A Department of Ecology Report

WASHINGTON STATE DEPARTMENT OF ECOLOGY

American Crossarm & Conduit
January 6-7, September 9-10, and December 9-10, 1997

Abstract

This document summarizes the first year of groundwater and surface water monitoring at the American Crossarm and Conduit (ACC) site. Ecology will be conducting semi-annual sampling at the site for five years, until 2001. The objective of this sampling is to provide the Toxics Cleanup Program with data to evaluate the long-term effectiveness of the cleanup action taken at ACC. Samples were collected on January 6-7 and September 9-10, 1997 from four downgradient monitoring wells (MW-22, MW-23, MW-24, and MW-25) and two on-site surface water stations (ACCSW1 and ACCSW2). All samples were analyzed for polycyclic aromatic hydrocarbons (PAHs) and chlorinated phenolics. Due to a laboratory error, data quality objectives for sample completeness were not met in September, consequently samples for PAH analyses were re-collected on December 9-10, 1997.

In January, low concentrations of several PAHs were detected in the four wells. Concentrations ranged from an estimated value of 0.00094 µg/L to 0.12 µg/L, with most detections near or below the analytical detection limit. In December, only naphthalene (0.01-0.014 µg/L) and acenaphthylene (0.00056J µg/L) were detected in two of the wells. Chlorinated phenolics were not detected in any of the wells during either sampling.

Model Toxic Control Act (MTCA) Method B cleanup standards for groundwater for this project are 0.012 µg/L for PAHs and 0.729 µg/L for pentachlorophenol (PCP). The following table summarizes PAHs that exceeded the established cleanup standard in groundwater.

by Pamela B. Marti
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Waterbody No. WA -23-1020 *(Segment No. 05-12-GW)*

Ecology Report #99-321

Summary of PAHs (µg/L) that exceeded MTCA Method B Cleanup Standards in Groundwater

	MW-22	MW-25	MW-23	MW-24
January 1997				
Naphthalene	0.014 U	0.032	0.12	0.069
Phenanthrene	0.0035 J	0.012	0.039	0.022
2-Methylnapthalene	0.0097 J	0.017 J	0.029	0.007 J
Fluorene	0.0074 U	0.0037 J	0.014	0.0097
Pyrene	0.0074 U	0.0078 U	0.0055 J	0.028
December 1997				
Naphthalene	0.0071 U	0.01	0.014	0.0067 U

(Model Toxic Control Act Method B Cleanup Standard for PAHs in groundwater is 0.012 µg/L)

U = The analyte was not detected at or above the reported value.
J = The analyte was positively identified. The associated numerical result is an estimate.

Several PAHs were detected in both surface water samples during both sample events, with most detections near or below the analytical detection limits. The following table summarizes the range of PAH concentrations and the chlorinated phenolics that were detected at both surface water stations. All detected analytes were far below established water quality criteria for fresh water.

Summary of American Crossarm & Conduit Surface Water Results (µg/L)

	January 1997		*December/September 1997*	
	ACCSW1	*ACCSW2*	*ACCSW1*	*ACCSW2*
PAHs	0.0023J – 0.061	0.00067J – 0.016	0.0012J – 0.4	0.0011J – 0.12
PCP	0.58	0.35	0.007J	0.005J
2,3,4,6-tetrachlorophenpol	0.13	0.071	0.008	0.004

J = The analyte was positively identified. The associated numerical result is an estimate.

Background

ACC of Chehalis, Washington (Figure 1) was added to the National Priorities List in 1988 because of wood preservative product handling and waste disposal practices used during plant operations from the 1940s until 1983. In 1983, an Ecology inspection of ACC determined the facility was not in compliance with waste handling requirements. The facility was composed of four areas that included a wood treatment area, kilns, mill, and a facility landfill. Waste streams from the milling operation consisted of wood waste, cooling water and boiler blowdown. As part of a corrective action Ecology required ACC to eliminate all discharges of wastewater to groundwater and surface water. In late 1983, ACC stopped its wood milling and treatment operation. Soil, surface water,

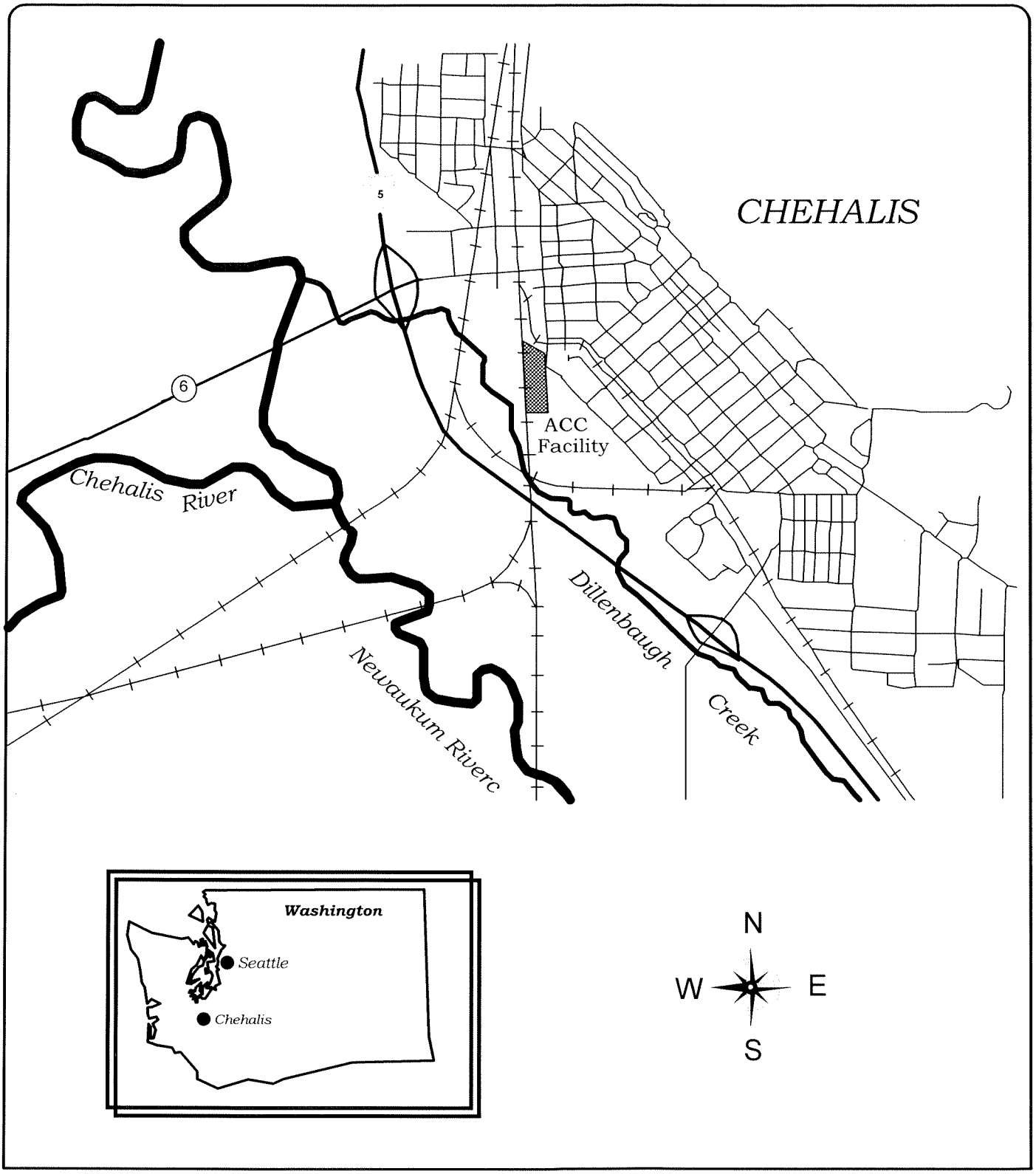

Figure 1: American Crossarm & Conduit Site Location

and groundwater samples collected on- and off-site showed contamination on the ACC facility and areas immediately adjacent, including Dillenbaugh Creek, wetlands and to a lesser degree the Chehalis River. PCP, PAHs, and dioxins/furans were the primary contaminants identified. Remedial action at the ACC site, conducted by the EPA, consisted of:

- The demolition/removal of existing facility structures;
- Removal of the most contaminated soil;
- Consolidation of other contaminated soil on the facility property;
- Incineration of contaminated soil and debris generated from the cleanup;
- Reduction of gross floating product on groundwater beneath the facility; and
- Covering the site with clean soil and vegetation.

After EPA's cleanup activities were completed the operation and maintenance responsibilities for the site were transferred to the Department of Ecology. The performance monitoring described in this memorandum is being conducted at the ACC facility to assess the effectiveness of the remedial action.

Geology of the site as described in the Remedial Investigation report (Weston, 1992) consists of unconsolidated fine-to coarse-grained alluvial and lacustrine deposits overlaying indurated siltstone. Fill material, which is predominately silt or wood chips and bark, has been placed over the alluvium over most of the project area. Groundwater flow beneath ACC occurs primarily in a thin coarse-grained unit sandwiched between overlying silt and clay deposits and the bedrock below. Groundwater occurs at about five feet bgs and flows southwest toward the Chehalis and Newaukum Rivers. The ACC site is within the 100-year floodplain of the Newaukum and Chehalis rivers.

Results

Samples were collected on January 6-7 and September 9-10, 1997 from four downgradient monitoring wells (MW-22, MW-23, MW-24, and MW-25) and two on-site surface water stations (ACCSW1 and ACCSW2) (Figure 2). All samples were analyzed for polycyclic aromatic hydrocarbons (PAHs) and chlorinated phenolics. Due to a laboratory error, data quality objectives for sample completeness were not met in September, consequently samples for PAH analyses were re-collected on December 9-10, 1997. Sampling procedures are discussed in Appendix A.

Field Observations

Table 1 lists field observations for each sample location including well depth, static water level, pH, specific conductance, temperature, and purged volume. All field parameters were within expected ranges.

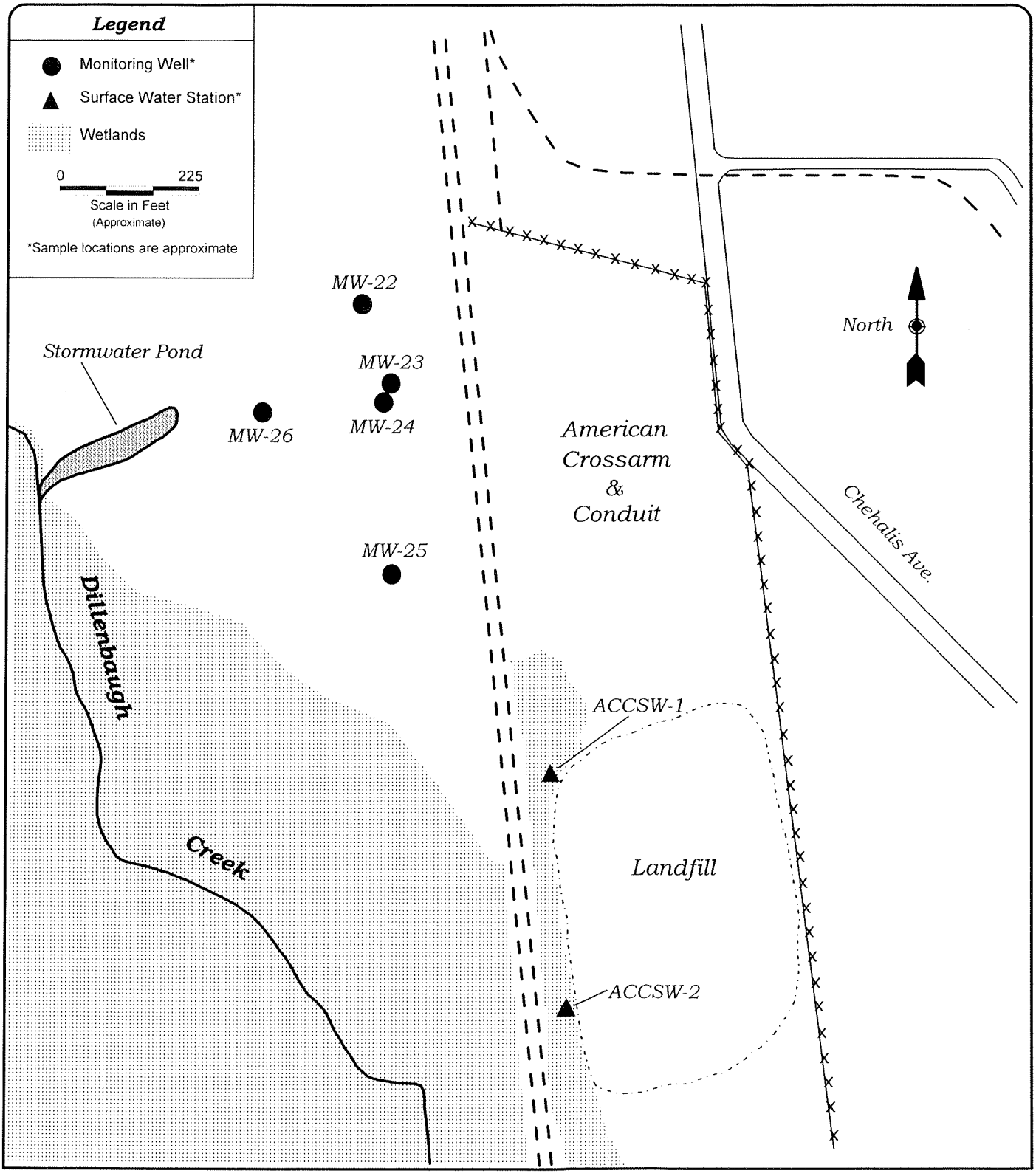

Figure 2: American Crossarm & Conduit Sample Locations

Table 1: Summary of Field Parameters Results for January 1997 to December 1997

	MW-22	MW-25	MW-23	MW-24	ACCSW1	ACCSW2
Total Depth (feet)	35.73	39.85*	35.30*	42.90*	---	---
Measuring Point (feet)	+1.41	+0.97	+1.58	+1.83	---	---
Depth to Water (feet) (from Measuring Point.)	3.05-4.85	1.90-3.70	1.30-3.29	1.95-3.98	---	---
pH (standard units)	6.5-6.8	6.5-6.9	6.4-6.7	6.8-6.9	6.5-7.4	7.0
Specific Conductance (umhos/cm)	520-550	420-440	439-460	460-494	112-385	380
Temperature (°C)	13.8-16.8	14.2-18.6	14.2-17.6	14.0-17.2	4.2-23.1	18.2
Purge Volume (gal)	11-20	5-20	5-18	5-20	---	---

* Approximately 4-inches were removed from these well casings because subsidence of the protective casing was blocking the well tops.

Static water levels in January were high in all the monitoring wells due to a winter storm, which created heavy rains and flooding in the area. The static water level elevation in MW-23 was above the ground surface elevation. Water in MW-23 overflowed the top of the well casing when the well cap was removed. The high static water levels are a function of the hydrogeology of the site. The four sampled wells are screened in coarse-grained silty gravelly sand, the principal water-bearing unit at the site, which is overlain by a thick silty clay unit with low permeability. The silty clay unit probably serves as a semi-confining layer for the water-bearing unit. As a result, pressure changes in response to increased recharge, are transmitted rapidly and over considerable distances which causes well water levels to fluctuate.

Analytical Results

All samples were analyzed for PAHs and chlorinated phenolics. PAHs were analyzed using EPA SW846 Method 8270 by SIM (Select Ion Monitoring) with a method detection limit of about 0.1 µg/L. Chlorinated phenolics were analyzed using EPA SW846 Method 8150 (modified) with a method detection limit of 0.01-1.0 µg/L. Analytical results for all sample events are summarized in Tables 2 and 3. Discussion of quality assurance along with the laboratory reporting sheets is presented in Appendix B.

In January, low concentrations of several PAHs were detected in the four wells. Concentrations ranged from an estimated value of 0.00094 µg/L to 0.12 µg/L, with most detections near or below the analytical detection limit. In December, naphthalene was detected in MW-25 and MW-23 at 0.01 µg/L and 0.014 µg/L, respectively. Acenaphthylene was also detected in MW-23 at an estimated concentration of 0.00056 µg/L. Chlorinated phenolics were not detected in any of the wells during either sampling.

Several PAHs were detected in both surface water samples during both sample events, with most detections near or below the analytical detection limits. Estimated values have been "J"

Table 2: Summary of Analytes Detected (ug/L) at American Crossarm and Conduit on January 1997

Sample Station	MW-22	MW-25	MW-23	MW-24	MW-24A (Duplicate)	ACCSW1	ACCSW2
Polynuclear Aromatic Hydrocarbons							
Naphthalene	0.014 U	**0.032**	**0.12**	**0.069**	**0.043**	**0.061**	**0.015**
2-Methylnaphthalene	**0.0097 J**	**0.017 J**	**0.029**	**0.007 J**	**0.0078 J**	**0.022**	0.0053 U
1-Methylnaphthalene	**0.0038 J**	**0.007 J**	**0.015 J**	**0.0094 J**	**0.0057 J**	**0.031**	**0.0034 J**
2-Chloronaphthalene	0.0074 U	0.0078 U	0.0076 U	0.0077 U	0.0075 U	0.0078 U	0.0078 U
Acenaphthylene	0.0074 U	0.0078 U	**0.0051 J**	0.0077 U	0.0075 U	**0.019**	**0.0057 J**
Acenaphthene	0.0074 U	0.0078 U	**0.0014 J**	0.0077 U	**0.00094 J**	**0.06**	**0.0058 J**
Dibenzofuran	0.0074 U	0.0078 U	0.00095 U	0.0077 U	0.00033 U	**0.021**	**0.0024 J**
Fluorene	0.0074 U	**0.0037 J**	**0.014**	**0.0097**	**0.004 J**	**0.04**	**0.0055 J**
Phenanthrene	**0.0035 J**	**0.012**	**0.039**	**0.022**	**0.0099 J**	**0.03**	**0.0085**
Anthracene	0.0074 U	**0.0023 J**	**0.0032 J**	**0.0037 J**	**0.0028 J**	**0.035**	**0.016**
Fluoranthene	0.0074 U	**0.0012 J**	**0.0068 J**	**0.0055 J**	**0.0021 J**	**0.042**	**0.012**
Pyrene	0.0074 U	0.0078 U	**0.0055 J**	**0.028**	0.0075 U	**0.041**	**0.012**
Retene	0.0074 U	0.0078 U	0.0076 U	0.0077 U	0.0075 U	**0.0062 J**	**0.00086 J**
Benzo(a)anthracene	0.0074 U	0.0078 U	0.0076 U	0.0077 U	0.0075 U	**0.0061 J**	**0.00067 J**
Chrysene	0.0074 U	0.0078 U	**0.0027 J**	**0.0025 J**	0.0075 U	**0.014**	**0.0037 J**
Benzo(b)fluoranthene	0.0074 U	0.0078 U	0.019 U	0.019 U	0.019 U	**0.0071 J**	0.019 U
Benzo(k)fluoranthene	0.0074 U	0.0078 U	0.0076 U	0.0077 U	0.0075 U	0.0078 U	0.0078 U
Benzo(a)pyrene	0.0074 U	0.0078 U	0.0076 U	0.0077 U	0.0075 U	**0.0024 J**	0.0078 U
Indeno(1,2,3-cd)pyrene	0.0074 U	0.0078 U	0.0076 U	0.0077 U	0.0075 U	**0.0023 J**	0.0078 U
Dibenzo(a,h)anthracene	0.018 U	0.02 U	0.019 U	0.019 U	0.019 U	0.02 U	0.019 U
Benzo(ghi)perylene	0.0074 U	0.0078 U	0.0076 U	0.0077 U	0.0075 U	**0.0025 J**	0.0078 U
Chlorinated Phenolics							
2,4,6-Trichlorophenol	0.029 U	0.031 U	0.031 U	0.031 U	0.030 U	0.031 U	0.031 U
2,4,5-Trichlorophenol	0.029 U	0.031 U	0.031 U	0.031 U	0.030 U	0.031 U	0.031 U
2,3,4,6-Tetrachlorophenol	0.029 U	0.031 U	0.031 U	0.031 U	0.030 U	**0.13**	**0.071**
2,3,4,5-Tetrachlorophenol	0.029 U	0.031 U	0.031 U	0.031 U	0.030 U	0.031 U	0.031 U
Pentachlorophenol	0.029 U	0.031 U	0.031 U	0.031 U	0.030 U	**0.58**	**0.35**

U = The analyte was not detected at or above the reported value.

J = The analyte was positively identified. The associated numerical value is an estimate.

Model Toxic Control Act Method B Cleanup Standards for groundwater are 0.012 ug/L for PAHs and 0.729 ug/L for PCP

Table 3: Summary of Analytes Detected (ug/L) at American Crossarm and Conduit on September/December 1997

Sample Station	MW-22	MW-25	MW-23	MW-24	MW-24A (Duplicate)	ACCSW1	ACCSW2
Polynuclear Aromatic Hydrocarbons[1]							
Naphthalene	0.0071 U	**0.01**	**0.014**	0.0067 U	0.0064 U	**0.29**	**0.12**
2-Methylnaphthalene	0.0066 U	0.0063 U	0.0064 U	0.0067 U	0.0064 U	**0.14**	**0.035**
1-Methylnaphthalene	0.0066 U	0.0063 U	0.0064 U	0.0067 U	0.0064 U	**0.16**	**0.043**
2-Chloronaphthalene	0.0066 U	0.0063 U	0.0064 U	0.0067 U	0.0064 U	0.0064 U	0.0065 U
Acenaphthylene	0.0066 U	0.0063 U	**0.00056 J**	0.0067 U	0.0064 U	**0.013**	**0.0053 J**
Acenaphthene	0.0066 U	0.0063 U	0.0064 U	0.0067 U	0.0064 U	**0.4**	**0.11**
Dibenzofuran	0.0066 U	0.0063 U	0.0064 U	0.0067 U	0.0064 U	**0.1**	**0.026**
Fluorene	0.0066 U	0.0063 U	0.0064 U	0.0067 U	0.0064 U	**0.18**	**0.051**
Phenanthrene	0.0066 U	0.0063 U	0.0064 U	0.0067 U	0.0064 U	**0.065**	**0.024**
Anthracene	0.0066 U	0.0063 U	0.0064 U	0.0067 U	0.0064 U	**0.11**	**0.029**
Fluoranthene	0.0066 U	0.0063 U	0.0064 U	0.0067 U	0.0064 U	**0.23**	**0.031**
Pyrene	0.013 U	0.013 U	0.013 U	0.013 U	0.013 U	**0.16**	**0.021**
Retene	0.0066 U	0.0063 U	0.0064 U	0.0067 U	0.0064 U	**0.017**	**0.0024 J**
Benzo(a)anthracene	0.0066 U	0.0063 U	0.0064 U	0.0067 U	0.0064 U	**0.021**	**0.0029 J**
Chrysene	0.0066 U	0.0063 U	0.0064 U	0.0067 U	0.0064 U	**0.031**	**0.0037 J**
Benzo(b)fluoranthene	0.0066 U	0.0063 U	0.0064 U	0.0067 U	0.0064 U	**0.018 J**	**0.0031 J**
Benzo(k)fluoranthene	0.0066 U	0.0063 U	0.0064 U	0.0067 U	0.0064 U	**0.0064 J**	**0.0011 J**
Benzo(a)pyrene	0.0066 U	0.0063 U	0.0064 U	0.0067 U	0.0064 U	**0.013**	**0.0018 J**
Indeno(1,2,3-cd)pyrene	0.0066 U	0.0063 U	0.0064 U	0.0067 U	0.0064 U	**0.0073**	**0.0012 J**
Dibenzo(a,h)anthracene	0.0066 U	0.0063 U	0.0064 U	0.0067 U	0.0064 U	**0.0012 J**	0.0064 U
Benzo(ghi)perylene	0.0066 U	0.0063 U	0.0064 U	0.0067 U	0.0064 U	**0.007**	**0.0016 J**
Chlorinated Phenolics[2]							
2,4,6-Trichlorophenol	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U
2,4,5-Trichlorophenol	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U
2,3,4,6-Tetrachlorophenol	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	**0.008**	**0.004**
2,3,4,5-Tetrachlorophenol	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U
Pentachlorophenol (PCP)	0.003 U	0.003 U	0.003 U	0.003 U	0.003 U	**0.007 J**	**0.005 J**

U = The analyte was not detected at or above the reported value.

J = The analyte was positively identified. The associated numerical value is an estimate.

[1] = PAH results from samples collected in December 1997.

[2] = Chlorinated phenolic results from samples collected in September 1997.

Model Toxic Control Act Method B Cleanup Standards for groundwater are 0.012 ug/L for PAHs and 0.729 ug/L for PCP

qualified. In January, PAH concentrations at ACCSW1 ranged from 0.0023J to 0.061 µg/L and at ACCSW2 from 0.00067J to 0.016 µg/L. December concentrations ranged from 0.0012J to 0.4 µg/L (ACCSW1) and 0.0011J to 0.12 µg/L (ACCSW2). PCP and 2,3,4,6-tetrachlorophenol were also detected at both surface water stations. In January, PCP and 2,3,4,6-tetrachlorophenol concentrations were 0.58 µg/L and 0.13 µg/L in ACCSW1 and 0.35 µg/L and 0.071 µg/L in ACCSW2. September concentrations for the two analytes were 0.007J µg/L and 0.008 µg/L (ACCSW1) and 0.005J µg/L and 0.004 µg/L (ACCSW2).

Discussion

PAHs were analyzed using EPA SW846 Method 8270 by SIM (Select Ion Monitoring) with a method detection limit of about 0.1 µg/L. Chlorinated phenolics were analyzed using EPA SW846 Method 8150 (modified) with a method detection limit of 0.01-1.0 µg/L. The detection limits achieved are generally lower then the stated method detection limit, which will be required for this project to meet the Method B cleanup standards of the Model Toxic Control Act (MTCA). The groundwater Method B cleanup standards for this project are 0.012 µg/L for PAHs and 0.729 µg/L for pentachlorophenol (PCP). The analytical detection limits for all the sample events were below the cleanup standards and are listed in Tables 2 and 3.

In January, five PAHs exceeded the established MTCA Method B cleanup standard of 0.012 µg/L. Table 4 summarizes PAHs that exceeded the established cleanup standard in groundwater.

Table 4. Summary of PAHs (µg/L) that exceeded MTCA Method B Cleanup Standards in Groundwater

	MW-22	MW-25	MW-23	MW-24
January 1997				
Naphthalene	0.014 U	0.032	0.12	0.069
Phenanthrene	0.0035 J	0.012	0.039	0.022
2-Methylnapthalene	0.0097 J	0.017 J	0.029	0.007 J
Fluorene	0.0074 U	0.0037 J	0.014	0.0097
Pyrene	0.0074 U	0.0078 U	0.0055 J	0.028
December 1997				
Naphthalene	0.0071 U	0.01	0.014	0.0067 U

(Model Toxic Control Act Method B Cleanup Standard for PAHs in groundwater is 0.012 µg/L)

U = The analyte was not detected at or above the reported value.
J = The analyte was positively identified. The associated numerical result is an estimate.

Table 5 is a summary of ambient water quality criteria for fresh water established for select PAHs and chlorinated phenolics. All detected analytes in the surface water samples were far below the fresh water quality criteria (EPA, 1992). For comparison, human health criteria for fresh water have also been included in Table 5.

Table 5: Summary of Water Quality and Human Health Criteria for Fresh Water (μg/L)

	Priority Pollutant	*Carcinogen*	*Fresh Acute Criteria*	*Fresh Chronic Criteria*	*Human Health Criteria*
PAHs					
Naphthalene	Y	N	2300	620	
2-Chloronaphthalene	Y	N	1,600		
Acenapthene	Y	N	1,700*	520*	
Fluorene	Y	N			1,300
Anthracene	Y	N			9,600
Fluoranthene	Y	N	3,980		300
Pyrene	Y	N			960
Benzo(a)anthracene	Y	Y			0.0028
Chrysene	Y	Y			0.0028
Benzo(b)fluoranthene	Y	Y			0.0028
Benzo(k)fluoranthene	Y	Y			0.0028
Benzo(a)pyrene	Y	Y			0.0028
Dibenzo(a,h)anthracene	Y	Y			0.0028
Indeno(1,2,3-cd)pyrene	Y	Y			0.0028
Chlorinated Phenolics					
2,4,6-Trichlorophenol	Y	Y		970	2.10
2,4,5-Trichlorophenal	N	N			
Pentachlorophenol (for a pH of 6.5)	Y	Y	5.49	3.46	0.28

* Insufficient data to develop criteria value.

(EPA. 1992. Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants; State Compliance Final Rule.)

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Appendix A

Sampling Methods

Groundwater and surface water samples were collected on January 6-7; September 9-10; and December 9-10, 1997. Samples were collected from downgradient wells MW-22, MW-23, MW-24 and MW-25 and two on-site surface water stations, ACCSW1 and ACCSW2 (Figure 2).

The four monitoring wells were sampled using standard sampling techniques. Prior to sample collection, static water level measurements were recorded to 0.01 feet using an electronic water level probe. The probe was rinsed with deionized water after each use. In January, all wells were purged, using a submersible pump at a flow rate of about 1.5-gpm, a minimum of three well volumes and until pH, temperature and specific conductance readings stabilized (changes of 10% or less between measurements). Samples were collected using decontaminated teflon bailers. The bailers were pre-cleaned with a Liquinox® wash and sequential rinses of hot tap water, 10% nitric acid, distilled/deionized water, and pesticide-grade acetone. After cleaning, all bailers were air-dried and wrapped in aluminum foil. In September, all wells were purged and sampled using a peristaltic pump. The pump rate was set at about 0.05-gpm. Samples were collected when field parameters had stabilized. In December, all wells were purged and sampled using a stainless steel submersible pump with a pump rate of about 0.5-gpm. Samples were collected when field parameters had stabilized. The pump was decontaminated between wells by circulating laboratory grade detergent/water through the pump for 5-minutes, followed by a clean water rinse. Purge water was discharged to the ground near each well. All samples for PAHs and chlorinated phenolics were collected in 1-gallon jars with teflon lined lids.

Two surface water samples were collected to determine if on-site wetlands are receiving any contaminants from the former facility. The samples were collected from two areas considered representative of the site. The first sample location was at the outlet of a small seasonal pond which received surface runoff from the north half of the site. The second sample location was at a wetland area at the south end of the site, adjacent to the landfill. This station should represent runoff from most of the site, which would include possible leachate from the landfill. Surface water samples were collected using decontaminated stainless steel beakers, and transferred to 1-gallon sample jars. The surface water was assumed to be fully mixed and the sample collected at mid-depth and as close to the center of flowing water as could be reached from the bank. Temperature, pH, and specific conductance were measured at the time each sample was collected.

Upon sample collection and proper labeling, samples were stored in an ice-filled cooler. Chain-of-custody procedures were followed in accordance with Manchester Laboratory protocol (Ecology, 1994).

Appendix B

Quality Assurance Samples

In general, the quality of the data is acceptable for use for all sample rounds. Quality control samples collected in the field consisted of blind duplicate samples. Blind duplicate samples were collected from well MW-24A for each sample event. Duplicate samples provide an estimate of combined sampling and laboratory precision. The numeric comparison of duplicate results is expressed as the relative percent difference or RPD. RPDs are the ratio of the difference and the mean of the duplicate results expressed as a percentage. RPDs for the January PAH results have not been calculated due to the low concentrations that were detected which are often not representative of the overall precision. No analytes were detected in the September/December duplicate samples, therefore RPDs can not be calculated.

In addition to field quality control samples; laboratory blanks, fortified laboratory blanks and surrogate compound recoveries, were performed in the laboratory. Due to the low detection levels achieved with the SIM mode analysis for PAHs, low levels of some target compounds were detected in the laboratory blanks. The laboratory reported to me that due to laboratory procedures the detected results in the samples are real and do not require qualification even though the target analytes were detected in the laboratory blanks. Fortified laboratory blanks were analyzed in place of matrix spikes. Overall, fortified laboratory blank results and surrogate compound recoveries were within acceptable limits.

MANCHESTER ENVIRONMENTAL LABORATORY

7411 Beach Drive E , Port Orchard Washington 98366

CASE NARRATIVE

March 7, 1997

Subject: American Crossarm ACC

Samples: 97-028080 to -028086

Case No. 1008 -97

Officer: Pam Marti

By: Dickey D. Huntamer
Organics Analysis Unit

SEMIVOLATILE ORGANICS
Polynuclear Aromatic Hydrocarbons

ANALYTICAL METHODS:

The semivolatile water samples were extracted with methylene chloride for low level Single Ion Monitoring (SIM) following the Manchester modification of the EPA SW 846 8270 procedure with capillary GC/MS SIM analysis of the sample extracts. Normal QA/QC procedures were performed with the analyses except for matrix spikes. Two fortified laboratory blanks were analyzed with the samples. These are identified as BLN70438 and BLN70439.

HOLDING TIMES:

All sample and extraction holding times were within the recommended limits.

BLANKS:

Due to the low detection levels achievable in the SIM mode analysis, low levels of some target compounds are often detected in the laboratory blanks. The EPA five times rule was applied to all target compounds which were found in the blank. Compounds that were found in the sample and in the blank were considered real and not the result of contamination if the levels in the sample are greater than or equal to five times the amount of compounds in the associated method blank.

SURROGATES:

The normal SIM mode surrogate compounds were added to the sample prior to extraction. The primary surrogates for PAH analyses are pyrene-d10 and terphenyl-d14. Their surrogate spike recoveries were within acceptable QC limits.

MATRIX SPIKE AND MATRIX SPIKE DUPLICATE:

No matrix spikes were analyzed with these samples. A pair of fortified laboratory blanks was analyzed and recoveries ranged from 61% to 132%. The recommended limits are 75% to 125%. All Relative Percent Differences (RPD) were acceptable except for pyrene at 42% (2% above the recommended limit of 40%). Since these were fortified laboratory blanks and not matrix spike samples no qualifiers were added to the data.

ANALYTICAL COMMENTS:

No special analytical problems were encountered in the polynuclear aromatic hydrocarbon analyses. The data is acceptable for use as reported.

Naphthalene in sample, -028080 was qualified "UJ" since the amount detected was less than five times the amounts detected in the laboratory blanks.

DATA QUALIFIER CODES:

U	-	The analyte was not detected at or above the reported value.
J	-	The analyte was positively identified. The associated numerical value is an estimate.
UJ	-	The analyte was not detected at or above the reported estimated result.
REJ	-	The data are unusable for all purposes.
EXP	-	The result is equal to the number before EXP times 10 to the power of the number after EXP. As an example 3EXP6 equals 3×10^6.
NAF	-	Not analyzed for.
N	-	For organic analytes there is evidence the analyte is present in this sample.
NJ	-	There is evidence that the analyte is present. The associated numerical result is an estimate.
E	-	This qualifier is used when the concentration of the associated value exceeds the known calibration range.
bold	-	The analyte was present in the sample. (Visual Aid to locate detected compound on report sheet.)

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Polyaromatic Hydrocarbons (PNA's)

Project Name: American Crossarm ACC **LIMS Project ID:** 1008-97

Sample: 97028080 **Date Received:** 01/08/97 **Method:** SW8270
Field ID: MW-22 **Date Prepared:** 01/10/97 **Matrix:** Water
Project Officer: Pam Marti **Date Analyzed:** 02/13/97 **Units:** ug/L

Analyte	Result	Qualifier
Naphthalene	.014	UJ
2-Methylnaphthalene	**.0097**	**J**
1-Methylnaphthalene	**.0038**	**J**
2-Chloronaphthalene	.0074	U
Acenaphthylene	.0074	U
Acenaphthene	.0074	U
Dibenzofuran	.0074	U
Fluorene	.0074	U
Phenanthrene	**.0035**	**J**
Anthracene	.0074	U
Fluoranthene	.0074	U
Pyrene	.0074	U
Retene	.0074	U
Benzo(a)anthracene	.0074	U
Chrysene	.0074	U
Benzo(b)fluoranthene	.0074	U
Benzo(k)fluoranthene	.0074	U
Benzo(a)pyrene	.0074	U
Indeno(1,2,3-cd)pyrene	.0074	U
Dibenzo(a,h)anthracene	.018	U
Benzo(ghi)perylene	.0074	U

Surrogate Recoveries

2-Fluorobiphenyl	**77**	**%**
D10-Pyrene	**87**	**%**
D14-Terphenyl	**98**	**%**

Authorized By: D. Hopkins Release Date: 3/7/97 Page: 1

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Polyaromatic Hydrocarbons (PNA's)

Project Name: American Crossarm ACC **LIMS Project ID:** 1008-97

Sample: 97028081 **Date Received:** 01/08/97 **Method:** SW8270
Field ID: MW-25 **Date Prepared:** 01/10/97 **Matrix:** Water
Project Officer: Pam Marti **Date Analyzed:** 02/13/97 **Units:** ug/L

Analyte	Result	Qualifier
Naphthalene	**.032**	
2-Methylnaphthalene	**.017**	**J**
1-Methylnaphthalene	**.007**	**J**
2-Chloronaphthalene	.0078	U
Acenaphthylene	.0078	U
Acenaphthene	.0078	U
Dibenzofuran	.00041	UJ
Fluorene	**.0037**	**J**
Phenanthrene	**.012**	
Anthracene	**.0023**	**J**
Fluoranthene	**.0012**	**J**
Pyrene	.0078	U
Retene	.0078	U
Benzo(a)anthracene	.0078	U
Chrysene	.0078	U
Benzo(b)fluoranthene	.0078	U
Benzo(k)fluoranthene	.0078	U
Benzo(a)pyrene	.0078	U
Indeno(1,2,3-cd)pyrene	.0078	U
Dibenzo(a,h)anthracene	.02	U
Benzo(ghi)perylene	.0078	U

Surrogate Recoveries

2-Fluorobiphenyl	**86**	**%**
D10-Pyrene	**89**	**%**
D14-Terphenyl	**91**	**%**

Authorized By: D. X [illegible] Release Date: 3/6/97 Page: 1

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Polyaromatic Hydrocarbons (PNA's)

Project Name: American Crossarm ACC **LIMS Project ID:** 1008-97

Sample: 97028082 **Date Received:** 01/08/97 **Method:** SW8270
Field ID: ACCSW1 **Date Prepared:** 01/10/97 **Matrix:** Water
Project Officer: Pam Marti **Date Analyzed:** 02/13/97 **Units:** ug/L

Analyte	Result	Qualifier
Naphthalene	**.061**	
2-Methylnaphthalene	**.022**	
1-Methylnaphthalene	**.031**	
2-Chloronaphthalene	.0078	U
Acenaphthylene	**.019**	
Acenaphthene	**.06**	
Dibenzofuran	**.021**	
Fluorene	**.04**	
Phenanthrene	**.03**	
Anthracene	**.035**	
Fluoranthene	**.042**	
Pyrene	**.041**	
Retene	**.0062**	**J**
Benzo(a)anthracene	**.0061**	**J**
Chrysene	**.014**	
Benzo(b)fluoranthene	**.0071**	**J**
Benzo(k)fluoranthene	.0078	U
Benzo(a)pyrene	**.0024**	**J**
Indeno(1,2,3-cd)pyrene	**.0023**	**J**
Dibenzo(a,h)anthracene	.02	U
Benzo(ghi)perylene	**.0025**	**J**

Surrogate Recoveries

2-Fluorobiphenyl	**93**	**%**
D10-Pyrene	**97**	**%**
D14-Terphenyl	**94**	**%**

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Polyaromatic Hydrocarbons (PNA's)

Project Name: American Crossarm ACC **LIMS Project ID:** 1008-97

Sample: 97028083 **Date Received:** 01/08/97 **Method:** SW8270
Field ID: ACCSW2 **Date Prepared:** 01/10/97 **Matrix:** Water
Project Officer: Pam Marti **Date Analyzed:** 02/13/97 **Units:** ug/L

Analyte	Result	Qualifier
Naphthalene	**.015**	
2-Methylnaphthalene	.0053	UJ
1-Methylnaphthalene	**.0034**	**J**
2-Chloronaphthalene	.0078	U
Acenaphthylene	**.0057**	**J**
Acenaphthene	**.0058**	**J**
Dibenzofuran	**.0024**	**J**
Fluorene	**.0055**	**J**
Phenanthrene	**.0085**	
Anthracene	**.016**	
Fluoranthene	**.012**	
Pyrene	**.012**	
Retene	**.00086**	**J**
Benzo(a)anthracene	**.00067**	**J**
Chrysene	**.0037**	**J**
Benzo(b)fluoranthene	.019	U
Benzo(k)fluoranthene	.0078	U
Benzo(a)pyrene	.0078	U
Indeno(1,2,3-cd)pyrene	.0078	U
Dibenzo(a,h)anthracene	.019	U
Benzo(ghi)perylene	.0078	U

Surrogate Recoveries

2-Fluorobiphenyl	**89**	**%**
D10-Pyrene	**93**	**%**
D14-Terphenyl	**93**	**%**

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Polyaromatic Hydrocarbons (PNA's)

Project Name: American Crossarm ACC **LIMS Project ID:** 1008-97

Sample: 97028084 **Date Received:** 01/08/97 **Method:** SW8270
Field ID: MW-23 **Date Prepared:** 01/10/97 **Matrix:** Water
Project Officer: Pam Marti **Date Analyzed:** 02/13/97 **Units:** ug/L

Analyte	Result	Qualifier
Naphthalene	**.12**	
2-Methylnaphthalene	**.029**	
1-Methylnaphthalene	**.015**	**J**
2-Chloronaphthalene	.0076	U
Acenaphthylene	**.0051**	**J**
Acenaphthene	**.0014**	**J**
Dibenzofuran	.00095	UJ
Fluorene	**.014**	
Phenanthrene	**.039**	
Anthracene	**.0032**	**J**
Fluoranthene	**.0068**	**J**
Pyrene	**.0055**	**J**
Retene	.0076	U
Benzo(a)anthracene	.0076	U
Chrysene	**.0027**	**J**
Benzo(b)fluoranthene	.019	U
Benzo(k)fluoranthene	.0076	U
Benzo(a)pyrene	.0076	U
Indeno(1,2,3-cd)pyrene	.0076	U
Dibenzo(a,h)anthracene	.019	U
Benzo(ghi)perylene	.0076	U

Surrogate Recoveries

2-Fluorobiphenyl	**98**	**%**
D10-Pyrene	**87**	**%**
D14-Terphenyl	**95**	**%**

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Polyaromatic Hydrocarbons (PNA's)

Project Name: American Crossarm ACC **LIMS Project ID:** 1008-97

Sample: 97028085 **Date Received:** 01/08/97 **Method:** SW8270
Field ID: MW-24 **Date Prepared:** 01/10/97 **Matrix:** Water
Project Officer: Pam Marti **Date Analyzed:** 02/13/97 **Units:** ug/L

Analyte	Result	Qualifier
Naphthalene	**.069**	
2-Methylnaphthalene	**.007**	**J**
1-Methylnaphthalene	**.0094**	**J**
2-Chloronaphthalene	.0077	U
Acenaphthylene	.0077	U
Acenaphthene	.0077	U
Dibenzofuran	.0077	U
Fluorene	**.0097**	
Phenanthrene	**.022**	
Anthracene	**.0037**	**J**
Fluoranthene	**.0055**	**J**
Pyrene	**.028**	
Retene	.0077	U
Benzo(a)anthracene	.0077	U
Chrysene	**.0025**	**J**
Benzo(b)fluoranthene	.019	U
Benzo(k)fluoranthene	.0077	U
Benzo(a)pyrene	.0077	U
Indeno(1,2,3-cd)pyrene	.0077	U
Dibenzo(a,h)anthracene	.019	U
Benzo(ghi)perylene	.0077	U

Surrogate Recoveries

2-Fluorobiphenyl	**85**	**%**
D10-Pyrene	**90**	**%**
D14-Terphenyl	**96**	**%**

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Polyaromatic Hydrocarbons (PNA's)

Project Name: American Crossarm ACC **LIMS Project ID:** 1008-97

Sample: 97028086 **Date Received:** 01/08/97 **Method:** SW8270
Field ID: MW-24A **Date Prepared:** 01/10/97 **Matrix:** Water
Project Officer: Pam Marti **Date Analyzed:** 02/13/97 **Units:** ug/L

Analyte	Result	Qualifier
Naphthalene	**.043**	
2-Methylnaphthalene	**.0078**	**J**
1-Methylnaphthalene	**.0057**	**J**
2-Chloronaphthalene	.0075	U
Acenaphthylene	.0075	U
Acenaphthene	**.00094**	**J**
Dibenzofuran	.00033	UJ
Fluorene	**.004**	**J**
Phenanthrene	**.0099**	
Anthracene	**.0028**	**J**
Fluoranthene	**.0021**	**J**
Pyrene	.0075	U
Retene	.0075	U
Benzo(a)anthracene	.0075	U
Chrysene	.0075	U
Benzo(b)fluoranthene	.019	U
Benzo(k)fluoranthene	.0075	U
Benzo(a)pyrene	.0075	U
Indeno(1,2,3-cd)pyrene	.0075	U
Dibenzo(a,h)anthracene	.019	U
Benzo(ghi)perylene	.0075	U

Surrogate Recoveries

2-Fluorobiphenyl	**76**	**%**
D10-Pyrene	**97**	**%**
D14-Terphenyl	**99**	**%**

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Polyaromatic Hydrocarbons (PNA's)

Project Name: American Crossarm ACC **LIMS Project ID:** 1008-97

Sample: BLN70395 **Method:** SW8270
Blank ID: OBW7010A1 **Date Prepared:** 01/10/97 **Matrix:** Water
Project Officer: Pam Marti **Date Analyzed:** 02/13/97 **Units:** ug/L

Analyte	Result	Qualifier
Naphthalene	**.016**	
2-Methylnaphthalene	**.0049**	**J**
1-Methylnaphthalene	.062	U
2-Chloronaphthalene	.025	U
Acenaphthylene	.025	U
Acenaphthene	**.0017**	**J**
Dibenzofuran	**.001**	**J**
Fluorene	**.00023**	**J**
Phenanthrene	**.00039**	**J**
Anthracene	**.0039**	**J**
Fluoranthene	**.0011**	**J**
Pyrene	.025	U
Retene	.025	U
Benzo(a)anthracene	.025	U
Chrysene	.025	U
Benzo(b)fluoranthene	.062	U
Benzo(k)fluoranthene	.025	U
Benzo(a)pyrene	.025	U
Indeno(1,2,3-cd)pyrene	.025	U
Dibenzo(a,h)anthracene	.062	U
Benzo(ghi)perylene	.025	U

Surrogate Recoveries

2-Fluorobiphenyl	**63**	**%**
D10-Pyrene	**104**	**%**
D14-Terphenyl	**108**	**%**

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Polyaromatic Hydrocarbons (PNA's)

Project Name: American Crossarm ACC **LIMS Project ID:** 1008-97

Sample: BLN70396 **Method:** SW8270
Blank ID: OBW7010A2 **Date Prepared:** 01/10/97 **Matrix:** Water
Project Officer: Pam Marti **Date Analyzed:** 02/13/97 **Units:** ug/L

Analyte	Result	Qualifier
Naphthalene	**.015**	
2-Methylnaphthalene	**.0035**	**J**
1-Methylnaphthalene	.062	U
2-Chloronaphthalene	.025	U
Acenaphthylene	.025	U
Acenaphthene	.025	U
Dibenzofuran	.025	U
Fluorene	.025	U
Phenanthrene	.025	U
Anthracene	.025	U
Fluoranthene	**.0026**	**J**
Pyrene	**.00058**	**J**
Retene	.025	U
Benzo(a)anthracene	.025	U
Chrysene	**.00034**	**J**
Benzo(b)fluoranthene	.062	U
Benzo(k)fluoranthene	.025	U
Benzo(a)pyrene	.025	U
Indeno(1,2,3-cd)pyrene	.025	U
Dibenzo(a,h)anthracene	.062	U
Benzo(ghi)perylene	.025	U

Surrogate Recoveries

2-Fluorobiphenyl	**68**	**%**
D10-Pyrene	**96**	**%**
D14-Terphenyl	**100**	**%**

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Polyaromatic Hydrocarbons (PNA's)

Project Name: American Crossarm ACC **LIMS Project ID:** 1008-97

Sample: BLN70438 **Method:** SW8270
Blank ID: OB7010A1 **Date Prepared:** 01/10/97 **Matrix:** Water
Project Officer: Pam Marti **Date Analyzed:** 02/13/97 **Units:** ug/L

Analyte	Result	Qualifier
Naphthalene	**61**	%
2-Methylnaphthalene	**79**	%
1-Methylnaphthalene		NAF
2-Chloronaphthalene	**61**	%
Acenaphthylene	**72**	%
Acenaphthene	**70**	%
Dibenzofuran	**75**	%
Fluorene	**72**	%
Phenanthrene	**82**	%
Anthracene	**74**	%
Carbazole		NAF
Fluoranthene	**89**	%
Pyrene	**133**	%
Retene		NAF
Benzo(a)anthracene	**83**	%
Chrysene	**78**	%
Benzo(b)fluoranthene	**87**	%
Benzo(k)fluoranthene	**77**	%
Benzo(a)pyrene	**79**	%
Indeno(1,2,3-cd)pyrene	**71**	%
Dibenzo(a,h)anthracene	**66**	%
Benzo(ghi)perylene	**72**	%

Surrogate Recoveries

2-Fluorophenol		**NAF**
D5-Phenol		**NAF**
D4-2-Chlorophenol		**NAF**
1,2-Dichlorobenzene-D4		**NAF**
D5-Nitrobenzene		**NAF**
2-Fluorobiphenyl	**56**	%
D10-Pyrene	**79**	%
D14-Terphenyl	**86**	%

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Polyaromatic Hydrocarbons (PNA's)

Project Name: American Crossarm ACC **LIMS Project ID:** 1008-97

Sample: BLN70439 **Method:** SW8270
Blank ID: OB7010A2 **Date Prepared:** 01/10/97 **Matrix:** Water
Project Officer: Pam Marti **Date Analyzed:** 02/13/97 **Units:** ug/L

Analyte	Result	Qualifier
Naphthalene	**64**	%
2-Methylnaphthalene	**76**	%
1-Methylnaphthalene		NAF
2-Chloronaphthalene	**64**	%
Acenaphthylene	**75**	%
Acenaphthene	**72**	%
Dibenzofuran	**78**	%
Fluorene	**76**	%
Phenanthrene	**84**	%
Anthracene	**75**	%
Carbazole		NAF
Fluoranthene	**85**	%
Pyrene	**87**	%
Retene		NAF
Benzo(a)anthracene	**82**	%
Chrysene	**82**	%
Benzo(b)fluoranthene	**91**	%
Benzo(k)fluoranthene	**80**	%
Benzo(a)pyrene	**82**	%
Indeno(1,2,3-cd)pyrene	**72**	%
Dibenzo(a,h)anthracene	**68**	%
Benzo(ghi)perylene	**77**	%

Surrogate Recoveries

2-Fluorophenol		**NAF**
D5-Phenol		**NAF**
D4-2-Chlorophenol		**NAF**
1,2-Dichlorobenzene-D4		**NAF**
D5-Nitrobenzene		**NAF**
2-Fluorobiphenyl	**65**	%
D10-Pyrene	**81**	%
D14-Terphenyl	**87**	%

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MANCHESTER ENVIRONMENTAL LABORATORY

7411 Beach Drive E , Port Orchard Washington 98366

CASE NARRATIVE

January 27, 1997

Subject: American Crossarm ACC

Samples: 97-028080 - 028086

Case No. 1008 -96

Officer: Pam Marti

By: Dickey D. Huntamer DDH
Organics Analysis Unit

CHLORINATED HERBICIDES
Pentachlorophenol

ANALYTICAL METHODS:

Extraction was accomplished using methylene chloride Manchester Lab modified EPA Method 1658. The extracts were derivitized with diazomethane and analyzed using dual column capillary GC and Electron Capture Detectors.

HOLDING TIMES:

All sample extraction and analysis holding times were met.

BLANKS:

No target compounds were detected in the laboratory blanks.

SURROGATES:

No recovery limits have been established for this method. Surrogate recoveries ranged from 77% to 102%. No qualifiers were added due to surrogate recoveries.

MATRIX SPIKE AND MATRIX SPIKE :

No matrix spikes were analyzed with these samples. Two fortified laboratory blanks were analyzed using deionized water. Recoveries for pentachlorophenol were 86% and 89% with an RPD of 3.4%. .

ANALYTICAL COMMENTS:

There were no significant problems with the pentachlorophenol analysis. The results reported for 2,3,4,6 tetrachlorophenol may also include 2,3,5, 6 tetrachlorophenol since these two compounds coelute.

DATA QUALIFIER CODES:

U	-	The analyte was not detected at or above the reported value.
J	-	The analyte was positively identified. The associated numerical value is an estimate.
UJ	-	The analyte was not detected at or above the reported estimated result.
REJ	-	The data are unusable for all purposes.
EXP	-	The result is equal to the number before EXP times 10 to the power of the number after EXP. As an example 3EXP6 equals 3×10^6.
NAF	-	Not analyzed for.
N	-	For organic analytes there is evidence the analyte is present in this sample.
NJ	-	There is evidence that the analyte is present. The associated numerical result is an estimate.
E	-	This qualifier is used when the concentration of the associated value exceeds the known calibration range.
bold	-	The analyte was present in the sample. (Visual Aid to locate detected compound on report sheet.)

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Chlorophenoxy Herbicides

Project Name: American Crossarm ACC **LIMS Project ID:** 1008-97

Sample: 97028080 **Date Received:** 01/08/97 **Method:** SW8150
Field ID: MW-22 **Date Prepared:** 01/10/97 **Matrix:** Water
Project Officer: Pam Marti **Date Analyzed:** 01/15/97 **Units:** ug/L

Analyte	Result	Qualifier
2,4,6-Trichlorophenol	0.029	U
2,4,5-Trichlorophenol	0.029	U
2,3,4,6-Tetrachlorophenol	0.029	U
2,3,4,5-Tetrachlorophenol	0.029	U
Pentachlorophenol	0.029	U

Surrogate Recoveries

2,4,6-Tribromophenol	**88**	**%**

Authorized By: _____ Release Date: 1/27/97 Page: 1

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Chlorophenoxy Herbicides

Project Name: American Crossarm ACC **LIMS Project ID:** 1008-97

Sample: 97028081 **Date Received:** 01/08/97 **Method:** SW8150
Field ID: MW-25 **Date Prepared:** 01/10/97 **Matrix:** Water
Project Officer: Pam Marti **Date Analyzed:** 01/15/97 **Units:** ug/L

Analyte	Result	Qualifier
2,4,6-Trichlorophenol	0.031	U
2,4,5-Trichlorophenol	0.031	U
2,3,4,6-Tetrachlorophenol	0.031	U
2,3,4,5-Tetrachlorophenol	0.031	U
Pentachlorophenol	0.031	U

Surrogate Recoveries

2,4,6-Tribromophenol	**88**	**%**

Authorized By: D-Hanton Release Date: 1/27/97 Page: 1

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Chlorophenoxy Herbicides

Project Name: American Crossarm ACC **LIMS Project ID:** 1008-97

Sample: 97028082 **Date Received:** 01/08/97 **Method:** SW8150
Field ID: ACCSW1 **Date Prepared:** 01/10/97 **Matrix:** Water
Project Officer: Pam Marti **Date Analyzed:** 01/15/97 **Units:** ug/L

Analyte	Result	Qualifier
2,4,6-Trichlorophenol	0.031	U
2,4,5-Trichlorophenol	0.031	U
2,3,4,6-Tetrachlorophenol	**0.13**	
2,3,4,5-Tetrachlorophenol	0.031	U
Pentachlorophenol	**0.58**	

Surrogate Recoveries

2,4,6-Tribromophenol	**85**	**%**

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Chlorophenoxy Herbicides

Project Name: American Crossarm ACC **LIMS Project ID:** 1008-97

Sample: 97028083 **Date Received:** 01/08/97 **Method:** SW8150
Field ID: ACCSW2 **Date Prepared:** 01/10/97 **Matrix:** Water
Project Officer: Pam Marti **Date Analyzed:** 01/15/97 **Units:** ug/L

Analyte	Result	Qualifier
2,4,6-Trichlorophenol	0.031	U
2,4,5-Trichlorophenol	0.031	U
2,3,4,6-Tetrachlorophenol	**0.071**	
2,3,4,5-Tetrachlorophenol	0.031	U
Pentachlorophenol	**0.35**	

Surrogate Recoveries

2,4,6-Tribromophenol	**89**	**%**

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Chlorophenoxy Herbicides

Project Name: American Crossarm ACC **LIMS Project ID:** 1008-97

Sample: 97028084 **Date Received:** 01/08/97 **Method:** SW8150
Field ID: MW-23 **Date Prepared:** 01/10/97 **Matrix:** Water
Project Officer: Pam Marti **Date Analyzed:** 01/15/97 **Units:** ug/L

Analyte	Result	Qualifier
2,4,6-Trichlorophenol	0.031	U
2,4,5-Trichlorophenol	0.031	U
2,3,4,6-Tetrachlorophenol	0.031	U
2,3,4,5-Tetrachlorophenol	0.031	U
Pentachlorophenol	0.031	U

Surrogate Recoveries

2,4,6-Tribromophenol	**100**	**%**

Authorized By: D. [illegible] Release Date: 1/27/97

Manchester Environmental Laboratory

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Analysis Report for

Chlorophenoxy Herbicides

Project Name: American Crossarm ACC **LIMS Project ID:** 1008-97

Sample: 97028085 **Date Received:** 01/08/97 **Method:** SW8150
Field ID: MW-24 **Date Prepared:** 01/10/97 **Matrix:** Water
Project Officer: Pam Marti **Date Analyzed:** 01/15/97 **Units:** ug/L

Analyte	Result	Qualifier
2,4,6-Trichlorophenol	0.031	U
2,4,5-Trichlorophenol	0.031	U
2,3,4,6-Tetrachlorophenol	0.031	U
2,3,4,5-Tetrachlorophenol	0.031	U
Pentachlorophenol	0.031	U

Surrogate Recoveries

2,4,6-Tribromophenol	**89**	**%**

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Manchester Environmental Laboratory

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Analysis Report for

Chlorophenoxy Herbicides

Project Name: American Crossarm ACC **LIMS Project ID:** 1008-97

Sample: 97028086 **Date Received:** 01/08/97 **Method:** SW8150
Field ID: MW-24A **Date Prepared:** 01/10/97 **Matrix:** Water
Project Officer: Pam Marti **Date Analyzed:** 01/15/97 **Units:** ug/L

Analyte	Result	Qualifier
2,4,6-Trichlorophenol	0.030	U
2,4,5-Trichlorophenol	0.030	U
2,3,4,6-Tetrachlorophenol	0.030	U
2,3,4,5-Tetrachlorophenol	0.030	U
Pentachlorophenol	0.030	U

Surrogate Recoveries

2,4,6-Tribromophenol	**101**	**%**

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Analysis Report for

Chlorophenoxy Herbicides

Project Name: American Crossarm ACC **LIMS Project ID:** 1008-97

Sample: BLN70100 **Method:** SW8150
Blank ID: OBW7010A1 **Date Prepared:** 01/10/97 **Matrix:** Water
Project Officer: Pam Marti **Date Analyzed:** 01/15/97 **Units:** ug/L

Analyte	Result	Qualifier
2,4,6-Trichlorophenol	0.033	U
2,4,5-Trichlorophenol	0.033	U
2,3,4,6-Tetrachlorophenol	0.033	U
2,3,4,5-Tetrachlorophenol	0.033	U
Pentachlorophenol	0.033	U

Surrogate Recoveries

2,4,6-Tribromophenol	**102**	**%**

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Analysis Report for

Chlorophenoxy Herbicides

Project Name: American Crossarm ACC **LIMS Project ID:** 1008-97

Sample: BLN70101 **Method:** SW8150
Blank ID: OBW7010A2 **Date Prepared:** 01/10/97 **Matrix:** Water
Project Officer: Pam Marti **Date Analyzed:** 01/15/97 **Units:** ug/L

Analyte	Result	Qualifier
2,4,6-Trichlorophenol	0.033	U
2,4,5-Trichlorophenol	0.033	U
2,3,4,6-Tetrachlorophenol	0.033	U
2,3,4,5-Tetrachlorophenol	0.033	U
Pentachlorophenol	0.033	U

Surrogate Recoveries

2,4,6-Tribromophenol	**94**	**%**

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Analysis Report for

Chlorophenoxy Herbicides

Project Name: American Crossarm ACC **LIMS Project ID:** 1008-97

Sample: LCS70102 **Method:** SW8150
Blank ID: OBF7010A1 **Date Prepared:** 01/10/97 **Matrix:** Water
Project Officer: Pam Marti **Date Analyzed:** 01/15/97 **Units:** ug/L

Analyte	Result	Qualifier
2,4,6-Trichlorophenol	**78**	**%**
2,4,5-Trichlorophenol	**70**	**%**
2,3,4,6-Tetrachlorophenol		NAF
2,3,4,5-Tetrachlorophenol		NAF
Pentachlorophenol	**86**	**%**
Surrogate Recoveries		
2,4,6-Tribromophenol	**77**	**%**

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Analysis Report for

Chlorophenoxy Herbicides

Project Name: American Crossarm ACC **LIMS Project ID:** 1008-97

Sample: LCS70103 **Method:** SW8150
Blank ID: OBF7010A2 **Date Prepared:** 01/10/97 **Matrix:** Water
Project Officer: Pam Marti **Date Analyzed:** 01/15/97 **Units:** ug/L

Analyte	Result	Qualifier
2,4,6-Trichlorophenol	**82**	%
2,4,5-Trichlorophenol	**73**	%
2,3,4,6-Tetrachlorophenol		NAF
2,3,4,5-Tetrachlorophenol		NAF
Pentachlorophenol	**89**	%
Surrogate Recoveries		
2,4,6-Tribromophenol	**83**	%

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MANCHESTER ENVIRONMENTAL LABORATORY

7411 Beach Drive E, Port Orchard, Washington 98366

October 6, 1997

Subject: American Crossarm and Conduit

Samples: 97-378040 through 97-378046

Case No. 1526-97

Officer: Pam Marti

By: Karin Feddersen KF

Chlorinated Phenolics

ANALYTICAL METHODS:

These samples were analyzed following the Manchester modification of the SW 846 8151 procedure. No QA/QC samples were requested with the analyses. Blanks are performed with all Manchester Lab analyses.

HOLDING TIMES:

The sample was stored at 4 deg. C until extraction. Extraction was performed within 7 days of collection. All extracts were analyzed within the recommended holding time of 40 days from extraction.

BLANKS:

No target compounds were detected in any of the laboratory blanks.

SURROGATES:

2,4,6-Tribromophenol was added to the sample and blanks prior to extraction. All surrogate recoveries were acceptable.

MATRIX SPIKE AND MATRIX SPIKE DUPLICATE:

No spikes were requested.

ANALYTICAL COMMENTS:

2,3,4,6-Tribromophenol and 2,3,5,6-Tribromophenol co-elute on both analytical columns. The value reported for 2,3,4,6-Tribromophenol reflects both compounds.

The calibration coefficient for Pentachlorophenol is less than 0.995. Detected results for this analyte have been qualified as estimates, "J".

The data is acceptable for use as reported.

DATA QUALIFIER CODES:

U	-	The analyte was not detected at or above the reported value.
J	-	The analyte was positively identified. The associated numerical value is an estimate.
bold	-	The analyte was present in the sample. (Visual Aid to locate detected compound on report sheet.)

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Chlorophenoxy Herbicides

Project Name: American Crossarm & Conduit **LIMS Project ID:** 1526-97

Sample: 97378040
Field ID: MW-22
Project Officer: Pam Marti

Date Received: 09/10/97
Date Prepared: 09/11/97
Date Analyzed: 09/12/97

Method: SW8150
Matrix: Water
Units: ug/L

Analyte	Result	Qualifier
2,4,6-Trichlorophenol	0.003	U
2,4,5-Trichlorophenol	0.003	U
2,3,4,6-Tetrachlorophenol	0.003	U
2,3,4,5-Tetrachlorophenol	0.003	U
Pentachlorophenol	0.003	U

Surrogate Recoveries

2,4,6-Tribromophenol	**56**	**%**

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Manchester Environmental Laboratory

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Analysis Report for

Chlorophenoxy Herbicides

Project Name: American Crossarm & Conduit **LIMS Project ID:** 1526-97

Sample: 97378041 **Date Received:** 09/10/97 **Method:** SW8150
Field ID: MW-25 **Date Prepared:** 09/11/97 **Matrix:** Water
Project Officer: Pam Marti **Date Analyzed:** 09/12/97 **Units:** ug/L

Analyte	Result	Qualifier
2,4,6-Trichlorophenol	0.003	U
2,4,5-Trichlorophenol	0.003	U
2,3,4,6-Tetrachlorophenol	0.003	U
2,3,4,5-Tetrachlorophenol	0.003	U
Pentachlorophenol	0.003	U

Surrogate Recoveries

2,4,6-Tribromophenol	**135**	**%**

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Analysis Report for

Chlorophenoxy Herbicides

Project Name: American Crossarm & Conduit **LIMS Project ID:** 1526-97

Sample: 97378042
Field ID: ACCSW2
Project Officer: Pam Marti

Date Received: 09/10/97
Date Prepared: 09/11/97
Date Analyzed: 09/12/97

Method: SW8150
Matrix: Water
Units: ug/L

Analyte	Result	Qualifier
2,4,6-Trichlorophenol	0.003	U
2,4,5-Trichlorophenol	0.003	U
2,3,4,6-Tetrachlorophenol	**.004**	
2,3,4,5-Tetrachlorophenol	0.003	U
Pentachlorophenol	**0.005**	**J**

Surrogate Recoveries

2,4,6-Tribromophenol	**76**	**%**

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Chlorophenoxy Herbicides

Project Name: American Crossarm & Conduit **LIMS Project ID:** 1526-97

Sample: 97378043
Field ID: ACCSW1
Project Officer: Pam Marti

Date Received: 09/10/97
Date Prepared: 09/11/97
Date Analyzed: 09/12/97

Method: SW8150
Matrix: Water
Units: ug/L

Analyte	Result	Qualifier
2,4,6-Trichlorophenol	0.003	U
2,4,5-Trichlorophenol	0.003	U
2,3,4,6-Tetrachlorophenol	**0.008**	
2,3,4,5-Tetrachlorophenol	0.003	U
Pentachlorophenol	**0.007**	**J**

Surrogate Recoveries

2,4,6-Tribromophenol	**92**	**%**

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Chlorophenoxy Herbicides

Project Name: American Crossarm & Conduit **LIMS Project ID:** 1526-97

Sample: 97378044
Field ID: MW-23
Project Officer: Pam Marti

Date Received: 09/11/97
Date Prepared: 09/12/97
Date Analyzed: 09/12/97

Method: SW8150
Matrix: Water
Units: ug/L

Analyte	Result	Qualifier
2,4,6-Trichlorophenol	0.003	U
2,4,5-Trichlorophenol	0.003	U
2,3,4,6-Tetrachlorophenol	0.003	U
2,3,4,5-Tetrachlorophenol	0.003	U
Pentachlorophenol	0.003	U

Surrogate Recoveries

2,4,6-Tribromophenol	**77**	**%**

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Chlorophenoxy Herbicides

Project Name: American Crossarm & Conduit **LIMS Project ID:** 1526-97

Sample: 97378045 **Date Received:** 09/11/97 **Method:** SW8150
Field ID: MW-24 **Date Prepared:** 09/12/97 **Matrix:** Water
Project Officer: Pam Marti **Date Analyzed:** 09/12/97 **Units:** ug/L

Analyte	Result	Qualifier
2,4,6-Trichlorophenol	0.003	U
2,4,5-Trichlorophenol	0.003	U
2,3,4,6-Tetrachlorophenol	0.003	U
2,3,4,5-Tetrachlorophenol	0.003	U
Pentachlorophenol	0.003	U

Surrogate Recoveries

2,4,6-Tribromophenol	**72**	**%**

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Analysis Report for

Chlorophenoxy Herbicides

Project Name: American Crossarm & Conduit **LIMS Project ID:** 1526-97

Sample: 97378046 **Date Received:** 09/11/97 **Method:** SW8150
Field ID: MW-24A **Date Prepared:** 09/12/97 **Matrix:** Water
Project Officer: Pam Marti **Date Analyzed:** 09/12/97 **Units:** ug/L

Analyte	Result	Qualifier
2,4,6-Trichlorophenol	0.003	U
2,4,5-Trichlorophenol	0.003	U
2,3,4,6-Tetrachlorophenol	0.003	U
2,3,4,5-Tetrachlorophenol	0.003	U
Pentachlorophenol	0.003	U

Surrogate Recoveries

2,4,6-Tribromophenol	**70**	**%**

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Analysis Report for

Chlorophenoxy Herbicides

Project Name: American Crossarm & Conduit **LIMS Project ID:** 1526-97

Sample: BLN72667 **Method:** SW8150
Blank ID: 0BW7254A1 **Date Prepared:** 09/11/97 **Matrix:** Water
Project Officer: Pam Marti **Date Analyzed:** 09/12/97 **Units:** ug/L

Analyte	Result	Qualifier
2,4,6-Trichlorophenol	0.003	U
2,4,5-Trichlorophenol	0.003	U
2,3,4,6-Tetrachlorophenol	0.003	U
2,3,4,5-Tetrachlorophenol	0.003	U
Pentachlorophenol	0.003	U

Surrogate Recoveries

2,4,6-Tribromophenol	**70**	**%**

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Chlorophenoxy Herbicides

Project Name: American Crossarm & Conduit **LIMS Project ID:** 1526-97

Sample: BLN72668
Blank ID: OBW7254A2
Project Officer: Pam Marti

Date Prepared: 09/11/97
Date Analyzed: 09/12/97

Method: SW8150
Matrix: Water
Units: ug/L

Analyte	Result	Qualifier
2,4,6-Trichlorophenol	0.003	U
2,4,5-Trichlorophenol	0.003	U
2,3,4,6-Tetrachlorophenol	0.003	U
2,3,4,5-Tetrachlorophenol	0.003	U
Pentachlorophenol	0.003	U

Surrogate Recoveries

2,4,6-Tribromophenol	**161**	**%**

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Chlorophenoxy Herbicides

Project Name: American Crossarm & Conduit **LIMS Project ID:** 1526-97

Sample: BLN72666
Blank ID: OBW7255B2
Project Officer: Pam Marti

Date Prepared: 09/12/97
Date Analyzed: 09/12/97

Method: SW8150
Matrix: Water
Units: ug/L

Analyte	Result	Qualifier
2,4,6-Trichlorophenol	0.003	U
2,4,5-Trichlorophenol	0.003	U
2,3,4,6-Tetrachlorophenol	0.003	U
2,3,4,5-Tetrachlorophenol	0.003	U
Pentachlorophenol	0.003	U

Surrogate Recoveries

2,4,6-Tribromophenol	77	%

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Analysis Report for

Polyaromatic Hydrocarbons (PNA's)

Project Name: American Crossarm & Conduit **LIMS Project ID:** 1719-97

Sample: LCS73641 **Method:** SW8270
Blank ID: OFW7345 **Date Prepared:** 12/11/97 **Matrix:** Water
Project Officer: Pam Marti **Date Analyzed:** 12/22/97 **Units:** ug/L

Analyte	Result	Qualifier
Naphthalene	60	%
2-Methylnaphthalene	65	%
1-Methylnaphthalene	78	%
2-Chloronaphthalene		NAF
Acenaphthylene	70	%
Acenaphthene	63	%
Dibenzofuran	65	%
Fluorene	65	%
Phenanthrene	68	%
Anthracene	70	%
Fluoranthene	65	%
Pyrene	100	%
Retene	80	%
Benzo(a)anthracene	70	%
Chrysene	65	%
Benzo(b)fluoranthene	53	%
Benzo(k)fluoranthene	60	%
Benzo(a)pyrene	65	%
Indeno(1,2,3-cd)pyrene	93	%
Dibenzo(a,h)anthracene	100	%
Benzo(ghi)perylene	93	%

Surrogate Recoveries

2-Fluorobiphenyl	55	%
D10-Pyrene	70	%
D14-Terphenyl	80	%

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Analysis Report for

Polyaromatic Hydrocarbons (PNA's)

Project Name: American Crossarm & Conduit **LIMS Project ID:** 1719-97

Sample: BLN73640 **Method:** SW8270
Blank ID: OBS7345A2 **Date Prepared:** 12/11/97 **Matrix:** Water
Project Officer: Pam Marti **Date Analyzed:** 12/22/97 **Units:** ug/L

Analyte	Result	Qualifier
Naphthalene	**.0034**	**J**
2-Methylnaphthalene	**.0026**	**J**
1-Methylnaphthalene	**.0011**	**J**
2-Chloronaphthalene	.02	U
Acenaphthylene	.02	U
Acenaphthene	**.00058**	**J**
Dibenzofuran	**.00056**	**J**
Fluorene	**.00054**	**J**
Phenanthrene	**.0024**	**J**
Anthracene	.02	U
Fluoranthene	**.00091**	**J**
Pyrene	**.00049**	**J**
Retene	.02	U
Benzo(a)anthracene	.02	U
Chrysene	.02	U
Benzo(b)fluoranthene	.02	U
Benzo(k)fluoranthene	.02	U
Benzo(a)pyrene	.02	U
Indeno(1,2,3-cd)pyrene	.02	U
Dibenzo(a,h)anthracene	.02	U
Benzo(ghi)perylene	.02	U

Surrogate Recoveries

2-Fluorobiphenyl	**55**	**%**
D10-Pyrene	**58**	**%**
D14-Terphenyl	**65**	**%**

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Analysis Report for

Polyaromatic Hydrocarbons (PNA's)

Project Name: American Crossarm & Conduit **LIMS Project ID:** 1719-97

Sample: BLN73639
Blank ID: OBS7345A1
Project Officer: Pam Marti
Date Prepared: 12/11/97
Date Analyzed: 12/22/97
Method: SW8270
Matrix: Water
Units: ug/L

Analyte	Result	Qualifier
Naphthalene	**.0058**	**J**
2-Methylnaphthalene	**.0073**	**J**
1-Methylnaphthalene	**.0025**	**J**
2-Chloronaphthalene	.02	U
Acenaphthylene	.02	U
Acenaphthene	**.0016**	**J**
Dibenzofuran	**.0057**	**J**
Fluorene	**.0034**	**J**
Phenanthrene	**.0053**	**J**
Anthracene	.02	U
Fluoranthene	**.00093**	**J**
Pyrene	**.00045**	**J**
Retene	.02	U
Benzo(a)anthracene	.02	U
Chrysene	.02	U
Benzo(b)fluoranthene	.02	U
Benzo(k)fluoranthene	.02	U
Benzo(a)pyrene	.02	U
Indeno(1,2,3-cd)pyrene	.02	U
Dibenzo(a,h)anthracene	.02	U
Benzo(ghi)perylene	.02	U

Surrogate Recoveries

2-Fluorobiphenyl	**55**	**%**
D10-Pyrene	**55**	**%**
D14-Terphenyl	**65**	**%**

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Polyaromatic Hydrocarbons (PNA's)

Project Name: American Crossarm & Conduit **LIMS Project ID:** 1719-97

Sample: 97508036 **Date Received:** 12/11/97 **Method:** SW8270
Field ID: ACCSW2 **Date Prepared:** 12/11/97 **Matrix:** Water
Project Officer: Pam Marti **Date Analyzed:** 12/22/97 **Units:** ug/L

Analyte	Result	Qualifier
Naphthalene	**.12**	
2-Methylnaphthalene	**.035**	
1-Methylnaphthalene	**.043**	
2-Chloronaphthalene	.0065	U
Acenaphthylene	**.0053**	**J**
Acenaphthene	**.11**	
Dibenzofuran	**.026**	
Fluorene	**.051**	
Phenanthrene	**.024**	
Anthracene	**.029**	
Fluoranthene	**.031**	
Pyrene	**.021**	
Retene	**.0024**	**J**
Benzo(a)anthracene	**.0029**	**J**
Chrysene	**.0037**	**J**
Benzo(b)fluoranthene	**.0031**	**J**
Benzo(k)fluoranthene	**.0011**	**J**
Benzo(a)pyrene	**.0018**	**J**
Indeno(1,2,3-cd)pyrene	**.0012**	**J**
Dibenzo(a,h)anthracene	.0065	U
Benzo(ghi)perylene	**.0016**	**J**

Surrogate Recoveries

2-Fluorobiphenyl	52	%
D10-Pyrene	58	%
D14-Terphenyl	62	%

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Polyaromatic Hydrocarbons (PNA's)

Project Name: American Crossarm & Conduit **LIMS Project ID:** 1719-97

Sample: 97508035
Field ID: ACCSW1
Project Officer: Pam Marti

Date Received: 12/11/97
Date Prepared: 12/11/97
Date Analyzed: 12/22/97

Method: SW8270
Matrix: Water
Units: ug/L

Analyte	Result	Qualifier
Naphthalene	**.29**	
2-Methylnaphthalene	**.14**	
1-Methylnaphthalene	**.16**	
2-Chloronaphthalene	.0064	U
Acenaphthylene	**.013**	
Acenaphthene	**.4**	
Dibenzofuran	**.1**	
Fluorene	**.18**	
Phenanthrene	**.065**	
Anthracene	**.11**	
Fluoranthene	**.23**	
Pyrene	**.16**	
Retene	**.017**	
Benzo(a)anthracene	**.021**	
Chrysene	**.031**	
Benzo(b)fluoranthene	**.018**	**J**
Benzo(k)fluoranthene	**.0064**	**J**
Benzo(a)pyrene	**.013**	
Indeno(1,2,3-cd)pyrene	**.0073**	
Dibenzo(a,h)anthracene	**.0012**	**J**
Benzo(ghi)perylene	**.007**	

Surrogate Recoveries

2-Fluorobiphenyl	**50**	**%**
D10-Pyrene	**55**	**%**
D14-Terphenyl	**60**	**%**

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Polyaromatic Hydrocarbons (PNA's)

Project Name: American Crossarm & Conduit **LIMS Project ID:** 1719-97

Sample: 97508034
Field ID: MW-24A
Project Officer: Pam Marti

Date Received: 12/11/97
Date Prepared: 12/11/97
Date Analyzed: 12/22/97

Method: SW8270
Matrix: Water
Units: ug/L

Analyte	Result	Qualifier
Naphthalene	.0064	U
2-Methylnaphthalene	.0064	U
1-Methylnaphthalene	.0064	U
2-Chloronaphthalene	.0064	U
Acenaphthylene	.0064	U
Acenaphthene	.0064	U
Dibenzofuran	.0064	U
Fluorene	.0064	U
Phenanthrene	.0064	U
Anthracene	.0064	U
Fluoranthene	.0064	U
Pyrene	.013	U
Retene	.0064	U
Benzo(a)anthracene	.0064	U
Chrysene	.0064	U
Benzo(b)fluoranthene	.0064	U
Benzo(k)fluoranthene	.0064	U
Benzo(a)pyrene	.0064	U
Indeno(1,2,3-cd)pyrene	.0064	U
Dibenzo(a,h)anthracene	.0064	U
Benzo(ghi)perylene	.0064	U

Surrogate Recoveries

2-Fluorobiphenyl	**55**	**%**
D10-Pyrene	**55**	**%**
D14-Terphenyl	**65**	**%**

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Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Polyaromatic Hydrocarbons (PNA's)

Project Name: American Crossarm & Conduit **LIMS Project ID:** 1719-97

Sample: 97508033
Field ID: MW-24
Project Officer: Pam Marti

Date Received: 12/11/97
Date Prepared: 12/11/97
Date Analyzed: 12/22/97

Method: SW8270
Matrix: Water
Units: ug/L

Analyte	Result	Qualifier
Naphthalene	.0067	U
2-Methylnaphthalene	.0067	U
1-Methylnaphthalene	.0067	U
2-Chloronaphthalene	.0067	U
Acenaphthylene	.0067	U
Acenaphthene	.0067	U
Dibenzofuran	.0067	U
Fluorene	.0067	U
Phenanthrene	.0067	U
Anthracene	.0067	U
Fluoranthene	.0067	U
Pyrene	.013	U
Retene	.0067	U
Benzo(a)anthracene	.0067	U
Chrysene	.0067	U
Benzo(b)fluoranthene	.0067	U
Benzo(k)fluoranthene	.0067	U
Benzo(a)pyrene	.0067	U
Indeno(1,2,3-cd)pyrene	.0067	U
Dibenzo(a,h)anthracene	.0067	U
Benzo(ghi)perylene	.0067	U

Surrogate Recoveries

2-Fluorobiphenyl	**55**	%
D10-Pyrene	**55**	%
D14-Terphenyl	**65**	%

Authorized By: _____ Release Date: 1/6/98

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Polyaromatic Hydrocarbons (PNA's)

Project Name: American Crossarm & Conduit **LIMS Project ID:** 1719-97

Sample: 97508032
Field ID: MW-23
Project Officer: Pam Marti

Date Received: 12/11/97
Date Prepared: 12/11/97
Date Analyzed: 12/22/97

Method: SW8270
Matrix: Water
Units: ug/L

Analyte	Result	Qualifier
Naphthalene	**.014**	
2-Methylnaphthalene	.0064	U
1-Methylnaphthalene	.0064	U
2-Chloronaphthalene	.0064	U
Acenaphthylene	**.00056**	**J**
Acenaphthene	.0064	U
Dibenzofuran	.0064	U
Fluorene	.0064	U
Phenanthrene	.0064	U
Anthracene	.0064	U
Fluoranthene	.0064	U
Pyrene	.013	U
Retene	.0064	U
Benzo(a)anthracene	.0064	U
Chrysene	.0064	U
Benzo(b)fluoranthene	.0064	U
Benzo(k)fluoranthene	.0064	U
Benzo(a)pyrene	.0064	U
Indeno(1,2,3-cd)pyrene	.0064	U
Dibenzo(a,h)anthracene	.0064	U
Benzo(ghi)perylene	.0064	U

Surrogate Recoveries

2-Fluorobiphenyl	**52**	**%**
D10-Pyrene	**52**	**%**
D14-Terphenyl	**62**	**%**

Authorized By: _____ Release Date: 1/6/98

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Polyaromatic Hydrocarbons (PNA's)

Project Name: American Crossarm & Conduit **LIMS Project ID:** 1719-97

Sample: 97508031
Field ID: MW-25
Project Officer: Pam Marti

Date Received: 12/11/97
Date Prepared: 12/11/97
Date Analyzed: 12/22/97

Method: SW8270
Matrix: Water
Units: ug/L

Analyte	Result	Qualifier
Naphthalene	**.01**	
2-Methylnaphthalene	.0063	U
1-Methylnaphthalene	.0063	U
2-Chloronaphthalene	.0063	U
Acenaphthylene	.0063	U
Acenaphthene	.0063	U
Dibenzofuran	.0063	U
Fluorene	.0063	U
Phenanthrene	.0063	U
Anthracene	.0063	U
Fluoranthene	.0063	U
Pyrene	.013	U
Retene	.0063	U
Benzo(a)anthracene	.0063	U
Chrysene	.0063	U
Benzo(b)fluoranthene	.0063	U
Benzo(k)fluoranthene	.0063	U
Benzo(a)pyrene	.0063	U
Indeno(1,2,3-cd)pyrene	.0063	U
Dibenzo(a,h)anthracene	.0063	U
Benzo(ghi)perylene	.0063	U

Surrogate Recoveries

2-Fluorobiphenyl	**55**	%
D10-Pyrene	**55**	%
D14-Terphenyl	**65**	%

Authorized By: _____ Release Date: 1/6/98

Manchester Environmental Laboratory

Department of Ecology

Analysis Report for

Polyaromatic Hydrocarbons (PNA's)

Project Name: American Crossarm & Conduit **LIMS Project ID:** 1719-97

Sample: 97508030 **Date Received:** 12/11/97 **Method:** SW8270
Field ID: MW-22 **Date Prepared:** 12/11/97 **Matrix:** Water
Project Officer: Pam Marti **Date Analyzed:** 12/22/97 **Units:** ug/L

Analyte	Result	Qualifier
Naphthalene	.0071	U
2-Methylnaphthalene	.0066	U
1-Methylnaphthalene	.0066	U
2-Chloronaphthalene	.0066	U
Acenaphthylene	.0066	U
Acenaphthene	.0066	U
Dibenzofuran	.0066	U
Fluorene	.0066	U
Phenanthrene	.0066	U
Anthracene	.0066	U
Fluoranthene	.0066	U
Pyrene	.013	U
Retene	.0066	U
Benzo(a)anthracene	.0066	U
Chrysene	.0066	U
Benzo(b)fluoranthene	.0066	U
Benzo(k)fluoranthene	.0066	U
Benzo(a)pyrene	.0066	U
Indeno(1,2,3-cd)pyrene	.0066	U
Dibenzo(a,h)anthracene	.0066	U
Benzo(ghi)perylene	.0066	U

Surrogate Recoveries

2-Fluorobiphenyl	52	%
D10-Pyrene	55	%
D14-Terphenyl	65	%

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SUMMARY:

Benzo(b)fluoranthene and Benzo(k)fluoranthene co-elute and are therefore difficult to quantitate separately. Detected results for these analytes have been qualified as estimates.

The data is acceptable for use as reported.

DATA QUALIFIER CODES:

U	-	The analyte was not detected at or above the reported value.
J	-	The analyte was positively identified. The associated numerical value is an estimate.
UJ	-	The analyte was not detected at or above the reported estimated result.
REJ	-	The data are unusable for all purposes.
NAF	-	Not analyzed for.
N	-	There is evidence the analyte is present in this sample.
NJ	-	There is evidence that the analyte is present. The associated numerical result is an estimate.
E	-	This qualifier is used when the concentration of the associated value exceeds the known calibration range.
bold	-	The analyte was present in the sample. (Visual Aid to locate detected compound on report sheet.)

MANCHESTER ENVIRONMENTAL LABORATORY
7411 Beach Drive E , Port Orchard Washington 98366

December 31, 1997

Subject: **American Crossarm**

Samples: 97508030 through 97508036

Case No. 1719-97

Officer: Pam Marti

By: Karin Feddersen KF

SEMIVOLATILE ORGANICS
Polynuclear Aromatic Hydrocarbons

ANALYTICAL METHODS:

The samples were extracted following the Manchester modification of the EPA SW 846 8270 procedure with capillary GC/MS analysis of the sample extracts. Routine QA/QC procedures were performed with the analyses.

HOLDING TIMES:

All sample and extraction holding times were within the recommended limits.

BLANKS:

Low levels of some target analytes were detected in the laboratory blanks. An analyte is considered native to the sample when the concentration is at least five times that present in the associated method blanks.

SURROGATES:

The primary surrogates for PAH analyses with silica gel cleanup are D10-Pyrene and D14-Terphenyl. 2-Fluorobiphenyl recoveries better reflect the more volatile PAH's, such as the Naphthalenes. All surrogate spike recoveries were within acceptable QC limits.

BLANK SPIKE:

A fortified blank was performed with this analysis to evaluate data precision. The results have been included for your information. All recoveries were above 50%.