated numerical value is an estimated concentration only.
4. Total PCB concentrations represent total Aroclors.
5. N = The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
6. 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

Pollution Abatement Services Superfund Site
Operable Unit 4
Oswego, New York
PCB Long-Term Monitoring Program Report

Summary of Historic Fish Tissue PCB Concentrations

Year	Total PCB Concentration (mg/kg)									
	Location 1		Location 2		Location 3		Location 4		Location 5	
	Range	Arithmetic Mean	Range	Arithmetic Mean	Range	Arithmetic Mean	Range	Arithmetic Mean	Range	Arithmetic Mean
1999	0.43 - 0.47	0.46	no data	NA	no data	NA	no data	NA	0.33 - 0.52	0.40
2000	1.10 - 1.50	1.30	2.80 - 3.60	3.23	3.00 - 3.90	3.30	2.70 - 3.30	3.00	0.72 - 0.81	0.77
2001	1.10 - 1.70	1.40	2.20 - 2.40	2.27	2.40 - 2.80	2.57	2.50 - 3.40	2.90	0.74 - 1.40	1.04
2002	0.32 - 0.55	0.46	0.87 - 1.30	1.09	0.84 - 1.00	0.93	0.93 - 1.70	1.28	0.67 - 0.96	0.79
2003	0.098 - 0.26	0.18	0.30 - 0.46	0.38	0.41 - 0.72	0.60	0.25 - 1.20	0.80	0.70 - 2.00	1.33
2004	0.45 - 0.96	0.65	0.91 - 1.80	1.37	0.99 - 2.80	1.63	1.30 - 1.70	1.50	1.10 - 1.30	1.20
2005	0.21 - 1.00	0.59	0.74 - 1.70	1.22	0.72 - 0.96	0.82	1.70 - 1.80	1.74	0.45 - 1.49	1.07
2006	0.37 - 0.54	0.48	0.47 - 0.64	0.53	0.74 - 0.93	0.84	1.28 - 1.50	1.39	0.56 - 0.79	0.70
2007	0.62 - 0.88	0.79	1.30 - 1.40	1.37	1.00 - 1.20	1.10	1.90 - 1.90	1.90	1.40 - 1.60	1.50
2008	0.52 - 0.68	0.61	0.93 - 1.10	1.01	0.82 - 1.10	0.97	1.90 - 2.20	2.05	0.54 - 1.00	0.78
2010	0.53 - 0.93	0.78	1.01 - 1.47	1.30	1.46 - 1.80	1.68	2.14 - 4.09	3.12	1.55 - 2.13	1.76
2012	0.54 - 0.77	0.67	0.68 - 1.05	0.88	0.64 - 0.85	0.76	2.26 - 2.91	2.62	0.75 - 0.98	0.88

Year	Lipid-Normalized PCB Concentration (mg/kg-lipid)									
	Location 1		Location 2		Location 3		Location 4		Location 5	
	Range	Arithmetic Mean	Range	Arithmetic Mean	Range	Arithmetic Mean	Range	Arithmetic Mean	Range	Arithmetic Mean
1999	8.7 - 11	10	no data	NA	no data	NA	no data	NA	7.0 - 11	8.5
2000	24 - 34	30	77 - 88	83	68 - 87	77	84 - 90	86	14 - 16	15
2001	24 - 31	27	43 - 50	47	56 - 68	61	48 - 73	62	11 - 17	14
2002	9.0 - 13	10	12 - 44	26	17 - 30	24	22 - 23	23	8.3 - 15	11
2003	3.0 - 11	6.1	11 - 44	26	23 - 42	30	8 - 15	12	11 - 30	20
2004	19 - 35	27	20 - 38	31	29 - 84	57	26 - 48	34	17 - 20	19
2005	10 - 25	16	35 - 46	42	28 - 54	40	56 - 113	86	17 - 27	23
2006	6.9 - 10	8.4	16 - 31	25	20 - 21	20	22 - 28	26	9.3 - 56	11
2007	12 - 15	14	27 - 33	30	22 - 29	27	48 - 48	48	17 - 19	18
2008	12 - 15	13	10 - 25	18	11 - 22	16	55 - 56	56	10 - 14	12
2010	10 - 17	14	20 - 21	21	23 - 29	26	46 - 87	66	27 - 34	31
2012	10 - 13	11	13 - 22	18	13 - 16	15	43 - 67	57	11 - 17	14

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.

LEGEND:

- APPROXIMATE LONG-TERM MONITORING FISH SAMPLING LOCATION
- APPROXIMATE LONG-TERM MONITORING SEDIMENT SAMPLING LOCATION
- APPROXIMATE PREVIOUS SEDIMENT SAMPLING LOCATION
- APPROXIMATE STREAM GAUGE LOCATION
- APPROXIMATE SPRDS PHASE II SEDIMENT SAMPLING LOCATION
- FENCE (SITE BOUNDARY)
- SLURRY WALL
- APPROXIMATE LOCATION OF SUBSURFACE LEACHATE COLLECTION TRENCH
- LAND AREAS SUBJECT TO FREQUENT, SHALLOW INUNDATION
- 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).

0 200' 400'

GRAPHIC SCALE

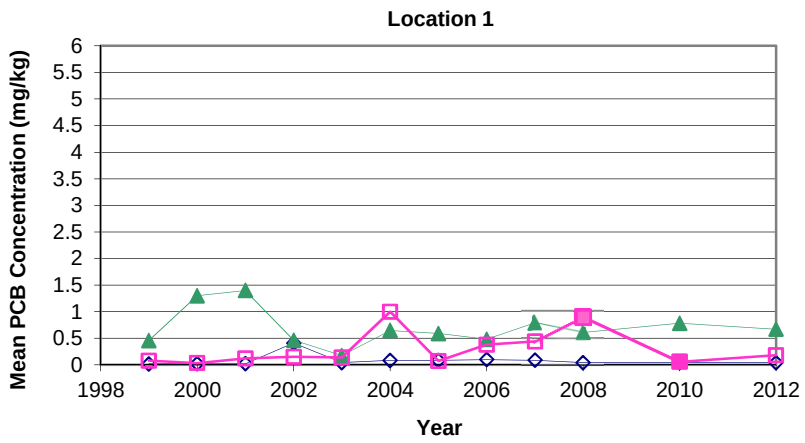
POLLUTION ABATEMENT SERVICES SITE
OSWEGO, NEW YORK

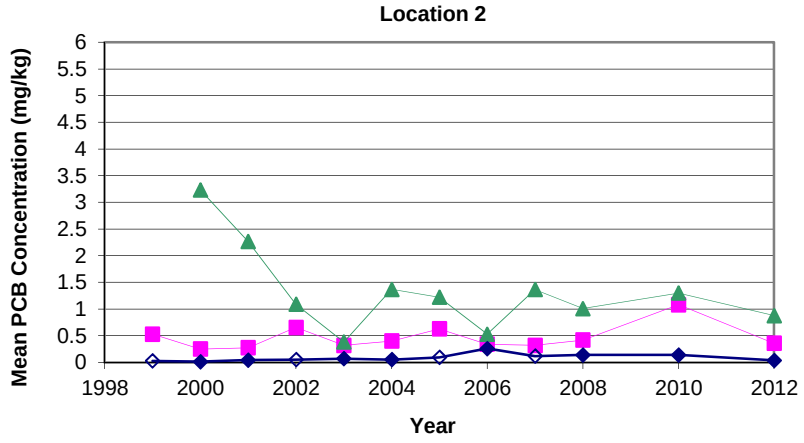
PCB LONG-TERM MONITORING DATA REPORT

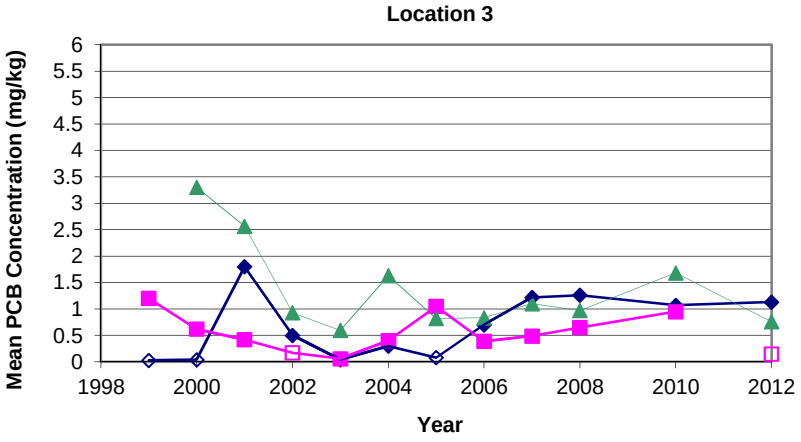
SAMPLE LOCATION MAP

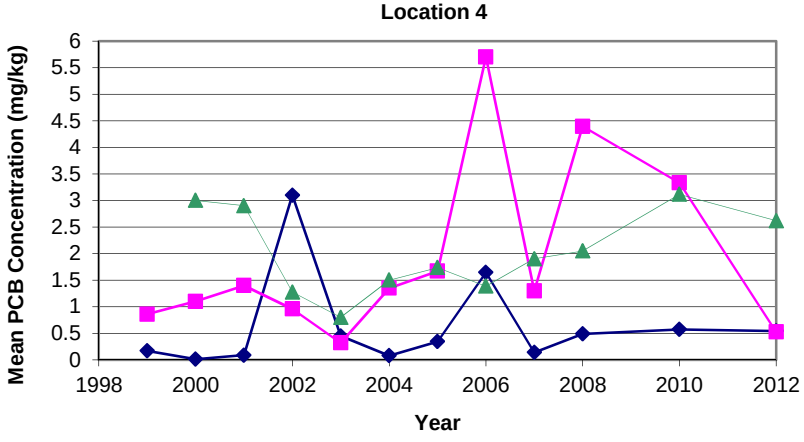
ARCADIS

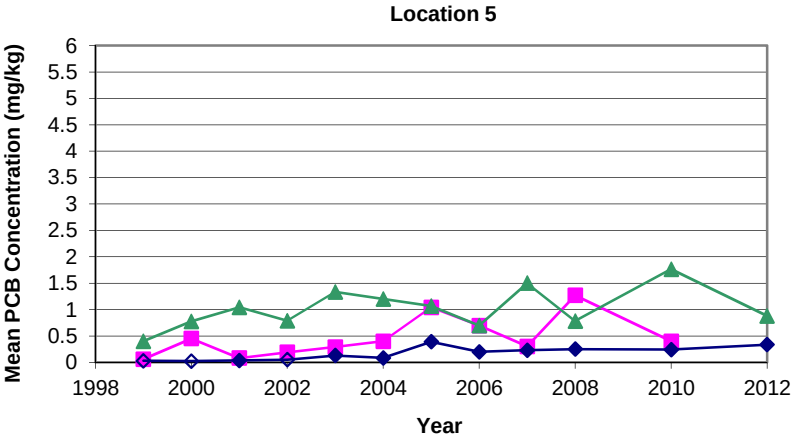
FIGURE 1











Legend:

- Surface Sediment (Detected)
- Surface Sediment (Not Detected)
- Sediment Trap (Detected)
- Sediment Trap (Not Detected)
- Fish Tissue (Arithmetic Mean)

Notes:

1. Locations with observations of all non-detects utilize the sample specific reporting limit to derive an arithmetic mean value.
2. Parent and duplicate sample results are presented as a single value for each location.

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

PCB DATA SUMMARY

ARCADIS

FIGURE
2